HOYLE TANNER

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July 20, 2023

NHDES Water Division
Groundwater Discharge Permit Coordinator
Drinking Water & Groundwater Bureau
PO Box 95
Concord, NH 03302-0095

Re: Renewal of Groundwater Discharge Permit (DES# 198704058-N-006)
Mount Sunapee Resort, Newbury, New Hampshire

Dear Groundwater Discharge Permit Coordinator:

The Vail Corporation, as the Facility Operator of the Sunapee Difference L.L.C. D.B.A Mt Sunapee Resort, and the State of NH - Department of Natural and Cultural Resources (NCR), as the Facility Owner, submit the following information for the renewal of the Mount Sunapee WWTF - Groundwater Discharge Permit, DES# 198704058-N-006.

Application Information

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D. Mount Sunapee Resort Spray Irrigation Operations Observations Letter dated July 17, 2023, from Hoyle Tanner Site Visit on June 19, 2023.

As you requested in your June 27, 2023 email correspondence to Joseph Ducharme of Hoyle, Tanner & Associates, Inc., submittal of redundant information has been avoided. Please refer to NH DES files regarding the following information related to the NH Department of Environmental Services Application for Groundwater Discharge Permit renewal:

1. Current NHDES — Groundwater Discharge Permit No. GWP-198704058-N-006
2. Lease & Operating Agreement
3. Groundwater monitoring wells sampling data monthly reports
4. Secondary treated effluent spray sampling data monthly reports

Mount Sunapee Resort currently has one individual employed as a certified Wastewater Treatment Facility Operator - Grade 1 by the State of New Hampshire, Kris DuBaere.

The primary contact person at Mount Sunapee Resort for the Department of Environmental Services - Water Division/Drinking Water Bureau, Groundwater Recharge Program for this permit and matters pertaining to the lagoon and spray fields is Kris DuBaere, Facility Operator.

No substantive changes to the overall permitted system have occurred since the spring of 2018. Minor work has been done such as replacing the Spruce Lodge septic tank and adding two new septic tanks for employee use only. The Vehicle Maintenance Shop and Lift Maintenance Shop were recently upgraded to include restrooms for employees. Two wells were drilled, and two septic systems were installed. The upgrades have not increased flow to the system, as the number of employees has not increased. Employees previously used the restroom facilities at another building.

Per the Flood Insurance Program, FIRM Flood Insurance Rate Map, Merrimack County, New Hampshire, Panel 230 of 705, Map Number 33013C0230E, effective April 19, 2010, and FIRM Flood Insurance Rate Map, Sullivan County, New Hampshire, Panel 330 of 445, Map Number 33019C0330E, effective May 23, 2006, there is no 100-year flood zone within 1,000’ of the permitted groundwater discharge zone.

Current Utilization & Future Capacity Needs

Hoyle, Tanner has provided wastewater engineering services for Mount Sunapee’s lagoons and spray fields for over 25 years, and they have assisted with the GWP renewal application in 2003, 2008, 2013, 2018, and now again in 2023.

As part of the 2023 renewal effort, Mount Sunapee provided Hoyle, Tanner with daily wastewater flows into the lagoons as recorded through the v-notch weir. The users consist of winter sports enthusiasts, full time employees, and part time employees, the numbers of which vary from ski season to ski season. On average, Mount Sunapee expects to have around 250,000 annual skiers, 90 full time winter employees, and 60,000 summer visitors. These numbers are not greatly different from the numbers seen during the previous permit renewal period.

The following buildings contribute flow to the septic system: Sunapee Lodge, Learning Center, NESHA, Snowmaking Building, Competition Center, Ski Patrol, Spruce Lodge, Goosefeathers Pub, Vehicle Maintenance Shop, and the Lift Maintenance Shop. The flow from Sunapee Lodge, Spruce Lodge, and Goosefeathers Pub is a combination of kitchen flow and restroom flow. The kitchens are reportedly equipped with grease traps. Other buildings contribute domestic (restroom) flow only.

In the 2018 renewal application, Hoyle Tanner estimated the annual spray area capacity used from 2018 to 2023 would be in the range of 59-79% of the total spray area capacity. The lower range value was based on an anticipated maximum of 340,000 annual visitors, at an average 4.15 gallons of lagoon effluent per visitor, and an average annual contribution of 2,099,572 meteorological gallons. This would result in a total estimated annual volume of 3,510,572 gallons of sprayed effluent, or 59% of the total spray area capacity. The higher range value was based on an anticipated maximum of 340,000 total annual visitors, and a maximum of 5.62 gallons of lagoon effluent per visitor, and a maximum of 2,817,464 meteorological gallons. This would result in a total estimated annual volume of 4,728,264 gallons sprayed effluent, or 79% of the total spray area capacity.

As shown in Table 1 below, the average lagoon influent and effluent flows have decreased since the last permit renewal. Based upon recent years' lagoon effluent volume and anticipated future visitor levels, it is anticipated that the lagoons and spray fields have adequate capacity to meet the current level of visitors and the foreseeable future levels of visitors expected at Mount Sunapee Resort.

Table 1. Annual Lagoon Influent and Effluent Flow

Year	Lagoon Influent (gal)	Lagoon Effluent (gal)	Meteorological Flow (gal)
2013	1,194,183	3,602,900	2,408,717
2014	1,305,534	4,123,000	2,817,466
2015	1,314,823	3,170,400	1,855,577
2016	1,050,475	1,712,300	661,825
2017	1,031,221	3,785,500	2,754,279
Average 2013-2017	**1,196,076**	**3,278,820**	**2,099,573**
2018	978,103	3,302,500	2,324,397
2019	900,487	3,054,900	2,154,413
2020	861,226	2,307,400	1,446,174
2021	789,500	3,447,000	2,657,500
2022	882,914	3,140,500	2,317,586
Average 2020-2022	**870,446**	**3,050,460**	**2,180,014**

Future development plans can be found in the Mount Sunapee Five-Year Master Development Plan (2020-2025) and the Mount Sunapee Five-Year Environmental Management Plan (2020-2025). The documents

only serve as a roadmap for future planning. More detailed planning would be required for these projects to be implemented. The plans propose Base Area expansion, which has potential to add flow to the current wastewater system, and the West Bowl expansion, which would require its own wastewater system.

The only major development project being considered past 2028 is snow tubing, which would utilize existing terrain and facilities. At the time of this renewal and the Engineer's site visit, Hoyle Tanner had not been informed of any definitive planned development projects though 2028 that would increase flow to the lagoons.

Hoyle Tanner was asked to review a site plan set titled *Vail Resorts, Mount Sunapee Resort, Parking Lot Expansion, Newbury NH*, dated March 2023, and responded with a letter of observations that can be found in Appendix D of this permit renewal package. Mount Sunapee is currently in the permitting process for the proposed new parking lot at the resort that requires both an Alteration of Terrain permit and a Wetlands Dredge and Fill permit. The new parking lot will be located between the spray fields and Mt Sunapee Road. Hoyle Tanner reviewed the site plans by the design Engineer and offered observations and comments to Mount Sunapee. When the mountain is busy, the three parking lots are at capacity and visitors often park along Mt Sunapee Road. We understand from Mount Sunapee staff that this parking lot would not necessarily attract more skiers, just allow for safer off-road parking, and therefore is not expected to increase flow to the wastewater system.

Summary

In summary, the lagoons and spray fields appear to be adequately maintained and functioning reliably for Mount Sunapee Resort.

A review of the groundwater well monitoring data and the spray fields sampling shows that the lagoons and spray fields are not operating in full compliance with the current permit. The permit requires three types of monitoring, surface water monitoring, groundwater monitoring, and effluent monitoring. There were no instances of non-compliance or violations observed pertaining to surface water monitoring or groundwater monitoring. However, there were periodic exceedances of the recommended levels in the spray effluent for Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS) over the 5-year permit period. Lagoon effluent samples are taken at the spray irrigation pump building prior to discharge. The system is not designed to treat BOD_5 or TSS and the above-stated permit exceedances are not due to maloperation. The lagoons are regularly covered with duckweed and contain algae blooms, which could contribute to the TSS levels in the effluent. The presence of duckweed and algae is also likely to impede breakdown of the wastewater and would result in higher levels of BOD_5. The analytical reports for this year were reviewed, and the effluent samples taken in May and June are in compliance with the permit limits.

Hoyle Tanner's review of the capacity of the spray fields indicates that the total available spray area capacity is sufficient for Mount Sunapee Resort's current and future needs (acknowledging no major expansion plans were identified by the Resort through the next GWDP renewal in 2028).

Please refer also to the attached letter dated July 20, 2023 from Joseph Ducharme, PE, BCEE, with subject Review of Mount Sunapee Resort Wastewater Treatment System.

Should you require additional information, please contact me at (603) 460-5160 or via email at jducharme@hoyletanner.com.

Sincerely,
Hoyle, Tanner & Associates, Inc.

Joseph Ducharme, Jr., PE, BCEE
Senior Vice President / Division Manager-Municipal Engineering Services

Enclosure(s)

cc: Ms. Maura Mancini - Vail Resorts Management Company
Mr. Kris DuBaere - Vail Reports Management Company
Town Clerk - Town of Newbury, NH

GROUNDWATER DISCHARGE PERMIT FORM

Drinking Water and Groundwater Bureau
Groundwater Discharge Program

RSA/Rule: RSA 485-A:6, VII; 485:3, X; Env-Wq 402

The GROUNDWATER DISCHARGE PERMIT is a permit issued under RSA 485-A:13 and Env-Wq 402 for the discharge of wastewater to the ground or groundwater. Examples of facilities needing a groundwater discharge permit include rapid infiltration basins, unlined wastewater, septage and sludge lagoons, septic systems not meeting applicable nitrate setback requirements, spray irrigation using treated wastewater, and facilities discharging wastewater containing regulated contaminants that are treated with Best Available Technology.

SUBMIT

- ☒ ONE SIGNED AND COMPLETED APPLICATION (Applicant shall provide a copy to town/city clerk).
- ☒ SUPPORTING INFORMATION.
- ☒ $1,000 APPLICATION FEE (in the form of a check payable to the "Treasurer-State of NH." (State and local government including counties and political subdivisions are exempt.)

TO: NHDES Water Division
Groundwater Discharge Permit Coordinator
Drinking Water & Groundwater Bureau
P.O. Box 95
Concord, NH 03302-0095

If you have any questions, please contact the Groundwater Discharge Permit Coordinator at (603) 271-2858.

FOR STATE USE ONLY

Date Received:_____

Site No: _____

Rivers Coordinator Notified Date: _____

CERTIFICATION OF NOTICE TO LOCAL TOWN/CITY CLERK

In order to meet the requirements of Env-Wq 402.16(b), the undersigned certifies that on 7/28/2023 (date) a copy of this completed permit application was given to the Town/City Clerk of Newbury, NH (the town in which the facility for which a permit is needed or is proposed to be located).

Date: 7/28/2023 Signed: _____
(Applicant)

I. Activity Type

- ☒ Discharge from an unlined domestic wastewater lagoon.
- ☐ Discharge from an unlined septage or sludge lagoon.
- ☐ Land application of domestic wastewater.
- ☐ Discharge of domestic wastewater from a subsurface disposal system with a design flow equal to or greater than 20,000 gallons per day.
- ☐ Discharge of domestic wastewater from subsurface disposal systems with aggregate design flows equal to or greater than 1,000 gpd for a single lot where minimum nitrate setback distances are not met.
- ☐ Discharge of nondomestic wastewater which contains a regulated contaminant and which has received treatment by Best Available Technologies before discharge.

II. Applicant Information

Name: Vail Resorts Management Company	Daytime Phone: (970) 754-0005	
Mailing Address: 390 Interlocken Crescent		
City: Broomfield	State: CO	ZIP: 80021
Contact Person Name: Maura Mancini	Email: maura.k.mancini@vailresorts.com	
Contact Person Phone Number: (914) 473-0648	Fax Number:	

III. Facility Information

Name: The Sunapee Difference LLC, DBA, Mt. Sunapee Resort		
Address: 1398 New Hampshire Route 103		
City: Newbury	State: NH	ZIP: 03255
Property Tax Map: Map 13	Lot Number: 386, 092	
Latitude & Longitude of discharge point(s):		
Deed Reference (if applicable): County	Book and Page:	

IV. Facility Owner (complete only if different then Applicant)

Owner Name: Same as Applicant	Daytime Phone:	
Mailing Address:		
City/Town:	State:	ZIP:
Contact Person Name:	Email:	
Contact Person Phone Number:	Fax Number:	

V Property Owner (complete only if different then Applicant)

Name: State of New Hampshire	Daytime Phone: 603-271-3556	
Mailing Address: PO Box 1856, 172 Pembroke Road		
City: Concord	State: NH	ZIP: 03302
Contact Person Name:	Email:	
Contact Person Phone Number:	Fax Number:	

[*NOTE: The permit shall be obtained by the property owner unless a deeded easement, for a minimum of 20 years, has been granted by the property owner to the applicant for exclusive use of the groundwater as a receiving medium for discharged wastewater.]

VI. Facility Operator (complete only if different from facility owner)

Facility Operator Name: Same as Applicant	Daytime Phone:	
Mailing Address:		
City:	State:	ZIP:

VII. Facility Activity Information

Briefly describe the facility, its intended capacity and types of waste or wastewater handled, together with supporting information describing the process involved in the pretreatment, treatment, storage or disposal of the waste or wastewater (attach additional sheets as necessary).

Wastewater disposal at Mount Sunapee Resort is permitted by #GWP-189704058-N-006 issued on June 13, 2018. The spray system is permitted for 2 inches per week, or 250,000 gallons per week of secondary treated wastewater from stabilization/storage ponds. The current permit expired June 12, 2023.

VIII. Discharge

A. Type of discharge (primary or secondary domestic wastewater effluent, septage, etc.). Attach analytical results, if available:

Volume of discharge (GPD): See monthly reports submitted to NHDES	Septage (GPY): 0
Proposed Discharge Schedule: Up to 2 inches per week.	
Total number of designed discharge points (i.e. leachfield, dry wells): 3 lines with 14 spray heads each.	
Latitude & Longitude of all Discharge Points: See attached latitude and Longitude discharge map.	
Hydraulic loading rate(s) (attach calculations, if applicable): N/A	
Estimated construction time and projected start-up date (for new facilities only): N/A	

B. In the case of industries, all pertinent information relating to processes, production and associated waste streams and treatment shall be included with this application. N/A

IX. Supporting Information

Use this check list as a guide to submitting all needed information, check "Y" (Yes), or "NA" (Not Applicable). If your activity is not directly described, submittal requirements will be determined on a case-by-case basis. If you check "NA" in the following checklist, please submit a comprehensive narrative of the activities to be permitted.

Y	N/A	
☒	☐	A. An original or color photocopy of a USGS map (7½ minute series if available) which clearly identifies the facility location or a map that depicts equivalent features at a similar scale.
☒	☐	B. For discharges of domestic wastewater, a groundwater discharge zone map, using a tax map as a base, which identifies and locates the following:
☐	☒	1. Groundwater discharge zone boundary;
☐	☒	2. Deeded easements which restrict the use of the groundwater;
☒	☐	3. Streets within 1,000 feet of the groundwater discharge zone;
☒	☐	4. Properties (including tax map and lot, ownership and land use information) within 1,000 feet of the groundwater discharge zone;
☐	☒	5. Surface water bodies within 1,000 feet of the groundwater discharge zone including their designated river classification;
☐	☒	6. Boundary of the 100-year flood zone and identification of the 100-year base flood elevation if within 1,000 feet of the discharge area;
☒	☐	7. Water supply sources (including type of use) within 1,000 feet of the groundwater discharge zone; and
☐	☒	8. Source water protection areas within 1,000 feet of the groundwater discharge zone.
		C. Detailed scaled facility plan prepared in accordance with the following:
☒	☐	1. The plan shall include a title, a legend and a true north arrow;
☒	☐	2. The plan shall be drawn to scale and the scale shall be noted on the plan and include a graphic scale bar;
☒	☐	3. The base plan sources from which the facility plan was derived shall be noted on the plan;
☒	☐	4. The location, elevation and datum of a bench mark shall be included. If a bench mark referenced to the National Geodetic Vertical Datum (NGVD) is within 1,000 feet of the facility, the elevation shall be recorded using NGVD, and the source of the NGVD bench mark information shall be noted on the plan;
☒	☐	5. Ground surface spot elevations and appropriate contours shall be shown.
☒	☐	6. The facility plan shall identify and locate the following:
☒	☐	a. Wastewater application and unlined lagoon areas including total land area available and area to be used;
☒	☐	b. Existing/proposed groundwater monitoring wells/piezometers that will be monitored;
☒	☐	c. Surface water sampling points;

☐	☒	d. Groundwater contours within 100 feet of the groundwater discharge zone;
☐	☒	e. Surface water bodies within 100 feet of the groundwater discharge zone;

Y	N/A	
☐	☒	f. Deeded easements which restrict the use of groundwater;
☐	☒	g. Groundwater discharge zone boundaries;
☐	☒	h. Land surface contours within 100 feet of the groundwater discharge zone;
☒	☐	i. A table of groundwater elevations from monitoring wells and piezometers used to develop the groundwater contours and/or used to develop groundwater contours and estimate mounding;
☐	☒	j. Soil borings and test pits within 100 feet of the groundwater discharge zone;
☒	☐	k. Physical structures and buildings associated with the facility;
☒	☐	l. Surface and underground storage tanks associated with the facility;
☒	☐	m. Underground utilities at the facility; and
☒	☐	n. Subsurface drains at the facility.
☐	☒	7. All plans and specifications shall be dated, signed, and sealed by the engineer of record, as that term is defined in RSA 310-A:2, III.
☒	☐	D. In addition to the facility plan, a copy of the plan scaled to fit on an 8½" x 11" or 11" x 17" sheet and modified to make the items in Part IX (C) above legible.
☒	☐	E. For existing facilities, a table summarizing all monitoring results from the existing monitoring points from 5 years previous to application date.
☐	☒	F. A list of reports on land use history, activities, water quality and hydrogeology associated with the property on which the facility is located.
☐	☒	G. A detailed proposal for a water quality monitoring program, including proposed monitoring schedule, parameters to be analyzed and monitoring locations, with supporting information justifying the locations, frequency and parameters selected.
☒	☐	H. A ~~table~~ plan of locational coordinates for monitoring wells and surface water quality points that are proposed in the water quality monitoring program for the facility, referenced to North American datum of 1983 (NAD83) or world geodetic systems of 1984 (WGS84) in degrees-minutes-seconds, decimal degrees or equivalent state plane coordinate units.
☐	☒	I. A nitrate migration study for domestic wastewater or a regulated contaminant movement study for a discharge of other than domestic wastewater.
☐	☒	J. For a new discharge site or an existing discharge site that is being expanded:
☐	☒	1. A site specific soil map of the proposed groundwater discharge zone prepared in accordance with the site specific soil mapping standards for New Hampshire and Vermont; and
☐	☒	2. A hydrogeologic site assessment and study that includes a description of the geology of the site, including a description of surficial geologic materials and thickness, estimates of hydraulic conductivity, hydraulic gradients, seepage velocity, groundwater flow, ambient groundwater quality, estimated infiltration rates, and intended loading rates; and
☐	☒	3. All supporting site specific data, documentation and calculation to support the estimates and descriptions provided.
☐	☒	K. Verification from the Department of Resources & Economic Development that no presence of threatened or endangered species exists on the site.
☐	☒	L. Test pit data and boring log data as outlined and in accordance with Env-Wq 402.15 (d) (1)-(3) including textural description, drilling methods, blow counts and water table observation.
☐	☒	M. Well construction details of existing monitoring wells, top of well casing elevations, measured depth to water table from top of casing.
☐	☒	N. Documentation, filed in the registry of deeds, which acknowledges that the use of groundwater within the groundwater discharge zone for drinking water wells shall be restricted by easement ownership rights, (if the applicant does not own all applicable land).
☐	☒	O. Status of Division approval of design plans and operations manual for the wastewater treatment system.
☒	☐	P. If a certified wastewater treatment plant operator is required under RSA 485-A, a copy of the certification or status or the operator/applicant.

☐ ☒ Q. A copy of the permit, or application if a permit is not yet issued, for:
☐ ☒ 1. A site specific permit for drainage and erosion control measures;
☐ ☒ 2. A septage or sludge management permit; and
☐ ☒ 3. A dam permit for bermed or dammed structures.

X. Permit Issuance Information

A. Within 90 days from the receipt of a complete permit application the New Hampshire Department of Environmental Services (the department) shall issue a permit for a period of five years subject to renewal or deny the application. The department shall notify the applicant of its decision in writing.

B. The department shall place conditions upon a groundwater discharge permit as required to assure conformance with these rules.

C. The department may enter any permitted facility for the purpose of collecting information, examining records, collecting samples or undertaking other action associated with the permit.

D. The permittee shall submit to the department before facility start-up, an as-built site plan on an 8½" x 11" or 11" x 17" sheet, boring logs and well construction details of wells installed after permit issuance.

E. The permittee shall submit one complete set of water quality results to the department before facility start-up.

F. The permittee shall apply for the renewal of the permit 90 days prior to its expiration date. The permittee shall continue to comply with all conditions in the original permit until permit renewal or facility closure. (See Env-Wq 402.28 for renewal criteria and Env-Wq 800 for closure requirements).

G. A permittee may request a permit modification or permit termination by submitting a written request to the department, including the reasons for the modification or termination and a table (in a format prescribed by the department) summarizing all monitoring results to date from existing monitoring points. The department shall modify or terminate the permit or deny the request, stating the reasons for the denial in writing, within 90 days of receipt of the request. (See Env-Wq 402.29 for further information).

H. Prior to transfer of ownership of a facility, the permittee shall file a written request with the department for a transfer of the permit to the new owner. The request shall include a summary of all monitoring results to date in a format prescribed by the department. Within 90 days of receiving a request for transfer, the department shall notify the present permittee and the new permittee of its decision in writing. Within 90 days from the date of approval of transfer, the new permittee shall notify the department in writing of its acceptance of the permit. (See Env-Wq 402.30 for further information).

XI. Applicant/Owner Certification Statement and Signature

By signing this application the signer certifies that the information contained in or otherwise submitted with this application is true, complete and not misleading to the best of the signer's knowledge and belief.

By signing this application, the signer understands that submission of false, incomplete or misleading information is grounds for:
- Denying the application;
- Revoking any application that is granted based on the information; and
- If the signer is acting as, or on behalf of, a listed engineer as defined in Env-C 502.10, debarring the listed engineer from the roster.

By signing the application, the signer and applicant agree to comply with all applicable rules and conditions of this permit and to not discharge to the holding tank(s) until written permission from the department has been received.

Peter F. Dirk — 7/28/2023

Signature of Facility Owner or Agent — Date

No liability is incurred by the State by reason of any approval for a Groundwater Discharge Permit. Approval by the Department is based on information supplied by the applicant. No guarantee is intended or implied by reason of any advice given by the department or its staff.

Month/Year	Collected By	Date collected	Date Recv	Time	Lab ID #	Description	Temp Recvd	Sample Date	Sample Time	Parameters	Results	Units	Date Analyzed	Time Analyzed	Test Method	Test Analyst	
May-18	K DuBaere	5/16/2018	5/16/2018	1:35	118051983.01	Effluent (Grab)	9'oc	5/16/2018	11:10	BOD	90	mg/l	5/17/2018	16:00	SM 5210B	6.0	SUB2
May-18	K DuBaere	5/16/2018	5/16/2018	1:35	118051983.01	Effluent (Grab)	9'oc	5/16/2018	11:10	E.Coli	1	mpn/100mL	5/16/2018	16:45	SM 9223B	1	SJB
May-18	K DuBaere	5/16/2018	5/16/2018	1:35	118051983.01	Effluent (Grab)	9'oc	5/16/2018	11:10	Nitrate Nitrogen	<1.0	mg/l	5/17/2018	16:00	SM 4500 NO3 D	1	SUB2
May-18	K DuBaere	5/16/2018	5/16/2018	1:35	118051983.01	Effluent (Grab)	9'oc	5/16/2018	11:10	pH	7.2	SU	5/17/2018	18:16	SM 4500HB	N/A	SUB2
May-18	K DuBaere	5/16/2018	5/16/2018	1:35	118051983.01	Effluent (Grab)	9'oc	5/16/2018	11:10	TKN	11	mg/l	5/22/2018	12:52	SM 4500 NH3D	0.5	SUB
May-18	K DuBaere	5/16/2018	5/16/2018	1:35	118051983.01	Effluent (Grab)	9'oc	5/16/2018	11:10	TSS	<10	mg/l	5/20/2018	10:00	SM 2540D	10	SUB2
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.02	Effluent (Grab)	10.6oC	6/13/2018	7:25	E.Coli	7.23	mpn/100mL	6/13/2018	15:30	SM 9223B	1	RT
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.02	Effluent (Grab)	10.6oC	6/13/2018	7:25	TKN	9.5	mg/l	6/24/2018	7:15	SM 4500NH3 D	0.5	SUB2
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.02	Effluent (Grab)	10.6oC	6/13/2018	7:25	BOD	261	mg/l	6/14/2018	16:30	SM 5210B	20	SUB2
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.02	Effluent (Grab)	10.6oC	6/13/2018	7:25	TSS	110	mg/l	6/20/2018	13:40	SM 2540D	10	SUB2
Jun-18	K DuBaere	6/27/2018	6/27/2018	12:55	118063259.01	Effluent (Grab)	12oC	6/27/2018	7:35	BOD	21	mg/l	6/28/2018	16:00	SM 5210B	6	SUB2
Jun-18	K DuBaere	6/27/2018	6/27/2018	12:55	118063259.01	Effluent (Grab)	12oC	6/27/2018	7:35	E.Coli	49	mpn/100mL	6/27/2018	17:35	SM 9223B	1	RT
Jun-18	K DuBaere	6/27/2018	6/27/2018	12:55	118063259.01	Effluent (Grab)	12oC	6/27/2018	7:35	Nitrate Nitrogen	<1.0	mg/l	6/28/2018	16:40	SM 4500 NO3 D	1	SUB2
Jun-18	K DuBaere	6/27/2018	6/27/2018	12:55	118063259.01	Effluent (Grab)	12oC	6/27/2018	7:35	pH	7.19	s.u.	6/29/2018	11:10	SM 4500HB	N/A	BR
Jun-18	K DuBaere	6/27/2018	6/27/2018	12:55	118063259.01	Effluent (Grab)	12oC	6/27/2018	7:35	TKN	4.4	mg/l	7/2/2018	17:20	SM 4500NH3 D	0.5	SUB2
Jun-18	K DuBaere	6/27/2018	6/27/2018	12:55	118063259.01	Effluent (Grab)	12oC	6/27/2018	7:35	TSS	26	mg/l	7/3/2018	16:00	SM 2540D	10	SUB2
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.02	Effluent (Grab)	15oC	7/11/2018	7:25	E.Coli	130	mpn/100mL	7/11/2018	15:00	SM 9223B	1	RT
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.02	Effluent (Grab)	15oC	7/11/2018	7:25	TKN	19	mg/l	7/19/2018	11:25	SM 4500NH3 D	0.5	SUB
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.02	Effluent (Grab)	15oC	7/11/2018	7:25	BOD	35	mg/l	7/13/2018	9:00	SM 5210B	6	SUB2
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.02	Effluent (Grab)	15oC	7/11/2018	7:25	Nitrate Nitrogen	<1.0	mg/l	7/12/2018	14:15	SM 4500 NO3 D	1	SUB2
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.02	Effluent (Grab)	15oC	7/11/2018	7:25	pH	6.4	SU	7/12/2018	16:10	SM 4500HB	N/A	SUB2
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.02	Effluent (Grab)	15oC	7/11/2018	7:25	TSS	32	mg/l	7/17/2018	17:00	SM 2540D	10	SUB2
Jul-18	K DuBaere	7/25/2018	7/25/2018	2:50	118072689.01	Effluent (Grab)	16.8oC	7/25/2018	7:20	E.Coli	64	mpn/100mL	7/25/2018	18:50	SM 9223B	1	RT
Jul-18	K DuBaere	7/25/2018	7/25/2018	2:50	118072689.01	Effluent (Grab)	16.8oC	7/25/2018	7:20	TKN	17	mg/l	7/31/2018	13:44	SM 4500NH3 D	0.5	SUB
Jul-18	K DuBaere	7/25/2018	7/25/2018	2:50	118072689.01	Effluent (Grab)	16.8oC	7/25/2018	7:20	BOD	36	mg/l	7/26/2018	15:30	SM 5210B	6	SUB2
Jul-18	K DuBaere	7/25/2018	7/25/2018	2:50	118072689.01	Effluent (Grab)	16.8oC	7/25/2018	7:20	Nitrate Nitrogen	<1.0	mg/l	7/26/2018	17:00	SM 4500 NO3 D	1	SUB2
Jul-18	K DuBaere	7/25/2018	7/25/2018	2:50	118072689.01	Effluent (Grab)	16.8oC	7/25/2018	7:20	pH	6.87	SU	7/26/2018	17:20	SM 4500HB	N/A	SUB2
Jul-18	K DuBaere	7/25/2018	7/25/2018	2:50	118072689.01	Effluent (Grab)	16.8oC	7/25/2018	7:20	TSS	66	mg/l	7/30/2018	14:50	SM 2540D	10	SUB2
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.02	Effluent (Grab)	6 oC	8/8/2018	7:50	E.Coli	488	mpn/100mL	8/8/2018	15:25	SM 9223B	1	RT
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.02	Effluent (Grab)	6 oC	8/8/2018	7:50	TKN	7.8	mg/l	8/14/2018	11:35	SM 4500NH3 D	0.5	SUB
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.02	Effluent (Grab)	6 oC	8/8/2018	7:50	BOD	31	mg/l	8/9/2018	16:30	SM 5210B	6	SUB2
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.02	Effluent (Grab)	6 oC	8/8/2018	7:50	Nitrate Nitrogen	<1.0	mg/l	8/9/2018	17:00	SM 4500 NO3 D	1	SUB2
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.02	Effluent (Grab)	6 oC	8/8/2018	7:50	pH	6.79	SU	8/9/2018	16:40	SM 4500HB	N/A	SUB2
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.02	Effluent (Grab)	6 oC	8/8/2018	7:50	TSS	84	mg/l	8/15/2018	18:40	SM 2540D	10	SUB2
Aug-18	K DuBaere	8/23/2018	8/23/2018	11:30	118082534.01	Effluent (Grab)	20.5oC	8/23/2018	7:50	E.Coli	1990	mpn/100mL	8/23/2018	13:05	SM 9223B	1	RT
Aug-18	K DuBaere	8/23/2018	8/23/2018	11:30	118082534.01	Effluent (Grab)	20.5oC	8/23/2018	7:50	TKN	7	mg/l	8/29/2018	19:00	SM 4500NH3 D	0.5	SUB
Aug-18	K DuBaere	8/23/2018	8/23/2018	11:30	118082534.01	Effluent (Grab)	20.5oC	8/23/2018	7:50	BOD	20	mg/l	8/24/2018	11:30	SM 5210B	6	SUB2
Aug-18	K DuBaere	8/23/2018	8/23/2018	11:30	118082534.01	Effluent (Grab)	20.5oC	8/23/2018	7:50	Nitrate Nitrogen	<1.0	mg/l	8/24/2018	16:40	SM 4500 NO3 D	1	SUB2
Aug-18	K DuBaere	8/23/2018	8/23/2018	11:30	118082534.01	Effluent (Grab)	20.5oC	8/23/2018	7:50	pH	6.55	SU	8/24/2018	16:35	SM 4500HB	N/A	SUB2
Aug-18	K DuBaere	8/23/2018	8/23/2018	11:30	118082534.01	Effluent (Grab)	20.5oC	8/23/2018	7:50	TSS	47	mg/l	8/27/2018	15:45	SM 2540D	10	SUB2
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.02	Effluent (Grab)	Oc	9/5/2018	8:25	E.Coli	101	mpn/100mL	9/5/2018	17:52	SM 9223B	1	AL
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.02	Effluent (Grab)	Oc	9/5/2018	8:25	TKN	13	mg/l	9/29/2018	16:00	SM 4500NH3 D	0.5	SUB
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.02	Effluent (Grab)	Oc	9/5/2018	8:25	BOD	21	mg/l	9/6/2018	16:00	SM 5210B	6	SUB2
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.02	Effluent (Grab)	Oc	9/5/2018	8:25	Nitrate Nitrogen	<1.0	mg/l	9/6/2018	15:45	SM 4500 NO3 D	1	SUB2
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.02	Effluent (Grab)	Oc	9/5/2018	8:25	pH	6.53	SU	9/6/2018	16:40	SM 4500HB	N/A	SUB2
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.02	Effluent (Grab)	Oc	9/5/2018	8:25	TSS	60	mg/l	9/10/2018	16:30	SM 2540D	10	SUB2
Sep-18	K DuBaere	9/19/2018	9/19/2018	1:50	118091909.01	Effluent (Grab)	7.5' oC	9/19/2018	7:40	E.Coli	613	mpn/100mL	9/19/2018	16:30	SM 9223B	1	RT
Sep-18	K DuBaere	9/19/2018	9/19/2018	1:50	118091909.01	Effluent (Grab)	7.5' oC	9/19/2018	7:40	TKN	12	mg/l	9/29/2018	16:00	SM 4500NH3 D	0.5	SUB2
Sep-18	K DuBaere	9/19/2018	9/19/2018	1:50	118091909.01	Effluent (Grab)	7.5' oC	9/19/2018	7:40	BOD	<20	mg/l	9/20/2018	16:00	SM 5210B	20	SUB2
Sep-18	K DuBaere	9/19/2018	9/19/2018	1:50	118091909.01	Effluent (Grab)	7.5' oC	9/19/2018	7:40	Nitrate Nitrogen	<1.0	mg/l	9/20/2018	9:50	SM 4500 NO3 D	1	SUB2
Sep-18	K DuBaere	9/19/2018	9/19/2018	1:50	118091909.01	Effluent (Grab)	7.5' oC	9/19/2018	7:40	pH	6.77	SU	9/20/2018	16:23	SM 4500HB	N/A	SUB2
Sep-18	K DuBaere	9/19/2018	9/19/2018	1:50	118091909.01	Effluent (Grab)	7.5' oC	9/19/2018	7:40	TSS	74	mg/l	9/20/2018	15:30	SM 2540D	10	SUB2
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.02	Effluent (Grab)	3.9 oC	10/3/2018	11:25	E.Coli	1600	mpn/100mL	10/3/2018	17:25	SM 9223B	1	AL
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.02	Effluent (Grab)	3.9 oC	10/3/2018	11:25	TKN	4.5	mg/l	10/8/2018	17:00	SM 4500NH3 D	0.5	SUB
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.02	Effluent (Grab)	3.9 oC	10/3/2018	11:25	BOD	19	mg/l	10/4/2018	16:00	SM 5210B	6	SUB2
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.02	Effluent (Grab)	3.9 oC	10/3/2018	11:25	Nitrate Nitrogen	<1.0	mg/l	10/4/2018	16:00	SM 4500 NO3 D	1	SUB2
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.02	Effluent (Grab)	3.9 oC	10/3/2018	11:25	pH	7.09	SU	10/4/2018	14:16	SM 4500HB	N/A	SUB2
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.02	Effluent (Grab)	3.9 oC	10/3/2018	11:25	TSS	56	mg/l	10/5/2018	15:10	SM 2540D	10	SUB2
Oct-18	K DuBaere	10/17/2018	10/17/2018	2:35	118101891.01	Effluent (Grab)	5 oC	10/17/2018	7:50	E.Coli	>2420	mpn/100mL	10/17/2018	17:35	SM 9223B	1	RT
Oct-18	K DuBaere	10/17/2018	10/17/2018	2:35	118101891.01	Effluent (Grab)	5 oC	10/17/2018	7:50	TKN	3.8	mg/l	11/9/2018	12:00	SM 4500NH3 D	0.5	SUB2
Oct-18	K DuBaere	10/17/2018	10/17/2018	2:35	118101891.01	Effluent (Grab)	5 oC	10/17/2018	7:50	BOD	<20	mg/l	10/18/2018	14:00	SM 5210B	20	SUB2
Oct-18	K DuBaere	10/17/2018	10/17/2018	2:35	118101891.01	Effluent (Grab)	5 oC	10/17/2018	7:50	Nitrate Nitrogen	<1.0	mg/l	10/18/2018	16:00	SM 4500 NO3 D	1	SUB2
Oct-18	K DuBaere	10/17/2018	10/17/2018	2:35	118101891.01	Effluent (Grab)	5 oC	10/17/2018	7:50	pH	7.11	SU	10/18/2018	15:40	SM 4500HB	N/A	SUB2
Oct-18	K DuBaere	10/17/2018	10/17/2018	2:35	118101891.01	Effluent (Grab)	5 oC	10/17/2018	7:50	TSS	52	mg/l	10/23/2018	15:10	SM 2540D	10	SUB2
May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.02	Effluent (Grab)	6'oC	5/1/2019	8:00	TKN	3.04	mg/l	5/7/2019	12:00	E351.1	SUB8	
May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.02	Effluent (Grab)	6'oC	5/1/2019	8:00	E.Coli	1	mpn/100mL	5/1/2019	14:00	SM 9223B	AL	
May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.02	Effluent (Grab)	6'oC	5/1/2019	8:00	BOD	<20	mg/l	5/2/2019	14:30	SM 5210B	SUB2	
May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.02	Effluent (Grab)	6'oC	5/1/2019	8:00	Nitrate Nitrogen	<1.0	mg/l	5/2/2019	15:55	SM 4500NO3D	SUB2	

May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.02	Effluent (Grab)	6'oC	5/1/2019	8:00	pH	7.85	s.u.	5/1/2019	16:50	SM 4500HB	SUB2	
May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.02	Effluent (Grab)	6'oC	5/1/2019	8:00	TSS	20	mg/l	5/3/2019	17:45	SM 2540D	SUB2	
May-19	K DuBaere	5/15/2019	5/15/2019	1:30	119051842.01	Effluent (Grab)	10'oC	5/15/2019	7:55	TKN	2.11	mg/l	5/21/2019	17:00	E351.1	SUB8	
May-19	K DuBaere	5/15/2019	5/15/2019	1:30	119051842.01	Effluent (Grab)	10'oC	5/15/2019	7:55	E.Coli	1	mpn/100mL	5/15/2019	17:40	SM 9223B	KLW	
May-19	K DuBaere	5/15/2019	5/15/2019	1:30	119051842.01	Effluent (Grab)	10'oC	5/15/2019	7:55	BOD	<20	mg/l	5/16/2019	15:00	SM 5210B	SUB2	
May-19	K DuBaere	5/15/2019	5/15/2019	1:30	119051842.01	Effluent (Grab)	10'oC	5/15/2019	7:55	Nitrate Nitrogen	<1.0	mg/l	5/16/2019	17:05	SM 4500NO3D	SUB2	
May-19	K DuBaere	5/15/2019	5/15/2019	1:30	119051842.01	Effluent (Grab)	10'oC	5/15/2019	7:55	pH	6.6	s.u.	5/16/2019	17:33	SM 4500HB	SUB2	
May-19	K DuBaere	5/15/2019	5/15/2019	1:30	119051842.01	Effluent (Grab)	10'oC	5/15/2019	7:55	TSS	15	mg/l	5/17/2019	15:00	SM 2540D	SUB2	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.02	Effluent (Grab)	7'oC	6/11/2019	11:50	TKN	12	mg/l	6/14/2019	12:00	E351.1	SUB	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.02	Effluent (Grab)	7'oC	6/11/2019	11:50	E.Coli	<1	mpn/100mL	6/11/2019	15:10	SM 9223B	KLW	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.02	Effluent (Grab)	7'oC	6/11/2019	11:50	BOD	15	mg/l	6/12/2019	11:30	SM 5210B	SUB2	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.02	Effluent (Grab)	7'oC	6/11/2019	11:50	Nitrate Nitrogen	<1.0	mg/l	6/12/2019	16:45	SM 4500NO3D	SUB2	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.02	Effluent (Grab)	7'oC	6/11/2019	11:50	pH	6.89	s.u.	6/12/2019	16:30	SM 4500HB	SUB2	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.02	Effluent (Grab)	7'oC	6/11/2019	11:50	TSS	<10	mg/l	6/13/2019	14:00	SM 2540D	SUB2	
Jun-19	K DuBaere	6/19/2019	6/19/2019	1:40	119062221.01	Effluent (Grab)	16.9'oC	6/19/2019	8:05	TKN	16.4	mg/l	6/22/2019	12:00	E351.1	SUB8	
Jun-19	K DuBaere	6/19/2019	6/19/2019	1:40	119062221.01	Effluent (Grab)	16.9'oC	6/19/2019	8:05	E.Coli	<1	mpn/100mL	6/19/2019	15:25	SM 9223B	KLW	
Jun-19	K DuBaere	6/19/2019	6/19/2019	1:40	119062221.01	Effluent (Grab)	16.9'oC	6/19/2019	8:05	BOD	<20	mg/l	6/20/2019	16:30	SM 5210B	SUB2	
Jun-19	K DuBaere	6/19/2019	6/19/2019	1:40	119062221.01	Effluent (Grab)	16.9'oC	6/19/2019	8:05	Nitrate Nitrogen	<1.0	mg/l	6/20/2019	16:23	SM 4500NO3D	SUB2	
Jun-19	K DuBaere	6/19/2019	6/19/2019	1:40	119062221.01	Effluent (Grab)	16.9'oC	6/19/2019	8:05	pH	7.03	s.u.	6/20/2019	17:38	SM 4500HB	SUB2	
Jun-19	K DuBaere	6/19/2019	6/19/2019	1:40	119062221.01	Effluent (Grab)	16.9'oC	6/19/2019	8:05	TSS	<10	mg/l	6/21/2019	14:50	SM 2540D	SUB2	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.02	Effluent (Grab)	22.8' oC	7/2/2019	9:40	TKN	16.7	mg/l	7/9/2019	12:00	E351.1	SUB8	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.02	Effluent (Grab)	22.8' oC	7/2/2019	9:40	E.Coli	3	mpn/100mL	7/2/2019	13:10	SM 9223B	KLW	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.02	Effluent (Grab)	22.8' oC	7/2/2019	9:40	BOD	<20	mg/l	7/3/2019	17:00	SM 5210B	SUB2	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.02	Effluent (Grab)	22.8' oC	7/2/2019	9:40	Nitrate Nitrogen	<1.0	mg/l	7/3/2019	16:32	SM 4500NO3D	SUB2	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.02	Effluent (Grab)	22.8' oC	7/2/2019	9:40	pH	7.37	s.u.	7/3/2019	17:37	SM 4500HB	SUB2	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.02	Effluent (Grab)	22.8' oC	7/2/2019	9:40	TSS	<10	mg/l	7/3/2019	18:30	SM 2540D	SUB2	
Jul-19	K DuBaere	7/24/2019	7/24/2019	10:00	119072873.01	Effluent (Grab)	21'oC	7/24/2019	7:40	BOD	21	mg/l	7/26/2019	14:50	SM 5210B	SUB2	
Jul-19	K DuBaere	7/24/2019	7/24/2019	10:00	119072873.01	Effluent (Grab)	21'oC	7/24/2019	7:40	Nitrate Nitrogen	<1.0	mg/l	7/26/2019	16:20	SM 4500NO3D	SUB2	
Jul-19	K DuBaere	7/24/2019	7/24/2019	10:00	119072873.01	Effluent (Grab)	21'oC	7/24/2019	7:40	pH	6.77	s.u.	7/26/2019	16:15	SM 4500HB	SUB2	
Jul-19	K DuBaere	7/24/2019	7/24/2019	10:00	119072873.01	Effluent (Grab)	21'oC	7/24/2019	7:40	TSS	19	mg/l	7/26/2019	12:00	SM 2540D	SUB2	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.02	Effluent (Grab)	21'oC	8/7/2019	10:00	TKN	9.91	mg/l	8/14/2019	12:00	E351.1	SUB8	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.02	Effluent (Grab)	21'oC	8/7/2019	10:00	E.Coli	15	mpn/100mL	8/7/2019	13:20	SM 9223B	AL	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.02	Effluent (Grab)	21'oC	8/7/2019	10:00	BOD	25	mg/l	8/8/2019	11:30	SM 5210B	SUB2	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.02	Effluent (Grab)	21'oC	8/7/2019	10:00	Nitrate Nitrogen	<1.0	mg/l	8/7/2019	17:30	SM 4500NO3D	SUB2	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.02	Effluent (Grab)	21'oC	8/7/2019	10:00	pH	6.74	s.u.	8/8/2019	12:44	SM 4500HB	SUB2	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.02	Effluent (Grab)	21'oC	8/7/2019	10:00	TSS	34	mg/l	8/13/2019	14:00	SM 2540D	SUB2	
Aug-19	K DuBaere	8/21/2019	8/21/2019	1:30	119082573.01	Effluent (Grab)	11' oC	8/21/2019	7:20	TKN	7.98	mg/l	8/28/2019	12:00	E351.1	SUB8	
Aug-19	K DuBaere	8/21/2019	8/21/2019	1:30	119082573.01	Effluent (Grab)	11' oC	8/21/2019	7:20	E.Coli	<1	mpn/100mL	8/21/2019	15:20	SM 9223B	AL	
Aug-19	K DuBaere	8/21/2019	8/21/2019	1:30	119082573.01	Effluent (Grab)	11' oC	8/21/2019	7:20	BOD	33	mg/l	8/22/2019	11:00	SM 5210B	SUB2	
Aug-19	K DuBaere	8/21/2019	8/21/2019	1:30	119082573.01	Effluent (Grab)	11' oC	8/21/2019	7:20	Nitrate Nitrogen	<1.0	mg/l	8/22/2019	17:00	SM 4500NO3D	SUB2	
Aug-19	K DuBaere	8/21/2019	8/21/2019	1:30	119082573.01	Effluent (Grab)	11' oC	8/21/2019	7:20	pH	6.53	s.u.	8/22/2019	11:04	SM 4500HB	SUB2	
Aug-19	K DuBaere	8/21/2019	8/21/2019	1:30	119082573.01	Effluent (Grab)	11' oC	8/21/2019	7:20	TSS	52.00	mg/l	8/22/2019	14:05	SM 2540D	SUB2	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.02	Effluent (Grab)	10' Oc	9/4/2019	7:40	TKN	6.67	mg/l	9/6/2019	12:00	E351.1	SUB8	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.02	Effluent (Grab)	10' Oc	9/4/2019	7:40	E.Coli	12	mpn/100mL	9/4/2019	14:30	SM 9223B	KLW	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.02	Effluent (Grab)	10' Oc	9/4/2019	7:40	BOD	24	mg/l	9/5/2019	12:00	SM 5210B	SUB2	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.02	Effluent (Grab)	10' Oc	9/4/2019	7:40	Nitrate Nitrogen	<1.0	mg/l	9/5/2019	16:35	SM 4500NO3D	SUB2	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.02	Effluent (Grab)	10' Oc	9/4/2019	7:40	pH	6.53	s.u.	9/5/2019	11:54	SM 4500HB	SUB2	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.02	Effluent (Grab)	10' Oc	9/4/2019	7:40	TSS	12	mg/l	9/6/2019	15:05	SM 2540D	SUB2	
Sep-19	K DuBaere	9/18/2019	9/18/2019	2:30	119091945.01	Effluent (Grab)	7.5' oC	9/18/2019	8:10	TKN	16.2	mg/l	9/20/2019	12:00	E351.1	SUB8	
Sep-19	K DuBaere	9/18/2019	9/18/2019	2:30	119091945.01	Effluent (Grab)	7.5' oC	9/18/2019	8:10	E.Coli	22	mpn/100mL	9/18/2019	15:20	SM 9223B	AL	
Sep-19	K DuBaere	9/18/2019	9/18/2019	2:30	119091945.01	Effluent (Grab)	7.5' oC	9/18/2019	8:10	BOD	60	mg/l	9/19/2019	13:30	SM 5210B	SUB2	
Sep-19	K DuBaere	9/18/2019	9/18/2019	2:30	119091945.01	Effluent (Grab)	7.5' oC	9/18/2019	8:10	Nitrate Nitrogen	<1.0	mg/l	9/19/2019	16:40	SM 4500NO3D	SUB2	
Sep-19	K DuBaere	9/18/2019	9/18/2019	2:30	119091945.01	Effluent (Grab)	7.5' oC	9/18/2019	8:10	pH	6.70	s.u.	9/19/2019	16:11	SM 4500HB	SUB2	
Sep-19	K DuBaere	9/18/2019	9/18/2019	2:30	119091945.01	Effluent (Grab)	7.5' oC	9/18/2019	8:10	TSS	110	mg/l	9/20/2019	18:50	SM 2540D	SUB2	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.02	Effluent (Grab)	9.8' oC	10/2/2019	9:20	TKN	17.1	mg/l	10/10/2019	17:00	E351.1	SUB8	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.02	Effluent (Grab)	9.8' oC	10/2/2019	9:20	E.Coli	11	mpn/100mL	10/2/2019	14:25	SM 9223B	AL	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.02	Effluent (Grab)	9.8' oC	10/2/2019	9:20	BOD	95	mg/l	10/3/2019	15:00	SM 5210B	SUB2	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.02	Effluent (Grab)	9.8' oC	10/2/2019	9:20	Nitrate Nitrogen	<1.0	mg/l	10/3/2019	17:07	SM 4500NO3D	SUB2	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.02	Effluent (Grab)	9.8' oC	10/2/2019	9:20	pH	6.43	s.u.	10/3/2019	16:16	SM 4500HB	SUB2	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.02	Effluent (Grab)	9.8' oC	10/2/2019	9:20	TSS	80	mg/l	10/4/2019	20:20	SM 2540D	SUB2	
Oct-19	K DuBaere	10/16/2019	10/16/2019	2:15	119101923.01	Effluent (Grab)	11.8 oC	10/16/2019	8:50	TKN	9.04	mg/l	10/24/2019	17:00	E351.1	SUB8	
Oct-19	K DuBaere	10/16/2019	10/16/2019	2:15	119101923.01	Effluent (Grab)	11.8 oC	10/16/2019	8:50	E.Coli	461	mpn/100mL	10/16/2019	14:25	SM 9223B	AL	
Oct-19	K DuBaere	10/16/2019	10/16/2019	2:15	119101923.01	Effluent (Grab)	11.8 oC	10/16/2019	8:50	BOD	74	mg/l	10/17/2019	17:00	SM 5210B	SUB2	
Oct-19	K DuBaere	10/16/2019	10/16/2019	2:15	119101923.01	Effluent (Grab)	11.8 oC	10/16/2019	8:50	Nitrate Nitrogen	<1.0	mg/l	10/17/2019	16:38	SM 4500NO3D	SUB2	
Oct-19	K DuBaere	10/16/2019	10/16/2019	2:15	119101923.01	Effluent (Grab)	11.8 oC	10/16/2019	8:50	pH	7.01	s.u.	10/17/2019	16:31	SM 4500HB	SUB2	
Oct-19	K DuBaere	10/16/2019	10/16/2019	2:15	119101923.01	Effluent (Grab)	11.8 oC	10/16/2019	8:50	TSS	84	mg/l	10/19/2019	15:00	SM 2540D	SUB2	
May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.02	Effluent (Grab)	12'oC	5/13/2020	11:10	E.Coli	206	mpn/100ml	5/13/2020	16:00	SM 9223B	NH	
May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.02	Effluent (Grab)	12'oC	5/13/2020	11:10	BOD	8	mg/l	5/14/2020	12:00	SM 5210B	SUB2	
May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.02	Effluent (Grab)	12'oC	5/13/2020	11:10	Nitrate Nitrogen	<1.0	mg/l	5/14/2020	14:00	SM 4500N03D	SUB2	

May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.02	Effluent (Grab)	12'oC	5/13/2020	11:10	pH	6.52	s.u.	5/14/2020	12:40	SM 4500HB	SUB2
May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.02	Effluent (Grab)	12'oC	5/13/2020	11:10	TKN	3.26	mg/l	5/22/2020	12:00	E351.1	SUB8
May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.02	Effluent (Grab)	12'oC	5/13/2020	11:10	TSS	33	mg/l	5/14/2020	10:20	SM 2540D	SUB2
May-20	K DuBaere	5/20/2020	5/20/2020	1:00	120051132.02	Effluent (Grab)	15'oc	5/20/2020	11:15	E.Coli	72	mpn/100ml	5/27/2020	14:50	SM 9223B	NH
May-20	K DuBaere	5/20/2020	5/20/2020	1:00	120051132.02	Effluent (Grab)	15'oc	5/20/2020	11:15	BOD	<20	mg/l	5/20/2020	12:00	SM 5210B	SUB2
May-20	K DuBaere	5/20/2020	5/20/2020	1:00	120051132.02	Effluent (Grab)	15'oc	5/20/2020	11:15	Nitrate Nitrogen	<1.0	mg/l	5/21/2020	16:00	SM 4500N03D	SUB2
May-20	K DuBaere	5/20/2020	5/20/2020	1:00	120051132.02	Effluent (Grab)	15'oc	5/20/2020	11:15	pH	6.65	s.u.	5/21/2020	16:00	SM 4500HB	SUB2
May-20	K DuBaere	5/20/2020	5/20/2020	1:00	120051132.02	Effluent (Grab)	15'oc	5/20/2020	11:15	TKN	5.95	mg/l	5/21/2020	17:00	E351.1	SUB8
May-20	K DuBaere	5/20/2020	5/20/2020	1:00	120051132.02	Effluent (Grab)	15'oc	5/20/2020	11:15	TSS	34	mg/l	5/21/2020	18:00	SM 2540D	SUB2
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.02	Effluent (Grab)	11.9'oC	6/3/2020	10:20	TKN	7.68	mg/l	6/12/2020	17:00	E351.1	SUB8
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.02	Effluent (Grab)	11.9'oC	6/3/2020	10:20	E.Coli	60	mpn/100ml	6/3/2020	14:25	SM 9223B	NH
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.02	Effluent (Grab)	11.9'oC	6/3/2020	10:20	BOD	<20	mg/l	6/5/2020	10:15	SM 5210B	SUB2
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.02	Effluent (Grab)	11.9'oC	6/3/2020	10:20	Nitrate Nitrogen	<1.0	mg/l	6/5/2020	11:41	SM 4500N03D	SUB2
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.02	Effluent (Grab)	11.9'oC	6/3/2020	10:20	pH	6.67	s.u.	6/5/2020	11:40	SM 4500HB	SUB2
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.02	Effluent (Grab)	11.9'oC	6/3/2020	10:20	TSS	<10	mg/l	6/5/2020	6:30	SM 2540D	SUB2
Jun-20	K DuBaere	6/18/2020	6/18/2020	12:50	120062198.01	Effluent (Grab)	16.4'oC	6/18/2020	9:15	TKN	6.28	mg/l	7/1/2020	17:00	E351.1	SUB8
Jun-20	K DuBaere	6/18/2020	6/18/2020	12:50	120062198.01	Effluent (Grab)	16.4'oC	6/18/2020	9:15	E.Coli	31	/100ml	6/18/2020	14:35	SM 9223B	NH
Jun-20	K DuBaere	6/24/2020	6/24/2020	4:10	120062982.01	Effluent (Grab)	9.4'oC	6/24/2020	8:40	BOD	<20	mg/l	6/25/2020	12:00	SM 5210B	SUB2
Jun-20	K DuBaere	6/24/2020	6/24/2020	4:10	120062982.01	Effluent (Grab)	9.4'oC	6/24/2020	8:40	Nitrate Nitrogen	<1.0	mg/l	6/25/2020	16:18	SM 4500N03D	SUB2
Jun-20	K DuBaere	6/24/2020	6/24/2020	4:10	120062982.01	Effluent (Grab)	9.4'oC	6/24/2020	8:40	pH	6.77	s.u.	6/25/2020	14:31	SM 4500HB	SUB2
Jun-20	K DuBaere	6/24/2020	6/24/2020	4:10	120062982.01	Effluent (Grab)	9.4'oC	6/24/2020	8:40	TSS	12.0	mg/l	6/26/2020	9:00	SM 2540D	SUB2
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.02	Effluent (Grab)	13.9' oC	7/1/2020	8:45	TKN	6.70	mg/l	7/17/2020	15:51	E351.1	SUB8
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.02	Effluent (Grab)	13.9' oC	7/1/2020	8:45	E.Coli	2	mpn/100ml	7/1/2020	15:55	SM 9223B	NH
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.02	Effluent (Grab)	13.9' oC	7/1/2020	8:45	BOD	15	mg/l	7/2/2020	12:00	SM 5210B	SUB2
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.02	Effluent (Grab)	13.9' oC	7/1/2020	8:45	Nitrate Nitrogen	<1.0	mg/l	7/7/2020	16:39	SM 4500N03D	SUB2
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.02	Effluent (Grab)	13.9' oC	7/1/2020	8:45	pH	7.16	s.u.	7/1/2020	16:26	SM 4500HB	SUB2
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.02	Effluent (Grab)	13.9' oC	7/1/2020	8:45	TSS	<10	mg/l	7/2/2020	12:00	SM 2540D	SUB2
Jul-20	K DuBaere	7/15/2020	7/15/2020	1:30	120071770.01	Effluent (Grab)	17'oc	7/15/2020	8:30	TKN	5.10	mg/l	7/23/2020	17:00	E351.1	SUB8
Jul-20	K DuBaere	7/15/2020	7/15/2020	1:30	120071770.01	Effluent (Grab)	17'oc	7/15/2020	8:30	E.Coli	21	mpn/100ml	7/15/2020	15:15	SM 9223B	NH
Jul-20	K DuBaere	7/15/2020	7/15/2020	1:30	120071770.01	Effluent (Grab)	17'oc	7/15/2020	8:30	BOD	<20	mg/l	7/16/2020	14:00	SM 5210B	SUB2
Jul-20	K DuBaere	7/15/2020	7/15/2020	1:30	120071770.01	Effluent (Grab)	17'oc	7/15/2020	8:30	Nitrate Nitrogen	<1.0	mg/l	7/16/2020	16:40	SM 4500N03D	SUB2
Jul-20	K DuBaere	7/15/2020	7/15/2020	1:30	120071770.01	Effluent (Grab)	17'oc	7/15/2020	8:30	pH	6.55	s.u.	7/16/2020	16:08	SM 4500HB	SUB2
Jul-20	K DuBaere	7/15/2020	7/15/2020	1:30	120071770.01	Effluent (Grab)	17'oc	7/15/2020	8:30	TSS	26	mg/l	7/16/2020	17:00	SM 2540D	SUB2
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.02	Effluent (Grab)	18' oC	8/5/2020	7:30	TKN	3.5	mg/l	8/12/2020	17:00	E351.1	SUB8
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.02	Effluent (Grab)	18' oC	8/5/2020	7:30	E.Coli	12	mpn/100ml	8/5/2020	17:00	SM 9223B	KLW
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.02	Effluent (Grab)	18' oC	8/5/2020	7:30	BOD	24	mg/l	8/6/2020	12:00	SM 5210B	SUB2
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.02	Effluent (Grab)	18' oC	8/5/2020	7:30	Nitrate Nitrogen	<1.0	mg/l	8/5/2020	16:29	SM 4500N03D	SUB2
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.02	Effluent (Grab)	18' oC	8/5/2020	7:30	pH	6.88	s.u.	8/5/2020	16:15	SM 4500HB	SUB2
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.02	Effluent (Grab)	18' oC	8/5/2020	7:30	TSS	18	mg/l	8/7/2020	18:50	SM 2540D	SUB2
Aug-20	K DuBaere	8/19/2020	8/19/2020	1:40	120082231.01	Effluent (Grab)	18.5' oC	8/19/2020	7:45	TKN	4.0	mg/l	8/25/2020	12:00	E351.1	SUB8
Aug-20	K DuBaere	8/19/2020	8/19/2020	1:40	120082231.01	Effluent (Grab)	18.5' oC	8/19/2020	7:45	E.Coli	<1	mpn/100ml	8/19/2020	16:00	SM 9223B	EMG
Aug-20	K DuBaere	8/19/2020	8/19/2020	1:40	120082231.01	Effluent (Grab)	18.5' oC	8/19/2020	7:45	BOD	12	mg/l	8/20/2020	11:30	SM 5210B	SUB2
Aug-20	K DuBaere	8/19/2020	8/19/2020	1:40	120082231.01	Effluent (Grab)	18.5' oC	8/19/2020	7:45	Nitrate Nitrogen	<1.0	mg/l	8/20/2020	15:59	SM 4500N03D	SUB2
Aug-20	K DuBaere	8/19/2020	8/19/2020	1:40	120082231.01	Effluent (Grab)	18.5' oC	8/19/2020	7:45	pH	6.25	s.u.	8/20/2020	15:52	SM 4500HB	SUB2
Aug-20	K DuBaere	8/19/2020	8/19/2020	1:40	120082231.01	Effluent (Grab)	18.5' oC	8/19/2020	7:45	TSS	24	mg/l	8/22/2020	15:30	SM 2540D	SUB2
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.02	Effluent (Grab)	10.8' oC	9/2/2020	8:45	TKN	6.64	mg/l	9/11/2020	17:00	E351.1	SUB8
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.02	Effluent (Grab)	10.8' oC	9/2/2020	8:45	E.Coli	99	mpn/100ml	9/2/2020	16:30	SM 9223B	NH
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.02	Effluent (Grab)	10.8' oC	9/2/2020	8:45	BOD	32	mg/l	9/3/2020	15:00	SM 5210B	SUB2
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.02	Effluent (Grab)	10.8' oC	9/2/2020	8:45	Nitrate Nitrogen	<1.0	mg/l	9/3/2020	18:50	SM 4500N03D	SUB2
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.02	Effluent (Grab)	10.8' oC	9/2/2020	8:45	pH	6.51	s.u.	9/3/2020	16:36	SM 4500HB	SUB2
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.02	Effluent (Grab)	10.8' oC	9/2/2020	8:45	TSS	100	mg/l	9/4/2020	9:00	SM 2540D	SUB2
Sep-20	K DuBaere	9/16/2020	9/16/2020	1:40	120091956.01	Effluent (Grab)	12.2' oC	9/16/2020	8:25	TKN	4.48	mg/l	9/22/2020	12:00	E351.1	SUB8
Sep-20	K DuBaere	9/16/2020	9/16/2020	1:40	120091956.01	Effluent (Grab)	12.2' oC	9/16/2020	8:25	E.Coli	>2420	mpn/100ml	9/16/2020	14:25	SM 9223B	EMG
Sep-20	K DuBaere	9/16/2020	9/16/2020	1:40	120091956.01	Effluent (Grab)	12.2' oC	9/16/2020	8:25	BOD	15	mg/l	9/17/2020	17:41	SM 5210B	SUB
Sep-20	K DuBaere	9/16/2020	9/16/2020	1:40	120091956.01	Effluent (Grab)	12.2' oC	9/16/2020	8:25	Nitrate Nitrogen	<1.0	mg/l	9/16/2020	16:45	SM 4500N03D	GP
Sep-20	K DuBaere	9/16/2020	9/16/2020	1:40	120091956.01	Effluent (Grab)	12.2' oC	9/16/2020	8:25	pH	6.81	s.u.	9/16/2020	16:10	SM 4500HB	GP
Sep-20	K DuBaere	9/16/2020	9/16/2020	1:40	120091956.01	Effluent (Grab)	12.2' oC	9/16/2020	8:25	TSS	26	mg/l	9/18/2020	16:23	SM 2540D	SUB
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.02	Effluent (Grab)	15' oC	10/7/2020	12:43	TKN	34.5	mg/l	10/14/2020	12:00	E351.1	SUB8
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.02	Effluent (Grab)	15' oC	10/7/2020	12:43	E.Coli	1203	mpn/100ml	10/7/2020	15:00	SM 9223B	NH
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.02	Effluent (Grab)	15' oC	10/7/2020	12:43	BOD	83	mg/l	10/8/2020	16:07	SM 5210B	SUB
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.02	Effluent (Grab)	15' oC	10/7/2020	12:43	Nitrate Nitrogen	<1.0	mg/l	10/7/2020	16:25	SM 4500N03D	GP
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.02	Effluent (Grab)	15' oC	10/7/2020	12:43	pH	7.08	s.u.	10/7/2020	15:45	SM 4500HB	GP
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.02	Effluent (Grab)	15' oC	10/7/2020	12:43	TSS	66.0	mg/l	10/9/2020	12:00	SM 2540D	SUB8
Oct-20	K DuBaere	10/21/2020	10/21/2020	2:10	120102486.01	Effluent (Grab)	18.8' oC	10/21/2020	8:55	TKN	66.0	mg/l	10/30/2020	12:00	E351.1	SUB8
Oct-20	K DuBaere	10/21/2020	10/21/2020	2:10	120102486.01	Effluent (Grab)	18.8' oC	10/21/2020	8:55	E.Coli	91	mpn/100ml	10/21/2020	16:10	SM 9223B	NH
Oct-20	K DuBaere	10/21/2020	10/21/2020	2:10	120102486.01	Effluent (Grab)	18.8' oC	10/21/2020	8:55	BOD	490	mg/l	10/22/2020	17:14	SM 5210B	SUB8
Oct-20	K DuBaere	10/21/2020	10/21/2020	2:10	120102486.01	Effluent (Grab)	18.8' oC	10/21/2020	8:55	Nitrate Nitrogen	<1.0	mg/l	10/21/2020	16:20	SM 4500N03D	GP
Oct-20	K DuBaere	10/21/2020	10/21/2020	2:10	120102486.01	Effluent (Grab)	18.8' oC	10/21/2020	8:55	pH	6.79	s.u.	10/21/2020	14:45	SM 4500HB	GP
Oct-20	K DuBaere	10/21/2020	10/21/2020	2:10	120102486.01	Effluent (Grab)	18.8' oC	10/21/2020	8:55	TSS	120	mg/l	10/25/2020	12:00	SM 2540D	SUB8

May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.02	Effluent (Grab)	17'oC	5/19/2021	7:40	TKN	5.6	mg/l	5/26/2021	12:00	E351.1	SUB8	
May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.02	Effluent (Grab)	17'oC	5/19/2021	7:40	E.Coli	12	mpn/100mL	5/19/2021	13:00	SM9223B	KLW	
May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.02	Effluent (Grab)	17'oC	5/19/2021	7:40	BOD	<4.1	mg/l	5/20/2021	17:54	SM5210B	SUB8	
May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.02	Effluent (Grab)	17'oC	5/19/2021	7:40	Nitrate Nitrogen	<1.0	mg/l	5/20/2021	11:01	SM4500NO3D	NH	
May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.02	Effluent (Grab)	17'oC	5/19/2021	7:40	pH	7.57	s.u.	5/19/2021	12:55	SM4500HB	GP	
May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.02	Effluent (Grab)	17'oC	5/19/2021	7:40	TSS	<5.0	mg/l	5/21/2021	12:00	SM2540D	SUB8	
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.02	Effluent (Grab)	7.1'oC	6/2/2021	6:30	TKN	12.5	mg/l	6/10/2021	12:00	E351.1	SUB8	
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.02	Effluent (Grab)	7.1'oC	6/2/2021	6:30	E.Coli	2	mpn/100mL	6/2/2021	16:30	SM9223B	SH	
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.02	Effluent (Grab)	7.1'oC	6/2/2021	6:30	BOD	5.4	mg/l	6/3/2021	16:40	SM5210B	SUB8	
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.02	Effluent (Grab)	7.1'oC	6/2/2021	6:30	Nitrate Nitrogen	<1.0	mg/l	6/3/2021	12:44	SM4500NO3D	NH	
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.02	Effluent (Grab)	7.1'oC	6/2/2021	6:30	pH	7.01	s.u.	6/2/2021	16:10	SM4500HB	NH	
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.02	Effluent (Grab)	7.1'oC	6/2/2021	6:30	TSS	6.0	mg/l	6/4/2021	12:00	SM2540D	SUB8	
Jun-21	K DuBaere	6/16/2021	6/16/2021	10:45	121061733.01	Effluent (Grab)	19.9'oC	6/16/2021	7:40	TKN	59.7	mg/l	6/22/2021	12:00	E351.1	SUB8	
Jun-21	K DuBaere	6/16/2021	6/16/2021	10:45	121061733.01	Effluent (Grab)	19.9'oC	6/16/2021	7:40	E.Coli	<1	mpn/100mL	6/16/2021	15:20	SM9223B	SH	
Jun-21	K DuBaere	6/16/2021	6/16/2021	10:45	121061733.01	Effluent (Grab)	19.9'oC	6/16/2021	7:40	BOD	210	mg/l	6/16/2021	16:18	SM5210B	SUB8	
Jun-21	K DuBaere	6/16/2021	6/16/2021	10:45	121061733.01	Effluent (Grab)	19.9'oC	6/16/2021	7:40	Nitrate Nitrogen	<1.0	mg/l	6/16/2021	11:14	SM4500NO3D	NH	
Jun-21	K DuBaere	6/16/2021	6/16/2021	10:45	121061733.01	Effluent (Grab)	19.9'oC	6/16/2021	7:40	pH	6.64	s.u.	6/16/2021	11:30	SM4500HB	NH	
Jun-21	K DuBaere	6/16/2021	6/16/2021	10:45	121061733.01	Effluent (Grab)	19.9'oC	6/16/2021	7:40	TSS	120	mg/l	6/17/2021	12:00	SM2540D	SUB8	
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.02	Effluent (Grab)	12'oc	7/7/2021	7:55	TKN	13.3	mg/l	7/16/2021	12:00	E351.1	SUB8	
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.02	Effluent (Grab)	12'oc	7/7/2021	7:55	E.Coli	79	mpn/100mL	7/7/2021	15:00	SM9223B	KF	
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.02	Effluent (Grab)	12'oc	7/7/2021	7:55	BOD	<15	mg/l	7/8/2021	17:54	SM5210B	SUB8	
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.02	Effluent (Grab)	12'oc	7/7/2021	7:55	Nitrate Nitrogen	<1.0	mg/l	7/7/2021	16:00	SM4500NO3D	NH	
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.02	Effluent (Grab)	12'oc	7/7/2021	7:55	pH	6.95	s.u.	7/7/2021	15:10	SM4500HB	NH	
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.02	Effluent (Grab)	12'oc	7/7/2021	7:55	TSS	19	mg/l	7/9/2021	12:00	SM2540D	SUB8	
Jul-21	K DuBaere	7/21/2021	7/21/2021	10:30	121072039.01	Effluent (Grab)	21.3'oc	7/21/2021	8:05	TKN	11.9	mg/l	7/30/2021	12:00	E351.1	SUB8	
Jul-21	K DuBaere	7/21/2021	7/21/2021	10:30	121072039.01	Effluent (Grab)	21.3'oc	7/21/2021	8:05	E.Coli	12	mpn/100mL	7/21/2021	12:10	SM9223B	SH	
Jul-21	K DuBaere	7/21/2021	7/21/2021	10:30	121072039.01	Effluent (Grab)	21.3'oc	7/21/2021	8:05	BOD	53	mg/l	7/22/2021	14:00	SM5210B	SUB8	
Jul-21	K DuBaere	7/21/2021	7/21/2021	10:30	121072039.01	Effluent (Grab)	21.3'oc	7/21/2021	8:05	Nitrate Nitrogen	<1.0	mg/l	7/21/2021	15:34	SM4500NO3D	NH	
Jul-21	K DuBaere	7/21/2021	7/21/2021	10:30	121072039.01	Effluent (Grab)	21.3'oc	7/21/2021	8:05	pH	7.04	s.u.	7/21/2021	11:54	SM4500HB	GP	
Jul-21	K DuBaere	7/21/2021	7/21/2021	10:30	121072039.01	Effluent (Grab)	21.3'oc	7/21/2021	8:05	TSS	13	mg/l	7/23/2021	12:00	SM2540D	SUB8	
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.02	Effluent (Grab)	5' oC	8/4/2021	8:00	TKN	8.50	mg/l	8/11/2021	12:00	E351.1	AON	
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.02	Effluent (Grab)	5' oC	8/4/2021	8:00	E.Coli	1300	mpn/100mL	8/4/2021	15:20	SM9223B	KF	
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.02	Effluent (Grab)	5' oC	8/4/2021	8:00	BOD	12	mg/l	8/5/2021	17:25	SM5210B	AON	
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.02	Effluent (Grab)	5' oC	8/4/2021	8:00	Nitrate Nitrogen	<1.0	mg/l	8/4/2021	16:55	SM4500NO3D	NH	
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.02	Effluent (Grab)	5' oC	8/4/2021	8:00	pH	6.76	s.u.	8/4/2021	16:03	SM4500HB	NH	
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.02	Effluent (Grab)	5' oC	8/4/2021	8:00	TSS	41	mg/l	8/6/2021	12:00	SM2540D	AON	
Aug-21	K DuBaere	8/18/2021	8/18/2021	11:30	121081938.01	Effluent (Grab)	22.1'oc	8/18/2021	10:20	TKN	7.59	mg/l	8/26/2021	12:00	E351.1	MAB	
Aug-21	K DuBaere	8/18/2021	8/18/2021	11:30	121081938.01	Effluent (Grab)	22.1'oc	8/18/2021	10:20	E.Coli	1203	mpn/100mL	8/18/2021	13:40	SM9223B	KF	
Aug-21	K DuBaere	8/18/2021	8/18/2021	11:30	121081938.01	Effluent (Grab)	22.1'oc	8/18/2021	10:20	BOD	9.3	mg/l	8/19/2021	17:27	SM5210B	SUB8	
Aug-21	K DuBaere	8/18/2021	8/18/2021	11:30	121081938.01	Effluent (Grab)	22.1'oc	8/18/2021	10:20	Nitrate Nitrogen	<1.0	mg/l	8/18/2021	13:09	SM4500NO3D	NH	
Aug-21	K DuBaere	8/18/2021	8/18/2021	11:30	121081938.01	Effluent (Grab)	22.1'oc	8/18/2021	10:20	pH	6.72	s.u.	8/18/2021	13:10	SM4500HB	NH	
Aug-21	K DuBaere	8/18/2021	8/18/2021	11:30	121081938.01	Effluent (Grab)	22.1'oc	8/18/2021	10:20	TSS	53	mg/l	8/20/2021	12:00	SM2540D	SUB8	
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.02	Effluent (Grab)	5.9'oC	9/1/2021	8:10	TKN	7.88	mg/l	9/10/2021	12:00	E351.1	SUB8	
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.02	Effluent (Grab)	5.9'oC	9/1/2021	8:10	E.Coli	517	mpn/100mL	9/1/2021	17:05	SM9223B	KLW	
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.02	Effluent (Grab)	5.9'oC	9/1/2021	8:10	BOD	24	mg/l	9/2/2021	16:46	SM5210B	SUB8	
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.02	Effluent (Grab)	5.9'oC	9/1/2021	8:10	Nitrate Nitrogen	<1.0	mg/l	9/1/2021	15:18	SM4500NO3D	NH	
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.02	Effluent (Grab)	5.9'oC	9/1/2021	8:10	pH	6.41	s.u.	9/1/2021	16:41	SM4500HB	NH	
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.02	Effluent (Grab)	5.9'oC	9/1/2021	8:10	TSS	54	mg/l	9/7/2021	12:00	SM2540D	SUB8	
Sep-21	K DuBaere	9/15/2021	9/15/2021	11:55	121091603.01	Effluent (Grab)	20.2'oc	9/15/2021	8:20	TKN	6.20	mg/l	9/28/2021	12:00	E351.1	SUB8	
Sep-21	K DuBaere	9/15/2021	9/15/2021	11:55	121091603.01	Effluent (Grab)	20.2'oc	9/15/2021	8:20	E.Coli	144	mpn/100mL	9/15/2021	15:15	SM9223B	KF	
Sep-21	K DuBaere	9/15/2021	9/15/2021	11:55	121091603.01	Effluent (Grab)	20.2'oc	9/15/2021	8:20	BOD	19	mg/l	9/16/2021	18:03	SM5210B	SUB8	
Sep-21	K DuBaere	9/15/2021	9/15/2021	11:55	121091603.01	Effluent (Grab)	20.2'oc	9/15/2021	8:20	Nitrate Nitrogen	<1.0	mg/l	9/15/2021	12:30	SM4500NO3D	NH	
Sep-21	K DuBaere	9/15/2021	9/15/2021	11:55	121091603.01	Effluent (Grab)	20.2'oc	9/15/2021	8:20	pH	6.84	s.u.	9/15/2021	12:35	SM4500HB	NH	
Sep-21	K DuBaere	9/15/2021	9/15/2021	11:55	121091603.01	Effluent (Grab)	20.2'oc	9/15/2021	8:20	TSS	40	mg/l	9/20/2021	12:00	SM2540D	SUB8	
Oct-21	K DuBaere	10/8/2021	10/8/2021	2:55	121100902.01	Effluent (Grab)	14'oC	10/8/2021	10:55	TKN	5.70	mg/l	10/19/2021	12:00	E351.1	SUB8	
Oct-21	K DuBaere	10/8/2021	10/8/2021	2:55	121100902.01	Effluent (Grab)	14'oC	10/8/2021	10:55	E.Coli	461	mpn/100mL	10/8/2021	14:00	SM9223B	SH	
Oct-21	K DuBaere	10/12/2021	10/12/2021	7:55	121101103.02	Effluent (Grab)	17.8'oC	10/12/2021	11:30	BOD	19	mg/l	10/13/2021	13:00	SM5210B	SUB8	
Oct-21	K DuBaere	10/12/2021	10/12/2021	7:55	121101103.02	Effluent (Grab)	17.8'oC	10/12/2021	11:30	Nitrate Nitrogen	<1.0	mg/l	10/12/2021	14:42	SM4500NO3D	NH	
Oct-21	K DuBaere	10/12/2021	10/12/2021	7:55	121101103.02	Effluent (Grab)	17.8'oC	10/12/2021	11:30	pH	6.73	s.u.	10/12/2021	15:12	SM4500HB	NH	
Oct-21	K DuBaere	10/12/2021	10/12/2021	7:55	121101103.02	Effluent (Grab)	17.8'oC	10/12/2021	11:30	TSS	76	mg/l	10/14/2021	12:00	SM2540D	SUB8	
Oct-21	K DuBaere	10/19/2021	10/19/2021	11:15	121101936.01	Effluent (Grab)	13.1'oC	10/19/2021	12:25	TKN	10.6	mg/l	10/28/2021	12:00	E351.1	SUB8	
Oct-21	K DuBaere	10/19/2021	10/19/2021	11:15	121101936.01	Effluent (Grab)	13.1'oC	10/19/2021	12:25	E.Coli	6	mpn/100mL	10/19/2021	13:50	SM9223B	SH	
Oct-21	K DuBaere	10/19/2021	10/19/2021	11:15	121101936.01	Effluent (Grab)	13.1'oC	10/19/2021	12:25	BOD	17	mg/l	10/20/2021	17:00	SM5210B	SUB8	
Oct-21	K DuBaere	10/19/2021	10/19/2021	11:15	121101936.01	Effluent (Grab)	13.1'oC	10/19/2021	12:25	Nitrate Nitrogen	<1.0	mg/l	10/19/2021	13:30	SM4500NO3D	NH	
Oct-21	K DuBaere	10/19/2021	10/19/2021	11:15	121101936.01	Effluent (Grab)	13.1'oC	10/19/2021	12:25	pH	6.82	s.u.	10/19/2021	15:08	SM4500HB	NH	
Oct-21	K DuBaere	10/19/2021	10/19/2021	11:15	121101936.01	Effluent (Grab)	13.1'oC	10/19/2021	12:25	TSS	55	mg/l	10/22/2021	12:00	SM2540D	SUB8	
Dec-21	K DuBaere	8/1/2012	8/1/2012	8/17/2012	320-00056	Effluent (Grab)	12' oC	8/1/2012	800	TSS	94	mg/l	8/3/2012	1850	2540D	SB7	
Dec-21	K DuBaere	8/1/2012	8/1/2012	8/17/2012	320-00056	Effluent (Grab)	12' oC	8/1/2012	800	Nitrate Nitrogen	<1.0	mg/l	8/2/2012	1350	4500N03D	SB7	
Dec-21	K DuBaere	8/1/2012	8/1/2012	8/17/2012	320-00056	Effluent (Grab)	12' oC	8/1/2012	800	pH	6.42	s.u.	8/2/2012	1710	4500HB	SB7	

May-22	K DuBaere	5/23/2022	5/23/2022	11:10	122052148.01	Effluent (Grab)	18.6'oC	5/23/2022	9:40	TKN	N/A	mg/L	N/A	N/A	E351.1	SUB8	
May-22	K DuBaere	5/23/2022	5/23/2022	11:10	122052148.01	Effluent (Grab)	18.6'oC	5/23/2022	9:40	E.Coli	4	mpn/100mL	5/24/2022	11:00	SM 9223B	KLW	
May-22	K DuBaere	5/23/2022	5/23/2022	11:10	122052148.01	Effluent (Grab)	18.6'oC	5/23/2022	9:40	BOD	7.2	mg/L	5/23/2022	16:35	SM 5210B	SUB8	
May-22	K DuBaere	5/23/2022	5/23/2022	11:10	122052148.01	Effluent (Grab)	18.6'oC	5/23/2022	9:40	Nitrate Nitrogen	<1.0	mg/L	5/23/2022	12:52	SM 4500 NO3 D	NH	
May-22	K DuBaere	5/23/2022	5/23/2022	11:10	122052148.01	Effluent (Grab)	18.6'oC	5/23/2022	9:40	pH	6.38	s.u.	5/23/2022	12:40	SM 4500HB	NH	
May-22	K DuBaere	5/23/2022	5/23/2022	11:10	122052148.01	Effluent (Grab)	18.6'oC	5/23/2022	9:40	TSS	40	mg/L	5/25/2022	12:00	SM 2540D	SUB8	
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.02	Effluent (Grab)	8'oC	6/1/2022	7:50	TKN	9.58	mg/L	6/4/2022	12:00	E351.1	SUB8	
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.02	Effluent (Grab)	8'oC	6/1/2022	7:50	E.Coli	2	mpn/100mL	6/1/2022	17:15	SM 9223B	KF	
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.02	Effluent (Grab)	8'oC	6/1/2022	7:50	BOD	<4.2	mg/L	6/2/2022	13:05	SM 5210B	SUB8	
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.02	Effluent (Grab)	8'oC	6/1/2022	7:50	Nitrate Nitrogen	<1.0	mg/L	6/1/2022	17:25	SM 4500 NO3 D	NH	
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.02	Effluent (Grab)	8'oC	6/1/2022	7:50	pH	6.96	s.u.	6/1/2022	17:20	SM 4500HB	NH	
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.02	Effluent (Grab)	8'oC	6/1/2022	7:50	TSS	<17	mg/L	6/3/2022	12:00	SM 2540D	SUB8	
Jun-22	K DuBaere	6/15/2022	6/15/2022	12:15	122061459.01	Effluent (Grab)	22'oC	6/15/2022	7:30	TKN	22.2	mg/L	6/21/2022	12:00	E351.1	SUB8	
Jun-22	K DuBaere	6/15/2022	6/15/2022	12:15	122061459.01	Effluent (Grab)	22'oC	6/15/2022	7:30	E.Coli	53	mpn/100mL	6/15/2022	14:00	SM 9223B	KLW	
Jun-22	K DuBaere	6/15/2022	6/15/2022	12:15	122061459.01	Effluent (Grab)	22'oC	6/15/2022	7:30	BOD	10	mg/L	6/15/2022	15:49	SM 5210B	SUB8	
Jun-22	K DuBaere	6/15/2022	6/15/2022	12:15	122061459.01	Effluent (Grab)	22'oC	6/15/2022	7:30	Nitrate Nitrogen	<1.0	mg/L	6/15/2022	17:08	SM 4500 NO3 D	NH	
Jun-22	K DuBaere	6/15/2022	6/15/2022	12:15	122061459.01	Effluent (Grab)	22'oC	6/15/2022	7:30	pH	6.96	s.u.	6/15/2022	15:40	SM 4500HB	NH	
Jun-22	K DuBaere	6/15/2022	6/15/2022	12:15	122061459.01	Effluent (Grab)	22'oC	6/15/2022	7:30	TSS	23	mg/L	6/16/2022	12:00	SM 2540D	SUB8	
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.02	Effluent (Grab)	5.4'oc	7/6/2022	8:00	TKN	10.5	mg/L	7/12/2022	12:00	E351.1	RC	
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.02	Effluent (Grab)	5.4'oc	7/6/2022	8:00	E.Coli	<1	mpn/100mL	7/6/2022	16:45	SM 9223B	KF	
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.02	Effluent (Grab)	5.4'oc	7/6/2022	8:00	BOD	<3.9	mg/L	7/12/2022	15:35	SM 5210B	SUB8	
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.02	Effluent (Grab)	5.4'oc	7/6/2022	8:00	Nitrate Nitrogen	<1.0	mg/L	7/6/2022	17:10	SM 4500 NO3 D	NH	
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.02	Effluent (Grab)	5.4'oc	7/6/2022	8:00	pH	6.84	s.u.	7/6/2022	17:06	SM 4500HB	NH	
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.02	Effluent (Grab)	5.4'oc	7/6/2022	8:00	TSS	14	mg/L	7/8/2022	12:00	SM 2540D	RC	
Jul-22	K DuBaere	7/19/2022	7/19/2022	7:50	122071607.01	Effluent (Grab)	23.2'oC	7/19/2022	7:45	TKN	11.9	mg/L	7/23/2022	12:00	E351.1	SUB8	
Jul-22	K DuBaere	7/19/2022	7/19/2022	7:50	122071607.01	Effluent (Grab)	23.2'oC	7/19/2022	7:45	E.Coli	52	mpn/100mL	7/19/2022	16:00	SM 9223B	KLW	
Jul-22	K DuBaere	7/19/2022	7/19/2022	7:50	122071607.01	Effluent (Grab)	23.2'oC	7/19/2022	7:45	BOD	13	mg/L	7/20/2022	15:05	SM 5210B	SUB8	
Jul-22	K DuBaere	7/19/2022	7/19/2022	7:50	122071607.01	Effluent (Grab)	23.2'oC	7/19/2022	7:45	Nitrate Nitrogen	<1.0	mg/L	7/19/2022	12:25	SM 4500 NO3 D	NH	
Jul-22	K DuBaere	7/19/2022	7/19/2022	7:50	122071607.01	Effluent (Grab)	23.2'oC	7/19/2022	7:45	pH	7.1	s.u.	7/19/2022	15:45	SM 4500HB	NH	
Jul-22	K DuBaere	7/19/2022	7/19/2022	7:50	122071607.01	Effluent (Grab)	23.2'oC	7/19/2022	7:45	TSS	44	mg/L	7/21/2022	12:00	SM 2540D	SUB8	
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.01	Effluent (Grab)	6'oC	8/3/2022	8:15	TKN	11.0	mg/L	8/6/2022	12:00	E351.1	SUB8	
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.01	Effluent (Grab)	6'oC	8/3/2022	8:15	E.Coli	548	mpn/100mL	8/3/2022	17:00	SM 9223B	KLW	
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.01	Effluent (Grab)	6'oC	8/3/2022	8:15	BOD	24	mg/L	8/4/2022	15:20	SM 5210B	SUB8	
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.01	Effluent (Grab)	6'oC	8/3/2022	8:15	Nitrate Nitrogen	<1.0	mg/L	8/3/2022	15:23	SM 4500 NO3 D	NH	
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.01	Effluent (Grab)	6'oC	8/3/2022	8:15	pH	6.64	s.u.	8/3/2022	16:35	SM 4500HB	NH	
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.02	Effluent (Grab)	6'oC	8/3/2022	8:15	TSS	67.0	mg/L	8/5/2022	12:00	SM 2540D	SUB8	
Aug-22	K DuBaere	8/17/2022	8/17/2022	10:00	122081876.01	Effluent (Grab)	21.4'oC	8/17/2022	7:20	TKN	12	mg/L	8/19/2022	12:00	E351.1	RC	
Aug-22	K DuBaere	8/17/2022	8/17/2022	10:00	122081876.01	Effluent (Grab)	21.4'oC	8/17/2022	7:20	E.Coli	2420	mpn/100mL	8/17/2022	13:30	SM 9223B	KLW	
Aug-22	K DuBaere	8/17/2022	8/17/2022	10:00	122081876.01	Effluent (Grab)	21.4'oC	8/17/2022	7:20	BOD	16	mg/L	8/17/2022	15:41	SM 5210B	RC	
Aug-22	K DuBaere	8/17/2022	8/17/2022	10:00	122081876.01	Effluent (Grab)	21.4'oC	8/17/2022	7:20	Nitrate Nitrogen	<1.0	mg/L	8/17/2022	13:14	SM 4500 NO3 D	NH	
Aug-22	K DuBaere	8/17/2022	8/17/2022	10:00	122081876.01	Effluent (Grab)	21.4'oC	8/17/2022	7:20	pH	6.95	s.u.	8/17/2022	13:25	SM 4500HB	NH	
Aug-22	K DuBaere	8/17/2022	8/17/2022	10:00	122081876.01	Effluent (Grab)	21.4'oC	8/17/2022	7:20	TSS	46.0	mg/L	8/18/2022	12:00	SM 2540D	RC	
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.02	Effluent (Grab)	8' oC	9/7/2022	10:05	TKN	0.84	mg/L	9/14/2022	12:00	E351.1	SUB8	
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.02	Effluent (Grab)	8' oC	9/7/2022	10:05	E.Coli	88	mpn/100mL	9/7/2022	16:25	SM 9223B	KF	
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.02	Effluent (Grab)	8' oC	9/7/2022	10:05	BOD	5.7	mg/L	9/8/2022	18:12	SM 5210B	SUB8	
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.02	Effluent (Grab)	8' oC	9/7/2022	10:05	Nitrate Nitrogen	<1.0	mg/L	9/7/2022	16:20	SM 4500 NO3 D	SR	
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.02	Effluent (Grab)	8' oC	9/7/2022	10:05	pH	6.73	s.u.	9/7/2022	17:00	SM 4500HB	NH	
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.02	Effluent (Grab)	8' oC	9/7/2022	10:05	TSS	110	mg/L	9/12/2022	12:00	SM 2540D	SUB8	
Sep-22	K DuBaere	9/22/2022	9/22/2022	10:00	122092144.01	Effluent (Grab)	21.7' oC	9/22/2022	8:05	TKN	11.4	mg/L	9/30/2022	12:00	E351.1	SUB8	
Sep-22	K DuBaere	9/22/2022	9/22/2022	10:00	122092144.01	Effluent (Grab)	21.7' oC	9/22/2022	8:05	E.Coli	38	mpn/100mL	9/22/2022	12:44	SM 9223B	SR	
Sep-22	K DuBaere	9/22/2022	9/22/2022	10:00	122092144.01	Effluent (Grab)	21.7' oC	9/22/2022	8:05	BOD	12	mg/L	9/23/2022	14:00	SM 5210B	SUB8	
Sep-22	K DuBaere	9/22/2022	9/22/2022	10:00	122092144.01	Effluent (Grab)	21.7' oC	9/22/2022	8:05	Nitrate Nitrogen	<1.0	mg/L	9/22/2022	12:30	SM 4500 NO3 D	KF	
Sep-22	K DuBaere	9/22/2022	9/22/2022	10:00	122092144.01	Effluent (Grab)	21.7' oC	9/22/2022	8:05	pH	6.93	s.u.	9/22/2022	16:28	SM 4500HB	SH	
Sep-22	K DuBaere	9/22/2022	9/22/2022	10:00	122092144.01	Effluent (Grab)	21.7' oC	9/22/2022	8:05	TSS	60	mg/L	9/27/2022	12:00	SM 2540D	SUB8	
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.02	Effluent (Grab)	9.5' oC	10/5/2022	12:05	TKN	7.55	mg/L	10/13/2022	12:00	E351.1	SUB8	
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.02	Effluent (Grab)	9.5' oC	10/5/2022	12:05	E.Coli	17	mpn/100mL	10/5/2022	16:35	SM 9223B	SR	
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.02	Effluent (Grab)	9.5' oC	10/5/2022	12:05	BOD	15	mg/L	10/7/2022	10:30	SM 5210B	SUB8	
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.02	Effluent (Grab)	9.5' oC	10/5/2022	12:05	Nitrate Nitrogen	<1.0	mg/L	10/5/2022	16:05	SM 4500 NO3 D	NH	
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.02	Effluent (Grab)	9.5' oC	10/5/2022	12:05	pH	6.79	s.u.	10/5/2022	15:55	SM 4500HB	NH	
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.02	Effluent (Grab)	9.5' oC	10/5/2022	12:05	TSS	57	mg/L	10/10/2022	12:00	SM 2540D	SUB8	
Oct-22	K DuBaere	10/19/2022	10/19/2022	9:00	122101844.01	Effluent (Grab)	14 oC	10/19/2022	7:25	TKN	37.8	mg/L	10/26/2022	12:00	E351.1	SUB8	
Oct-22	K DuBaere	10/19/2022	10/19/2022	9:00	122101844.01	Effluent (Grab)	14 oC	10/19/2022	7:25	E.Coli	28	mpn/100mL	10/19/2022	10:40	SM 9223B	SR	
Oct-22	K DuBaere	10/19/2022	10/19/2022	9:00	122101844.01	Effluent (Grab)	14 oC	10/19/2022	7:25	BOD	110	mg/L	10/20/2022	14:30	SM 5210B	SUB8	
Oct-22	K DuBaere	10/19/2022	10/19/2022	9:00	122101844.01	Effluent (Grab)	14 oC	10/19/2022	7:25	Nitrate Nitrogen	<1.0	mg/L	10/19/2022	11:55	SM 4500 NO3 D	NH	
Oct-22	K DuBaere	10/19/2022	10/19/2022	9:00	122101844.01	Effluent (Grab)	14 oC	10/19/2022	7:25	pH	6.65	s.u.	10/19/2022	12:40	SM 4500HB	NH	
Oct-22	K DuBaere	10/19/2022	10/19/2022	9:00	122101844.01	Effluent (Grab)	14 oC	10/19/2022	7:25	TSS	170	mg/L	10/24/2022	12:00	SM 2540D	SUB8	
Jan-18	K DuBaere	1/10/2018	1/10/2018	2:10	118010589.01	Influent (Grab)	10'oC	1/10/2018	9:40	BOD	87	mg/l	1/12/2018	8:30	SM 5210B		SUB2
Jan-18	K DuBaere	1/10/2018	1/10/2018	2:10	118010589.01	Influent (Grab)	10'oC	1/10/2018	9:40	pH	7.42	s.u.	1/11/2018	16:00	SM 4500HB		SUB2
Jan-18	K DuBaere	1/10/2018	1/10/2018	2:10	118010589.01	Influent (Grab)	10'oC	1/10/2018	9:40	TSS	54	mg/l	1/16/2018	16:30	SM 2540D		SUB2

Feb-18	K DuBaere	2/8/2018	2/8/2018	11:45	118020596.01	Influent (Grab)	10'oC	2/8/2018	8:30	BOD	300	mg/l	2/9/2018	10:50	SM 5210B		SUB2
Feb-18	K DuBaere	2/8/2018	2/8/2018	11:45	118020596.01	Influent (Grab)	10'oC	2/8/2018	8:30	pH	7.2	s.u.	2/9/2018	16:05	SM 4500HB		SUB2
Feb-18	K DuBaere	2/8/2018	2/8/2018	11:45	118020596.01	Influent (Grab)	10'oC	2/8/2018	**8:30**	TSS	74	mg/l	2/13/2018	15:00	SM 2540D		SUB2
Mar-18	K DuBaere	3/19/2018	3/19/2018	10:35	118031402.01	Influent (Grab)	14.4oC	3/19/2018	8:40	BOD	390	mg/l	3/20/2018	10:45	SM 5210B		SUB2
Mar-18	K DuBaere	3/19/2018	3/19/2018	10:35	118031402.01	Influent (Grab)	14.4oC	3/19/2018	8:40	pH	8.31	s.u.	3/20/2018	10:45	SM 4500HB		SUB2
Mar-18	K DuBaere	3/19/2018	3/19/2018	10:35	118031402.01	Influent (Grab)	14.4oC	3/19/2018	8:40	TSS	66	mg/l	3/22/2018	12:10	SM 2540D		SUB2
Apr-18	K DuBaere	4/4/2018	4/4/2018	2:05	118040361.01	Influent (Grab)	9.4oC	4/4/2018	7:50	BOD	380	mg/l	4/5/2018	16:00	SM 5210B		SUB2
Apr-18	K DuBaere	4/4/2018	4/4/2018	2:05	118040361.01	Influent (Grab)	9.4oC	4/4/2018	7:50	pH	6.99	s.u.	4/5/2018	16:16	SM 4500HB		SUB2
Apr-18	K DuBaere	4/4/2018	4/4/2018	2:05	118040361.01	Influent (Grab)	9.4oC	4/4/2018	7:50	TSS	72	mg/l	4/6/2018	14:10	SM 2540D		SUB2
May-18	K DuBaere	5/2/2018	5/2/2018	2:30	118050252.01	Influent (Grab)	10'oC	5/2/2018	8:10	BOD	460	mg/l	5/3/2018	14:30	SM 5210B		SUB2
May-18	K DuBaere	5/2/2018	5/2/2018	2:30	118050252.01	Influent (Grab)	10'oC	5/2/2018	8:10	pH	6.51	s.u.	5/3/2018	15:40	SM 4500HB		SUB2
May-18	K DuBaere	5/2/2018	5/2/2018	2:30	118050252.01	Influent (Grab)	10'oC	5/2/2018	8:10	TSS	100	mg/l	5/7/2018	13:10	SM 2540D		SUB2
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.01	Influent (Grab)	10.6oC	6/13/2018	7:20	BOD	36	mg/l	6/14/2018	16:30	SM 5210B	6	SUB2
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.01	Influent (Grab)	10.6oC	6/13/2018	7:20	pH	6.75	s.u.	6/14/2018	16:45	SM 4500HB	N/A	SUB2
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.01	Influent (Grab)	10.6oC	6/13/2018	7:20	TSS	140	mg/l	6/20/2018	13:40	SM 2540D	10	SUB2
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.02	Influent (Grab)	10.6oC	6/13/2018	7:25	Nitrate Nitrogen	210	mg/l	6/14/2018	16:00	SM 4500 NO3 D	1	SUB2
Jun-18	K DuBaere	6/13/2018	6/13/2018	1:45	118061561.02	Influent (Grab)	10.6oC	6/13/2018	7:25	pH	78	SU	6/14/2018	16:45	SM 4500HB	N/A	SUB2
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.01	Influent (Grab)	15oC	7/11/2018	7:30	BOD	140	mg/l	7/13/2018	9:00	SM 5210B	6	SUB2
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.01	Influent (Grab)	15oC	7/11/2018	7:30	pH	6.67	s.u.	7/12/2018	16:10	SM 4500HB	N/A	SUB2
Jul-18	K DuBaere	7/11/2018	7/11/2018	2:30	118070961.01	Influent (Grab)	15oC	7/11/2018	7:30	TSS	35	mg/l	7/17/2018	17:00	SM 2540D	10	SUB2
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.01	Influent (Grab)	6 oC	8/8/2018	7:45	BOD	120	mg/l	8/9/2018	16:30	SM 5210B	6	SUB2
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.01	Influent (Grab)	6 oC	8/8/2018	7:45	pH	7.82	s.u.	8/9/2018	16:40	SM 4500HB	N/A	SUB2
Aug-18	K DuBaere	8/8/2018	8/8/2018	1:00	118080907.01	Influent (Grab)	6 oC	8/8/2018	7:45	TSS	48	mg/l	8/15/2018	18:40	SM 2540D	10	SUB2
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.01	Influent (Grab)	Oc	9/5/2018	8:20	BOD	110	mg/l	9/6/2018	16:00	SM 5210B	6	SUB2
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.01	Influent (Grab)	Oc	9/5/2018	8:20	pH	7.19	s.u.	9/6/2018	16:40	SM 4500HB	N/A	SUB2
Sep-18	K DuBaere	9/5/2018	9/5/2018	2:40	118090308.01	Influent (Grab)	Oc	9/5/2018	8:20	TSS	60	mg/l	9/10/2018	16:30	SM 2540D	10	SUB2
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.01	Influent (Grab)	3.9 oC	10/3/2018	11:20	BOD	205	mg/l	10/4/2018	16:00	SM 5210B	6	SUB2
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.01	Influent (Grab)	3.9 oC	10/3/2018	11:20	pH	6.76	s.u.	10/4/2018	14:16	SM 4500HB	N/A	SUB2
Oct-18	K DuBaere	10/3/2018	10/3/2018	1:40	118100383.01	Influent (Grab)	3.9 oC	10/3/2018	11:20	TSS	112	mg/l	10/5/2018	15:10	SM 2540D	10	SUB2
Nov-18	K DuBaere	11/7/2018	11/7/2018	2:10	118110660.01	Influent (Grab)	9.6 oC	11/7/2018	7:00	BOD	53	mg/l	11/8/2018	16:00	SM 5210B	6	SUB2
Nov-18	K DuBaere	11/7/2018	11/7/2018	2:10	118110660.01	Influent (Grab)	9.6 oC	11/7/2018	7:00	pH	6.84	s.u.	11/8/2018	16:55	SM 4500HB	N/A	SUB2
Nov-18	K DuBaere	11/7/2018	11/7/2018	2:10	118110660.01	Influent (Grab)	9.6 oC	11/7/2018	7:00	TSS	19	mg/l	11/13/2018	17:00	SM 2540D	10	SUB2
Dec-18	K DuBaere	12/5/2018	12/5/2018	1:35	118120374.01	Influent (Grab)	8.9 oC	12/6/2018	11:30	BOD	91	mg/l	12/6/2018	15:00	SM 5210B	6	SUB2
Dec-18	K DuBaere	12/5/2018	12/5/2018	1:35	118120374.01	Influent (Grab)	8.9 oC	12/6/2018	11:30	pH	7.07	s.u.	12/6/2018	15:30	SM 4500HB	N/A	SUB2
Dec-18	K DuBaere	12/5/2018	12/5/2018	1:35	118120374.01	Influent (Grab)	8.9 oC	12/6/2018	11:30	TSS	10	mg/l	12/10/2018	10:30	SM 2540D	10	SUB2
Jan-19	K DuBaere	1/2/2019	1/2/2019	2:30	119010044	Influent (Grab)	9.2	1/2/2019	11:20	BOD	400	mg/l	1/3/2019	16:30	SM 5210B	SUB2	
Jan-19	K DuBaere	1/2/2019	1/2/2019	2:30	119010044	Influent (Grab)	9.2	1/2/2019	11:20	pH	7.37	s.u.	1/3/2019	15:46	SM 4500HB	SUB2	
Jan-19	K DuBaere	1/2/2019	1/2/2019	2:30	119010044	Influent (Grab)	9.2	1/2/2019	11:20	TSS	40	mg/l	1/4/2019	15:30	SM 2540D	SUB2	
Feb-19	K DuBaere	2/8/2019	2/8/2019	10:29	119020627.01	Influent (Grab)	7.6	2/8/2019	9:15	BOD	160	mg/l	2/8/2019	15:00	SM 5210B	SUB2	
Feb-19	K DuBaere	2/8/2019	2/8/2019	10:29	119020627.01	Influent (Grab)	7.6	2/8/2019	9:15	pH	6.96	s.u.	2/8/2019	16:25	SM 4500HB	SUB2	
Feb-19	K DuBaere	2/8/2019	2/8/2019	10:29	119020627.01	Influent (Grab)	7.6	2/8/2019	9:15	TSS	33	mg/l	2/14/2019	13:00	SM 2540D	SUB2	
Mar-19	K DuBaere	3/6/2019	3/6/2019	12:35	119030419.01	Influent (Grab)	11'oC	3/6/2019	9:55	BOD	380	mg/l	3/7/2019	14:00	SM 5210B	SUB2	
Mar-19	K DuBaere	3/6/2019	3/6/2019	12:35	119030419.01	Influent (Grab)	11'oC	3/6/2019	9:55	pH	6.86	s.u.	3/7/2019	16:25	SM 4500HB	SUB2	
Mar-19	K DuBaere	3/6/2019	3/6/2019	12:35	119030419.01	Influent (Grab)	11'oC	3/6/2019	9:55	TSS	40	mg/l	3/8/2019	14:20	SM 2540D	SUB2	
Apr-19	K DuBaere	4/3/2019	4/3/2019	12:44	119040349.01	Influent (Grab)	5.2'oC	4/3/2019	9:20	BOD	450	mg/l	4/4/2019	14:30	SM 5210B	SUB2	
Apr-19	K DuBaere	4/3/2019	4/3/2019	12:44	119040349.01	Influent (Grab)	5.2'oC	4/3/2019	9:20	pH	6.8	s.u.	4/4/2019	16:30	SM 4500HB	SUB2	
Apr-19	K DuBaere	4/3/2019	4/3/2019	12:44	119040349.01	Influent (Grab)	5.2'oC	4/3/2019	9:20	TSS	82	mg/l	4/5/2019	16:45	SM 2540D	SUB2	
May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.01	Influent (Grab)	6'oC	5/1/2019	7:50	BOD	140	mg/l	5/2/2019	14:30	SM 5210B	SUB2	
May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.01	Influent (Grab)	6'oC	5/1/2019	7:50	pH	6.92	s.u.	5/1/2019	16:50	SM 4500HB	SUB2	
May-19	K DuBaere	5/1/2019	5/1/2019	12:40	119050066.01	Influent (Grab)	6'oC	5/1/2019	7:50	TSS	124	mg/l	5/3/2019	17:45	SM 2540D	SUB2	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.01	Influent (Grab)	7'oC	6/11/2019	11:45	BOD	220	mg/l	6/12/2019	11:30	SM 5210B	SUB2	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.01	Influent (Grab)	7'oC	6/11/2019	11:45	pH	6.73	s.u.	6/12/2019	16:30	SM 4500HB	SUB2	
Jun-19	K DuBaere	6/11/2019	6/11/2019	1:23	119061272.01	Influent (Grab)	7'oC	6/11/2019	11:45	TSS	84	mg/l	6/13/2019	14:00	SM 2540D	SUB2	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.01	Influent (Grab)	22.8' oC	7/2/2019	9:30	BOD	190	mg/l	7/3/2019	17:00	5210B	SUB2	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.01	Influent (Grab)	22.8' oC	7/2/2019	9:30	pH	6.83	s.u.	7/3/2019	17:37	SM 4500HB	SUB2	
Jul-19	K DuBaere	7/2/2019	7/2/2019	12:40	119070276.01	Influent (Grab)	22.8' oC	7/2/2019	9:30	TSS	75.00	mg/l	7/3/2019	18:30	2540D	SUB2	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.01	Influent (Grab)	21'oC	8/7/2019	9:55	BOD	66	mg/l	8/8/2019	11:30	5210B	SUB2	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.01	Influent (Grab)	21'oC	8/7/2019	9:55	pH	6.87	s.u.	8/8/2019	12:44	SM 4500HB	SUB2	
Aug-19	K DuBaere	8/7/2019	8/7/2019	1:10	119080777.01	Influent (Grab)	21'oC	8/7/2019	9:55	TSS	40	mg/l	8/8/2019	14:00	2540D	SUB2	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.01	Influent (Grab)	10' Oc	9/4/2019	7:35	BOD	270	mg/l	9/5/2019	12:00	SM 5210B	SUB2	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.01	Influent (Grab)	10' Oc	9/4/2019	7:35	pH	6.93	s.u.	9/5/2019	12:15	SM 4500HB	SUB2	
Sep-19	K DuBaere	9/4/2019	9/4/2019	12:43	119090335.01	Influent (Grab)	10' Oc	9/4/2019	7:35	TSS	63	mg/l	9/6/2019	15:05	SM2540D	SUB2	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.01	Influent (Grab)	9.8' oC	10/2/2019	9:15	BOD	150	mg/l	10/3/2019	15:00	SM 5210B	SUB2	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.01	Influent (Grab)	9.8' oC	10/2/2019	9:15	pH	7.02	s.u.	10/3/2019	16:16	SM 4500HB	SUB2	
Oct-19	K DuBaere	10/2/2019	10/2/2019	12:20	119100264.01	Influent (Grab)	9.8' oC	10/2/2019	9:15	TSS	40	mg/l	10/4/2019	20:20	SM2540D	SUB2	
Nov-19	K DuBaere	11/13/2019	11/13/2019	12:40	119111324.01	Influent (Grab)	11.1 oC	11/13/2019	10:55	BOD	31	mg/l	11/14/2019	14:00	SM 5210B	SUB2	
Nov-19	K DuBaere	11/13/2019	11/13/2019	12:40	119111324.01	Influent (Grab)	11.1 oC	11/13/2019	10:55	pH	7.33	s.u.	11/13/2019	16:30	SM 4500HB	SUB2	
Nov-19	K DuBaere	11/13/2019	11/13/2019	12:40	119111324.01	Influent (Grab)	11.1 oC	11/13/2019	10:55	TSS	14	mg/l	11/14/2019	18:00	SM 2540D	SUB2	
Dec-19	K DuBaere	12/4/2019	12/4/2019	2:00	119120227.01	Influent (Grab)	5.0 oC	12/4/2019	11:55	BOD	38	mg/l	12/5/2019	15:00	SM 5210B	SUB2	

Dec-19	K DuBaere	12/4/2019	12/4/2019	2:00	119120227.01	Influent (Grab)	5.0 oC	12/4/2019	11:55	pH	6.76	s.u.	12/5/2019	15:26	SM 4500HB	SUB2
Dec-19	K DuBaere	12/4/2019	12/4/2019	2:00	119120227.01	Influent (Grab)	5.0 oC	12/4/2019	11:55	TSS	32	mg/l	12/9/2019	17:50	SM2540D	SUB2
Jan-20	K Dubaere	1/8/2020	1/8/2020	12:45	120010499.01	Influent (Grab)	4.3'oC	1/8/2020	11:00	BOD	300	mg/l	1/9/2020	15:00	SM 5210B	LAM
Jan-20	K Dubaere	1/8/2020	1/8/2020	12:45	120010499.01	Influent (Grab)	4.3'oC	1/8/2020	11:00	pH	7.22	s.u.	1/9/2020	15:25	SM 4500HB	LAM
Jan-20	K Dubaere	1/8/2020	1/8/2020	12:45	120010499.01	Influent (Grab)	4.3'oC	1/8/2020	11:00	TSS	52	mg/l	1/10/2020	13:37	SM 2540D	LAM
Feb-20	K Dubaere	2/5/2020	2/5/2020	12:45	120020377.01	Influent (Grab)	8.1'oC	2/5/2020	12:45	BOD	300	mg/l	2/6/2020	13:45	SM 5210B	LAM
Feb-20	K Dubaere	2/5/2020	2/5/2020	12:45	120020377.01	Influent (Grab)	8.1'oC	2/5/2020	12:45	pH	7.05	s.u.	2/6/2020	11:52	SM 4500HB	LAM
Feb-20	K Dubaere	2/5/2020	2/5/2020	12:45	120020377.01	Influent (Grab)	8.1'oC	2/5/2020	12:45	TSS	112	mg/l	2/10/2020	13:26	SM 2540D	LAM
Mar-20	K Dubaere	3/5/2020	3/5/2020	1:50	120030479.01	Influent (Grab)	10.8'oC	3/5/2020	10:35	BOD	270	mg/l	3/6/2020	15:05	SM 5210B	LAM
Mar-20	K Dubaere	3/5/2020	3/5/2020	1:50	120030479.01	Influent (Grab)	10.8'oC	3/5/2020	10:35	pH	6.84	s.u.	3/6/2020	15:10	SM 4500HB	LAM
Mar-20	K Dubaere	3/5/2020	3/5/2020	1:50	120030479.01	Influent (Grab)	10.8'oC	3/5/2020	10:35	TSS	48	mg/l	3/10/2020	14:21	SM 2540D	LAM
Apr-20	K Dubaere	4/1/2020	4/1/2020	1:50	120040051.01	Influent (Grab)	7.1'oC	4/1/2020	12:25	BOD	6	mg/l	4/2/2020	14:30	SM 5210B	SUB2
Apr-20	K Dubaere	4/1/2020	4/1/2020	1:50	120040051.01	Influent (Grab)	7.1'oC	4/1/2020	12:25	pH	N/A	s.u.	4/2/2020	16:00	SM 4500HB	SUB2
Apr-20	K Dubaere	4/1/2020	4/1/2020	1:50	120040051.01	Influent (Grab)	7.1'oC	4/1/2020	12:25	TSS	10	mg/l	4/2/2020	16:00	SM 2540D	SUB2
May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.01	Influent (Grab)	12'oC	5/13/2020	11:00	BOD	120	mg/l	5/14/2020	12:00	SM 5210B	SUB2
May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.01	Influent (Grab)	12'oC	5/13/2020	11:00	pH	6.75	s.u.	5/14/2020	12:40	SM 4500HB	SUB2
May-20	K DuBaere	5/13/2020	5/13/2020	2:15	120051132.01	Influent (Grab)	12'oC	5/13/2020	11:00	TSS	98	mg/l	5/14/2020	10:20	SM 2540D	SUB2
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.01	Influent (Grab)	11.9'oC	6/3/2020	10:15	BOD	100	mg/l	6/5/2020	10:15	SM 5210B	SUB2
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.01	Influent (Grab)	11.9'oC	6/3/2020	10:15	pH	6.88	s.u.	6/5/2020	11:40	SM 4500HB	SUB2
Jun-20	K DuBaere	6/3/2020	6/3/2020	2:00	120060394.01	Influent (Grab)	11.9'oC	6/3/2020	10:15	TSS	100	mg/l	6/5/2020	6:30	SM 2540D	SUB2
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.01	Influent (Grab)	13.9' oC	7/1/2020	8:40	BOD	93	mg/l	7/2/2020	12:00	SM 5210B	SUB2
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.01	Influent (Grab)	13.9' oC	7/1/2020	8:40	pH	6.81	s.u.	7/1/2020	16:26	SM 4500HB	SUB2
Jul-20	K DuBaere	7/1/2020	7/1/2020	1:40	120070079.01	Influent (Grab)	13.9' oC	7/1/2020	8:40	TSS	68	mg/l	7/2/2020	12:00	SM 2540D	SUB2
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.01	Influent (Grab)	18' oC	8/5/2020	7:25	BOD	75	mg/l	8/6/2020	12:00	SM 5210B	SUB2
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.01	Influent (Grab)	18' oC	8/5/2020	7:25	pH	6.68	s.u.	8/5/2020	16:15	SM 4500HB	SUB2
Aug-20	K DuBaere	8/5/2020	8/5/2020	1:05	120080494.01	Influent (Grab)	18' oC	8/5/2020	7:25	TSS	30	mg/l	8/7/2020	18:50	SM 2540D	SUB2
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.01	Influent (Grab)	10.8' oC	9/2/2020	8:40	BOD	<60	mg/l	9/3/2020	15:00	SM 5210B	SUB2
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.01	Influent (Grab)	10.8' oC	9/2/2020	8:40	pH	6.42	s.u.	9/3/2020	16:36	SM 4500HB	SUB2
Sep-20	K DuBaere	9/2/2020	9/2/2020	2:00	120090296.01	Influent (Grab)	10.8' oC	9/2/2020	8:40	TSS	13	mg/l	9/4/2020	9:00	SM 2540D	SUB2
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.01	Influent (Grab)	15' oC	10/7/2020	12:40	BOD	16	mg/l	10/8/2020	16:07	SM 5210B	SUB2
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.01	Influent (Grab)	15' oC	10/7/2020	12:40	pH	7.32	s.u.	10/7/2020	15:45	SM 4500HB	GP
Oct-20	K DuBaere	10/7/2020	10/7/2020	2:10	120100804.01	Influent (Grab)	15' oC	10/7/2020	12:40	TSS	20.0	mg/l	10/9/2020	12:00	SM 2540D	SUB8
Nov-20	K DuBaere	11/4/2020	11/4/2020	1:30	120110417.01	Influent (Grab)	4.8' oC	11/4/2020	12:20	BOD	93	mg/l	11/5/2020	15:58	5210B	SUB8
Nov-20	K DuBaere	11/4/2020	11/4/2020	1:30	120110417.01	Influent (Grab)	4.8' oC	11/4/2020	12:20	pH	6.97	s.u.	11/4/2020	13:55	SM 4500HB	GP
Nov-20	K DuBaere	11/4/2020	11/4/2020	1:30	120110417.01	Influent (Grab)	4.8' oC	11/4/2020	12:20	TSS	20	mg/l	11/6/2020	12:00	2540D	SUB8
Dec-20	K DuBaere	12/2/2020	12/2/2020	4:40	120120286.01	Influent (Grab)	12 oC	12/2/2020	9:45	BOD	16	mg/l	12/3/2020	15:16	5210B	SUB8
Dec-20	K DuBaere	12/2/2020	12/2/2020	4:40	120120286.01	Influent (Grab)	12 oC	12/2/2020	9:45	pH	6.72	s.u.	12/3/2020	9:50	2540D	GP
Dec-20	K DuBaere	12/2/2020	12/2/2020	4:40	120120286.01	Influent (Grab)	12 oC	12/2/2020	9:45	TSS	46	mg/l	12/4/2020	12:00	4500HB	SUB8
Jan-21	K Dubaere	1/6/2021	1/6/2021	2:10	121010367.01	Influent (Grab)	2.0'oC	1/6/2021	11:10	BOD	170	mg/l	1/7/2021	15:47	SM 5210B	SUB8
Jan-21	K Dubaere	1/6/2021	1/6/2021	2:10	121010367.01	Influent (Grab)	2.0'oC	1/6/2021	11:10	pH	7.8	s.u.	1/6/2021	15:45	SM 4500HB	GP
Jan-21	K Dubaere	1/6/2021	1/6/2021	2:10	121010367.01	Influent (Grab)	2.0'oC	1/6/2021	11:10	TSS	54	mg/l	1/8/2021	12:00	SM 2540D	SUB8
Feb-21	K Dubaere	2/3/2021	2/3/2021	1:15	121020266.01	Influent (Grab)	10.3'oC	2/3/2021	10:30	BOD	170	mg/l	2/4/2021	16:21	SM 5210B	SUB8
Feb-21	K Dubaere	2/3/2021	2/3/2021	1:15	121020266.01	Influent (Grab)	10.3'oC	2/3/2021	10:30	pH	8.14	s.u.	2/3/2021	14:45	SM 4500HB	GP
Feb-21	K Dubaere	2/3/2021	2/3/2021	1:15	121020266.01	Influent (Grab)	10.3'oC	2/3/2021	10:30	TSS	120	mg/l	2/5/2021	12:00	SM 2540D	SUB8
Mar-21	K Dubaere	3/3/2021	3/3/2021	1:20	121030384.01	Influent (Grab)	6.0'oC	3/3/2021	8:45	BOD	320	mg/l	3/4/2021	16:05	SM 5210B	SUB8
Mar-21	K Dubaere	3/3/2021	3/3/2021	1:20	121030384.01	Influent (Grab)	6.0'oC	3/3/2021	8:45	pH	7.36	s.u.	3/3/2021	13:50	SM 4500HB	GP
Mar-21	K Dubaere	3/3/2021	3/3/2021	1:20	121030384.01	Influent (Grab)	6.0'oC	3/3/2021	8:45	TSS	44	mg/l	3/5/2021	12:00	SM 2540D	SUB8
Apr-21	K Dubaere	4/7/2021	4/7/2021	1:10	121040665.01	Influent (Grab)	9.6'oC	4/7/2021	9:45	BOD	230	mg/l	4/8/2021	15:16	SM 5210B	SUB8
Apr-21	K Dubaere	4/7/2021	4/7/2021	1:10	121040665.01	Influent (Grab)	9.6'oC	4/7/2021	9:45	pH	7.22	s.u.	4/7/2021	15:48	SM 4500HB	NH
Apr-21	K Dubaere	4/7/2021	4/7/2021	1:10	121040665.01	Influent (Grab)	9.6'oC	4/7/2021	9:45	TSS	41	mg/l	4/12/2021	12:00	SM 2540D	SUB8
May-21	K DuBaere	5/5/2021	5/5/2021	2:00	121050473.01	Influent (Grab)		5/5/2021	11:20	BOD	95	mg/l	5/6/2021	15:53	SM 5210B	SUB8
May-21	K DuBaere	5/5/2021	5/5/2021	2:00	121050473.01	Influent (Grab)		5/5/2021	11:20	pH	7.26	s.u.	5/5/2021	16:07	SM 4500HB	NH
May-21	K DuBaere	5/5/2021	5/5/2021	2:00	121050473.01	Influent (Grab)		5/5/2021	11:20	TSS	58	mg/l	5/7/2021	17:00	SM 2540D	SUB8
May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.01	Influent (Grab)	17'oC	5/19/2021	7:35	BOD	160	mg/l	5/20/2021	17:54	SM 5210B	SUB8
May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.01	Influent (Grab)	17'oC	5/19/2021	7:35	pH	7.76	s.u.	5/19/2021	12:55	SM 4500HB	GP
May-21	K DuBaere	5/19/2021	5/19/2021	11:05	121051866.01	Influent (Grab)	17'oC	5/19/2021	7:35	TSS	390	mg/l	5/21/2021	12:00	SM 2540D	SUB8
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.01	Influent (Grab)	7.1'oC	6/2/2021	6:25	BOD	69	mg/l	6/3/2021	16:40	SM 5210B	SUB8
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.01	Influent (Grab)	7.1'oC	6/2/2021	6:25	pH	7.20	s.u.	6/2/2021	16:10	SM 4500HB	NH
Jun-21	K DuBaere	6/2/2021	6/2/2021	2:30	121060315.01	Influent (Grab)	7.1'oC	6/2/2021	6:25	TSS	210	mg/l	6/4/2021	12:00	SM 2540D	SUB8
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.01	Influent (Grab)	12'oc	7/7/2021	7:50	BOD	200	mg/l	7/8/2021	17:54	SM 5210B	SUB8
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.01	Influent (Grab)	12'oc	7/7/2021	7:50	pH	7.00	s.u.	7/7/2021	15:10	SM 4500HB	NH
Jul-21	K DuBaere	7/7/2021	7/7/2021	2:10	121070543.01	Influent (Grab)	12'oc	7/7/2021	7:50	TSS	690	mg/l	7/9/2021	12:00	SM 2540D	SUB8
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.01	Influent (Grab)	5' oC	8/4/2021	7:55	BOD	40	mg/l	8/5/2021	17:25	SM 5210B	SUB8
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.01	Influent (Grab)	5' oC	8/4/2021	7:55	pH	7.46	s.u.	8/4/2021	16:03	SM 4500HB	NH
Aug-21	K DuBaere	8/4/2021	8/4/2021	2:00	121080484.01	Influent (Grab)	5' oC	8/4/2021	7:55	TSS	360	mg/l	8/6/2021	12:00	SM 2540D	SUB8
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.01	Influent (Grab)	5.9'oC	9/1/2021	8:05	BOD	31	mg/l	9/2/2021	16:45	SM 5210B	SUB8
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.01	Influent (Grab)	5.9'oC	9/1/2021	8:05	pH	7.26	s.u.	9/1/2021	16:41	SM 4500HB	NH
Sep-21	K DuBaere	9/1/2021	9/1/2021	2:30	121090105.01	Influent (Grab)	5.9'oC	9/1/2021	8:05	TSS	130	mg/l	9/7/2021	12:00	SM 2540D	SUB8
Oct-21	K DuBaere	10/12/2021	10/12/2021	11:30	121101103.01	Influent (Grab)	17.8'oC	10/12/2021	7:50	BOD	70	mg/l	10/13/2021	13:00	SM 5210B	SUB8

Oct-21	K DuBaere	10/12/2021	10/12/2021	11:30	121101103.01	Influent (Grab)	17.8'oC	10/12/2021	7:50	pH	7.63	s.u.	10/12/2021	15:12	SM 4500HB	NH
Oct-21	K DuBaere	10/12/2021	10/12/2021	11:30	121101103.01	Influent (Grab)	17.8'oC	10/12/2021	7:50	TSS	65	mg/l	10/14/2021	12:00	SM 2540D	SUB8
Nov-21	K DuBaere	11/3/2021	11/3/2021	1:05	121110362.01	Influent (Grab)	6' oC	11/3/2021	8:25	BOD	<4.6	mg/l	11/4/2021	15:31	SM 5210B	SUB8
Nov-21	K DuBaere	11/3/2021	11/3/2021	1:05	121110362.01	Influent (Grab)	6' oC	11/3/2021	8:25	pH	7.31	s.u.	11/3/2021	15:30	SM 4500HB	NH
Nov-21	K DuBaere	11/3/2021	11/3/2021	1:05	121110362.01	Influent (Grab)	6' oC	11/3/2021	8:25	TSS	17	mg/l	11/8/2021	12:00	SM 2540D	SUB8
Dec-21	K DuBaere	12/1/2021	12/1/2021	2:00	121120102.01	Influent (Grab)	13.2' oC	12/1/2021	11:40	BOD	35	mg/l	12/2/2021	14:20	SM 5210B	SUB8
Dec-21	K DuBaere	12/1/2021	12/1/2021	2:00	121120102.01	Influent (Grab)	13.2' oC	12/1/2021	11:40	pH	7.17	s.u.	12/1/2021	17:05	SM 4500HB	NH
Dec-21	**K DuBaere**	**12/1/2021**	**12/1/2021**	**2:00**	**121120102.01**	**Influent (Grab)**	**13.2' oC**	**12/1/2021**	**11:40**	**TSS**	**74**	**mg/l**	**12/3/2021**	**12:00**	**SM 2540D**	**SUB8**
Jan-22	K Dubaere	1/6/2022	1/6/2022	10:45	122010416.01	Influent (Grab)	11.3'oC	1/6/2022	9:45	BOD	71	mg/l	1/7/2022	13:00	SM 5210B	SUB8
Jan-22	K Dubaere	1/6/2022	1/6/2022	10:45	122010416.01	Influent (Grab)	11.3'oC	1/6/2022	9:45	pH	7.44	s.u.	1/6/2022	11:40	SM 4500HB	NH
Jan-22	K Dubaere	1/6/2022	1/6/2022	10:45	122010416.01	Influent (Grab)	11.3'oC	1/6/2022	9:45	TSS	33	mg/l	1/10/2022	12:00	SM 2540D	SUB8
Feb-22	K Dubaere	2/2/2022	2/2/2022	2:00	122020172.01	Influent (Grab)	6.0'oC	2/2/2022	10:00	BOD	190	mg/l	2/3/2022	16:09	SM 5210B	SUB8
Feb-22	K Dubaere	2/2/2022	2/2/2022	2:00	122020172.01	Influent (Grab)	6.0'oC	2/2/2022	10:00	pH	7.63	s.u.	2/2/2022	16:55	SM 4500HB	NH
Feb-22	K Dubaere	2/2/2022	2/2/2022	2:00	122020172.01	Influent (Grab)	6.0'oC	2/2/2022	10:00	TSS	87	mg/l	2/4/2022	12:00	SM 2540D	SUB8
Mar-22	K Dubaere	3/8/2022	3/8/2022	10:50	122030610.01	Influent (Grab)	11.9'oC	3/8/2022	9:00	BOD	170	mg/l	3/9/2022	13:15	SM 5210B	SUB8
Mar-22	K Dubaere	3/8/2022	3/8/2022	10:50	122030610.01	Influent (Grab)	11.9'oC	3/8/2022	9:00	pH	7.20	s.u.	3/8/2022	11:45	SM 4500HB	SH
Mar-22	K Dubaere	3/8/2022	3/8/2022	10:50	122030610.01	Influent (Grab)	11.9'oC	3/8/2022	9:00	TSS	330	mg/l	3/11/2022	12:00	SM 2540D	SUB8
Apr-22	K Dubaere	4/6/2022	4/6/2022	3:00	122040562.01	Influent (Grab)	5.9'oC	4/6/2022	7:15	BOD	320	mg/l	4/7/2022	16:44	SM 5210B	SUB8
Apr-22	K Dubaere	4/6/2022	4/6/2022	3:00	122040562.01	Influent (Grab)	5.9'oC	4/6/2022	7:15	pH	7.00	s.u.	4/6/2022	16:15	SM 4500HB	NH
Apr-22	K Dubaere	4/6/2022	4/6/2022	3:00	122040562.01	Influent (Grab)	5.9'oC	4/6/2022	7:15	TSS	490	mg/l	4/8/2022	12:00	SM 2540D	SUB8
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.01	Influent (Grab)	8'oC	6/1/2022	7:45	BOD	250	mg/l	6/2/2022	13:05	SM 5210B	SUB8
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.01	Influent (Grab)	8'oC	6/1/2022	7:45	pH	6.97	s.u.	6/1/2022	17:20	SM 4500HB	NH
Jun-22	K DuBaere	6/1/2022	6/1/2022	5:00	122060165.01	Influent (Grab)	8'oC	6/1/2022	7:45	TSS	50	mg/l	6/3/2022	12:00	SM 2540D	SUB8
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.01	Influent (Grab)	5.4'oc	7/6/2022	7:55	BOD	350	mg/l	7/12/2022	15:35	SM 5210B	SUB8
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.01	Influent (Grab)	5.4'oc	7/6/2022	7:55	pH	7.24	s.u.	7/6/2022	17:06	SM 4500HB	NH
Jul-22	K DuBaere	7/6/2022	7/6/2022	3:30	122070425.01	Influent (Grab)	5.4'oc	7/6/2022	7:55	TSS	160	mg/l	7/8/2022	12:00	SM 2540D	RC
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.01	Influent (Grab)	6'oC	8/3/2022	8:05	BOD	27	mg/l	8/4/2022	15:20	SM 5210B	SUB8
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.01	Influent (Grab)	6'oC	8/3/2022	8:05	pH	7.23	s.u.	8/3/2022	16:35	SM 4500HB	NH
Aug-22	K DuBaere	8/3/2022	8/3/2022	2:45	122080433.01	Influent (Grab)	6'oC	8/3/2022	8:05	TSS	87.0	mg/l	8/5/2022	12:00	SM 2540D	SUB8
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.01	Influent (Grab)	8' oC	9/7/2022	10:00	BOD	21	mg/l	9/8/2022	18:12	SM 5210B	SUB8
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.01	Influent (Grab)	8' oC	9/7/2022	10:00	pH	7.02	s.u.	9/7/2022	17:00	SM 4500HB	NH
Sep-22	K DuBaere	9/7/2022	9/7/2022	3:00	122090530.01	Influent (Grab)	8' oC	9/7/2022	10:00	TSS	54.0	mg/l	9/17/2022	12:00	SM 2540D	SUB8
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.01	Influent (Grab)	9.5' oC	10/5/2022	12:00	BOD	20	mg/l	10/7/2022	10:30	SM 5210B	SUB8
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.01	Influent (Grab)	9.5' oC	10/5/2022	12:00	pH	7.20	s.u.	10/5/2022	15:55	SM 4500HB	NH
Oct-22	K DuBaere	10/5/2022	10/5/2022	2:00	122100509.01	Influent (Grab)	9.5' oC	10/5/2022	12:00	TSS	52	mg/l	10/10/2022	12:00	SM 2540D	SUB8
Nov-22	K DuBaere	11/2/2022	11/2/2022	1:40	122110202.01	Influent (Grab)	5' oC	11/2/2022	12:30	BOD	17	mg/l	11/3/2022	16:16	SM 5210B	SUB8
Nov-22	K DuBaere	11/2/2022	11/2/2022	1:40	122110202.01	Influent (Grab)	5' oC	11/2/2022	12:30	pH	7.72	s.u.	11/2/2022	16:10	SM 4500HB	NH
Nov-22	K DuBaere	11/2/2022	11/2/2022	1:40	122110202.01	Influent (Grab)	5' oC	11/2/2022	12:30	TSS	23	mg/l	11/7/2022	12:00	SM 2540D	SUB8
Dec-22	K DuBaere	12/7/2022	12/7/2022	2:30	122120674.01	Influent (Grab)	9.9' oC	12/7/2022	8:20	BOD	100	mg/l	12/8/2022	15:20	SM 5210B	SUB8
Dec-22	K DuBaere	12/7/2022	12/7/2022	2:30	122120674.01	Influent (Grab)	9.9' oC	12/7/2022	8:20	pH	7.55	s.u.	12/7/2022	17:36	SM 4500HB	JO
Dec-22	K DuBaere	12/7/2022	12/7/2022	2:30	122120674.01	Influent (Grab)	9.9' oC	12/7/2022	8:20	TSS	77	mg/l	12/12/2022	12:00	SM 2540D	SUB8
Jan-23	K Dubaere	1/5/2023	1/5/2023	12:00	123010152.01	Influent (Grab)	15.2'oC	1/5/2023	7:50	BOD	240	mg/l	1/5/2023	13:55	SM 5210B	SUB8
Jan-23	K Dubaere	1/5/2023	1/5/2023	12:00	123010152.01	Influent (Grab)	15.2'oC	1/5/2023	7:50	pH	7.36	s.u.	1/4/2023	17:00	SM 4500HB	JO
Jan-23	K Dubaere	1/5/2023	1/5/2023	12:00	123010152.01	Influent (Grab)	15.2'oC	1/5/2023	7:50	TSS	76	mg/l	1/6/2023	12:00	SM 2540D	SUB8
Feb-23	K Dubaere	2/1/2023	2/1/2023	1:45	120020377.01	Influent (Grab)	3.0'oC	2/1/2023	11:10	BOD	370	mg/l	2/2/2023	14:25	SM 5210B	SUB8
Feb-23	K Dubaere	2/1/2023	2/1/2023	1:45	120020377.01	Influent (Grab)	3.0'oC	2/1/2023	11:10	pH	7.41	s.u.	2/1/2023	16:25	SM 4500HB	LS
Feb-23	K Dubaere	2/1/2023	2/1/2023	1:45	120020377.01	Influent (Grab)	3.0'oC	2/1/2023	11:10	TSS	67	mg/l	2/3/2023	12:00	SM 2540D	SUB8
Mar-23	K Dubaere	3/8/2023	3/8/2023	2:20	123030726.01	Influent (Grab)	20.8'oC	3/8/2023	10:05	BOD	500	mg/l	3/9/2023	15:12	SM 5210B	SUB8
Mar-23	K Dubaere	3/8/2023	3/8/2023	2:20	123030726.01	Influent (Grab)	20.8'oC	3/8/2023	10:05	pH	7.30	s.u.	3/8/2023	15:55	SM 4500HB	LS
Mar-23	K Dubaere	3/8/2023	3/8/2023	2:20	123030726.01	Influent (Grab)	20.8'oC	3/8/2023	10:05	TSS	110	mg/l	3/10/2023	12:00	SM 2540D	SUB8
Apr-23	K Dubaere	4/5/2023	4/5/2023	2:00	123040425.01	Influent (Grab)	1.7'oC	4/5/2023	7:30	BOD	390	mg/l	4/6/2023	17:10	SM 5210B	SUB8
Apr-23	K Dubaere	4/5/2023	4/5/2023	2:00	123040425.01	Influent (Grab)	1.7'oC	4/5/2023	7:30	pH	7.06	s.u.	4/6/2023	16:31	SM 4500HB	LS
Apr-23	K Dubaere	4/5/2023	4/5/2023	2:00	123040425.01	Influent (Grab)	1.7'oC	4/5/2023	7:30	TSS	370	mg/l	4/10/2023	12:00	SM 2540D	SUB8
May-23	K DuBaere	5/3/2023	5/3/2023	1:55	123050365.01	Influent (Grab)	4.7'oC	5/3/2023	7:55	BOD	40	mg/l	5/4/2023	18:30	SM 5210B	SUB8
May-23	K DuBaere	5/3/2023	5/3/2023	1:55	123050365.01	Influent (Grab)	4.7'oC	5/3/2023	7:55	pH	6.89	s.u.	5/3/2023	15:20	SM 4500HB	LS
May-23	K DuBaere	5/3/2023	5/3/2023	1:55	123050365.01	Influent (Grab)	4.7'oC	5/3/2023	7:55	TSS	32	mg/l	5/5/2023	12:00	SM 2540D	SUB8
May-23	K DuBaere	5/24/2023	5/24/2023	10:25	123052376.01	Effluent (Grab)	15.8'oC	5/24/2023	7:30	TKN	7.46	mg/l	6/6/2023	12:00	E351.1	SUB8
May-23	K DuBaere	5/24/2023	5/24/2023	10:25	123052376.01	Effluent (Grab)	15.8'oC	5/24/2023	7:30	E. Coli	<1	mpn/100mL	5/24/2023	15:00	SM9223B	KLW
May-23	K DuBaere	5/24/2023	5/24/2023	10:25	123052376.01	Effluent (Grab)	15.8'oC	5/24/2023	7:30	BOD	5.8	mg/l	5/25/2023	16:00	SM 5210B	SUB8
May-23	K DuBaere	5/24/2023	5/24/2023	10:25	123052376.01	Effluent (Grab)	15.8'oC	5/24/2023	7:30	Nitrate Nitrogen	1.0	mg/l	5/24/2023	17:00	SM 4500 NO3 D	LS
May-23	K DuBaere	5/24/2023	5/24/2023	10:25	123052376.01	Effluent (Grab)	15.8'oC	5/24/2023	7:30	pH	6.67	SU	5/24/2023	15:05	SM 4500HB	LS
May-23	K DuBaere	5/24/2023	5/24/2023	10:25	123052376.01	Effluent (Grab)	15.8'oC	5/24/2023	7:30	TSS	<5.0	mg/l	5/26/2023	12:00	SM 2540D	SUB8
Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.01	Influent (Grab)	8'oC	6/7/2023	7:50	BOD	110	mg/l	6/8/2023	17:06	SM 5210B	SUB8
Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.01	Influent (Grab)	8'oC	6/7/2023	7:50	pH	6.90	s.u.	6/7/2023	16:27	SM 4500HB	LS
Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.01	Influent (Grab)	8'oC	6/7/2023	7:50	TSS	130	mg/l	6/12/2023	12:00	SM 2540D	SUB8
Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.02	Effluent (Grab)	8'oC	6/7/2023	7:55	TKN	15.5	mg/l	6/20/2023	12:06	E351.1	SUB8
Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.02	Effluent (Grab)	8'oC	6/7/2023	7:55	E. Coli	3	mpn/100mL	6/7/2023	16:30	SM9223B	LS
Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.02	Effluent (Grab)	8'oC	6/7/2023	7:55	BOD	13	mg/l	6/8/2023	17:06	SM 5210B	SUB8
Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.02	Effluent (Grab)	8'oC	6/7/2023	7:55	Nitrate Nitrogen	<1.0	mg/l	6/7/2023	17:09	SM 4500 NO3 D	LS

Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.02	Effluent (Grab)	8'oC	6/7/2023	7:55	pH	7.49	SU	6/7/2023	16:27	SM 4500HB	LS	
Jun-23	K DuBaere	6/7/2023	6/7/2023	3:30	123060791.02	Effluent (Grab)	8'oC	6/7/2023	7:55	TSS	6.9	mg/l	6/12/2023	12:00	SM 2540D	SUB8	

Location	Sample Date	Temp rec'd	Sample Time	Collected By	Date Received	Time	Lab. I.D.	Parameters	Results	Units	Date Analyzed	Time Analyzed	Test Method	Report Limit	Test Analyst	Location	Total Depth Well	Depth to Ground Water	pH	Specific Conductivity	Dissolved Oxygen
MW #3	1/26/2018	5.6oC	14:35	Normandeau	1/26/2018	3:40	118011790.01	Chloride	40	mg/l	1/29/2018	11:46	SM 4500Cl-B		SJB	MW #3	16.95	3.94	5.9	190	
MW #3	1/26/2018	5.6oC	14:35	Normandeau	1/26/2018	3:40	118011790.01	Nitrate Nitrogen	<1.0	mg/l	1/29/2018	8:32	SM 4500 NO3 D		SJB	MW #3	16.95	3.94	5.9	190	
MW #3	1/26/2018	5.6oC	14:35	Normandeau	1/26/2018	3:40	118011790.01	TKN	2.2	mg/l	2/9/2018	17:00	SM 4500 NH3D		SUB2	MW #3	16.95	3.94	5.9	190	
MW # 4	1/26/2018	5.6oC	14:35	Normandeau	1/26/2018	3:40	118011790.02	Chloride	<6	mg/l	1/29/2018	11:46	SM 4500Cl-B		SJB	MW # 4	46.35	14.99	7.5	120	
MW # 4	1/26/2018	5.6oC	14:35	Normandeau	1/26/2018	3:40	118011790.02	Nitrate Nitrogen	<1.0	mg/l	1/29/2018	8:32	SM 4500 NO3 D		SJB	MW # 4	46.35	14.99	7.5	120	
MW # 4	1/26/2018	5.6oC	14:35	Normandeau	1/26/2018	3:40	118011790.02	TKN	0.65	mg/l	2/9/2018	17:00	SM 4500 NH3D		SUB2	MW # 4	46.35	14.99	7.5	120	
MW # 1	5/8/2018	7 oC	14:55	Ferrisi	5/8/2018	4:20	118050980.01	Chloride	<6	mg/l	5/10/2018	12:37	SM 4500Cl-B		AJN	MW # 1	21.1	1.85	6.9	70	
MW # 1	5/8/2018	7 oC	14:55	Ferrisi	5/8/2018	4:20	118050980.01	E. coli	<1	mpn/100 mL	5/8/2018	16:55	SM 9223B		SJB	MW # 1	21.1	1.85	6.9	70	
MW # 1	5/8/2018	7 oC	14:55	Ferrisi	5/8/2018	4:20	118050980.01	Nitrate Nitrogen	<1.0	mg/l	5/9/2018	16:40	SM 4500 NO3 D		RT	MW # 1	21.1	1.85	6.9	70	
MW # 1	5/8/2018	7 oC	14:55	Ferrisi	5/8/2018	4:20	118050980.01	TKN	<0.25	mg/l	5/17/2018	11:13	EPA 351.2		SUB	MW # 1	21.1	1.85	6.9	70	
MW # 2	5/8/2018	7 oC	14:43	Ferrisi	5/8/2018	4:20	118050980.02	Chloride	12	mg/l	5/10/2018	12:37	SM 4500Cl-B		AJN	MW # 2	21.1	3.8	7.2	190	
MW # 2	5/8/2018	7 oC	14:43	Ferrisi	5/8/2018	4:20	118050980.02	E. coli	<1	mpn/100 mL	5/8/2018	16:55	SM 9223B		SJB	MW # 2	21.1	3.8	7.2	190	
MW # 2	5/8/2018	7 oC	14:43	Ferrisi	5/8/2018	4:20	118050980.02	Nitrate Nitrogen	1.3	mg/l	5/9/2018	16:40	SM 4500 NO3 D		RT	MW # 2	21.1	3.8	7.2	190	
MW # 2	5/8/2018	7 oC	14:43	Ferrisi	5/8/2018	4:20	118050980.02	TKN	0.29	mg/l	5/17/2018	11:15	EPA 351.2		SUB	MW # 2	21.1	3.8	7.2	190	
MW # 3	5/8/2018	7 oC	12:55	Ferrisi	5/8/2018	4:20	118050980.03	Chloride	48	mg/l	5/10/2018	12:37	SM 4500Cl-B		AJN	MW # 3	16.95	3.4	6.5	280	
MW # 3	5/8/2018	7 oC	12:55	Ferrisi	5/8/2018	4:20	118050980.03	E. coli	<1	mpn/100 mL	5/8/2018	16:55	SM 9223B		SJB	MW # 3	16.95	3.4	6.5	280	
MW # 3	5/8/2018	7 oC	12:55	Ferrisi	5/8/2018	4:20	118050980.03	Nitrate Nitrogen	<1.0	mg/l	5/9/2018	16:40	SM 4500 NO3 D		RT	MW # 3	16.95	3.4	6.5	280	
MW # 3	5/8/2018	7 oC	12:55	Ferrisi	5/8/2018	4:20	118050980.03	TKN	<0.25	mg/l	5/17/2018	11:16	EPA 351.2		SUB	MW # 3	16.95	3.4	6.5	280	
MW # 4	5/8/2018	7 oC	13:33	Ferrisi	5/8/2018	4:20	118050980.04	Chloride	<6	mg/l	5/10/2018	12:37	SM 4500Cl-B		AJN	MW # 4	46.35	15.13	7.6	100	
MW # 4	5/8/2018	7 oC	13:33	Ferrisi	5/8/2018	4:20	118050980.04	E. coli	<1	mpn/100 mL	5/8/2018	16:55	SM 9223B		SJB	MW # 4	46.35	15.13	7.6	100	
MW # 4	5/8/2018	7 oC	13:33	Ferrisi	5/8/2018	4:20	118050980.04	Nitrate Nitrogen	<1.0	mg/l	5/9/2018	16:40	SM 4500 NO3 D		RT	MW # 4	46.35	15.13	7.6	100	
MW # 4	5/8/2018	7 oC	13:33	Ferrisi	5/8/2018	4:20	118050980.04	TKN	0.3	mg/l	5/17/2018	11:17	EPA 351.2		SUB	MW # 4	46.35	15.13	7.6	100	
MW # 6	5/8/2018	7 oC	14:04	Ferrisi	5/8/2018	4:20	118050980.05	Chloride	<6	mg/l	5/10/2018	12:37	SM 4500Cl-B		AJN	MW # 6	26.35	12.82	7.4	290	
MW # 6	5/8/2018	7 oC	14:04	Ferrisi	5/8/2018	4:20	118050980.05	E. coli	<1	mpn/100 mL	5/8/2018	16:55	SM 9223B		SJB	MW # 6	26.35	12.82	7.4	290	
MW # 6	5/8/2018	7 oC	14:04	Ferrisi	5/8/2018	4:20	118050980.05	Nitrate Nitrogen	<1.0	mg/l	5/9/2018	16:40	SM 4500 NO3 D		RT	MW # 6	26.35	12.82	7.4	290	
MW # 6	5/8/2018	7 oC	14:04	Ferrisi	5/8/2018	4:20	118050980.05	TKN	<0.25	mg/l	5/17/2018	11:21	EPA 351.2		SUB	MW # 6	26.35	12.82	7.4	290	
MW # 7	5/8/2018	7 oC	14:30	Ferrisi	5/8/2018	4:20	118050980.06	Chloride	<6	mg/l	5/10/2018	12:37	SM 4500Cl-B		AJN	MW # 7	30.5	2	6.4	50	
MW # 7	5/8/2018	7 oC	14:30	Ferrisi	5/8/2018	4:20	118050980.06	E. coli	37	mpn/100 mL	5/8/2018	16:55	SM 9223B		SJB	MW # 7	30.5	2	6.4	50	
MW # 7	5/8/2018	7 oC	14:30	Ferrisi	5/8/2018	4:20	118050980.06	Nitrate Nitrogen	<1.0	mg/l	5/9/2018	16:40	SM 4500 NO3 D		RT	MW # 7	30.5	2	6.4	50	
MW # 7	5/8/2018	7 oC	14:30	Ferrisi	5/8/2018	4:20	118050980.06	TKN	<0.25	mg/l	5/17/2018	11:22	EPA 351.2		SUB	MW # 7	30.5	2	6.4	50	
SW # 1	5/8/2018	7 oC	13:15	Ferrisi	5/8/2018	4:20	118050980.07	Ammonia	<0.5	mg/l	5/11/2018	16:30	SM 4500 NH3D		SUB2	SW # 1	N/A	N/A	7.1	100	
SW # 1	5/8/2018	7 oC	13:15	Ferrisi	5/8/2018	4:20	118050980.07	Chloride	12	mg/l	5/10/2018	12:37	SM 4500Cl-B		AJN	SW # 1	N/A	N/A	7.1	100	
SW # 1	5/8/2018	7 oC	13:15	Ferrisi	5/8/2018	4:20	118050980.07	Nitrate-N	<1.0	mg/l	5/9/2018	16:40	SM 4500 NO3 D		RT	SW # 1	N/A	N/A	7.1	100	
SW # 2	5/8/2018	7 oC	14:10	Ferrisi	5/8/2018	4:20	118050980.08	Ammonia	<0.5	mg/l	5/11/2018	16:30	SM 4500 NH3D		SUB2	SW # 2	N/A	N/A	7.4	110	
SW # 2	5/8/2018	7 oC	14:10	Ferrisi	5/8/2018	4:20	118050980.08	Chloride	16	mg/l	5/10/2018	12:37	SM 4500Cl-B		AJN	SW # 2	N/A	N/A	7.4	110	
SW # 2	5/8/2018	7 oC	14:10	Ferrisi	5/8/2018	4:20	118050980.08	Nitrate-N	<1.0	mg/l	5/9/2018	16:40	SM 4500 NO3 D		RT	SW # 2	N/A	N/A	7.4	110	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfluorooctanesulfonic Acid	<4	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfluoropentanoic Acid	<5	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfluorohexanoic Acid	<5	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfuorooctanoic Acid	<2	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfluorohexanesulfonic Acid	<3	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfluorobutanoic Acid	<5	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfluorobutanesulfonic Acid	<9	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfluoroheptanoic Acid	<2	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 3	6/19/2018	9.3 oC	12:13	Normandeau	6/19/2018	4:00	118062280.01	Perfluorononanoic Acid	<2	ng/L	6/28/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 3	16.95	5.45	6.40	170	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfluorooctanesulfonic Acid	<4	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfluoropentanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfluorohexanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfuorooctanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfluorohexanesulfonic Acid	<3	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfluorobutanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfluorobutanesulfonic Acid	<9	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfluoroheptanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 4	6/19/2018	9.3 oC	12:27	Normandeau	6/19/2018	4:00	118062280.02	Perfluorononanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 4	46.35	15.00	7.69	80	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfluorooctanesulfonic Acid	<4	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfluoropentanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfluorohexanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfuorooctanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfluorohexanesulfonic Acid	<3	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfluorobutanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfluorobutanesulfonic Acid	<9	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfluoroheptanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 6	6/19/2018	9.3 oC	12:50	Normandeau	6/19/2018	4:00	118062280.03	Perfluorononanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 6	26.35	11.63	7.43	290	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfluorooctanesulfonic Acid	<4	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfluoropentanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfluorohexanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfuorooctanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfluorohexanesulfonic Acid	<3	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfluorobutanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfluorobutanesulfonic Acid	<9	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfluoroheptanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 7	6/19/2018	9.3 oC	1:15	Normandeau	6/19/2018	4:00	118062280.04	Perfluorononanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 7	30.50	3.00	7.29	50	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfluorooctanesulfonic Acid	<4	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfluoropentanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfluorohexanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfuorooctanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfluorohexanesulfonic Acid	<3	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfluorobutanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfluorobutanesulfonic Acid	<9	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfluoroheptanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 2	6/19/2018	9.3 oC	1:45	Normandeau	6/19/2018	4:00	118062280.05	Perfluorononanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 2	21.10	3.85	7.42	170	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfluorooctanesulfonic Acid	<4	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfluoropentanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfluorohexanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfuorooctanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfluorohexanesulfonic Acid	<3	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfluorobutanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfluorobutanesulfonic Acid	<9	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfluoroheptanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
MW # 1	6/19/2018	9.3 oC	2:05	Normandeau	6/19/2018	4:00	118062280.06	Perfluorononanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4	MW # 1	21.10	2.30	6.85	60	
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfluorooctanesulfonic Acid	<4	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfluoropentanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfluorohexanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfuorooctanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfluorohexanesulfonic Acid	<3	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfluorobutanoic Acid	<5	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfluorobutanesulfonic Acid	<9	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfluoroheptanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
Field Bank	6/19/2018	9.3 oC	12:10	Normandeau	6/19/2018	4:00	118062280.07	Perfluorononanoic Acid	<2	ng/L	6/29/2018	17:00	EPA 537M PFC Isotope		SUB4						
MW # 1	10/8/2018	4.6 oC	1:55	Ferrisi	10/8/2018	4:10	118100854.01	E. coli	<1	mpn/100 mL	10/8/2018	16:45	SM 9223B	1	AL	MW # 1	21.1	2.6	6.92	60	
MW # 1	10/8/2018	4.6 oC	1:55	Ferrisi	10/8/2018	4:10	118100854.01	TKN	<0.5	mg/l	10/15/2018	15:00	SM 4500 NH3D	0.5	SUB2	MW # 1	21.1	2.6	6.92	60	
MW # 1	10/8/2018	4.6 oC	1:55	Ferrisi	10/8/2018	4:10	118100854.01	Chloride	6	mg/l	10/9/2018	11:40	SM 4500Cl-B	6	CC	MW # 1	21.1	2.6	6.92	60	
MW # 1	10/8/2018	4.6 oC	1:55	Ferrisi	10/8/2018	4:10	118100854.01	Nitrate-N	<1.0	mg/l	10/9/2018	10:44	SM 4500 NO3 D	1	NH	MW # 1	21.1	2.6	6.92	60	

MW # 2	10/8/2018	4.6 oC	1:38	Ferrisi	10/8/2018	4:10	118100854.02	E. coli	<1	mpn/100 mL	10/8/2018	16:45	SM 9223B	1	AL	MW # 2	21.1	3.67	7.33	170
MW # 2	10/8/2018	4.6 oC	1:38	Ferrisi	10/8/2018	4:10	118100854.02	TKN	<0.5	mg/l	10/15/2018	15:00	SM 4500 NH3D	0.5	SUB2	MW # 2	21.1	3.67	7.33	170
MW # 2	10/8/2018	4.6 oC	1:38	Ferrisi	10/8/2018	4:10	118100854.02	Chloride	12	mg/l	10/9/2018	11:40	SM 4500Cl-B	6	CC	MW # 2	21.1	3.67	7.33	170
MW # 2	10/8/2018	4.6 oC	1:38	Ferrisi	10/8/2018	4:10	118100854.02	Nitrate-N	1.3	mg/l	10/9/2018	10:44	SM 4500 NO3 D	1	NH	MW # 2	21.1	3.67	7.33	170
MW # 3	10/8/2018	4.6 oC	12:11	Ferrisi	10/8/2018	4:10	118100854.03	E. coli	<1	mpn/100 mL	10/8/2018	16:45	SM 9223B	1	AL	MW # 3	16.95	4.00	6.05	190
MW # 3	10/8/2018	4.6 oC	12:11	Ferrisi	10/8/2018	4:10	118100854.03	TKN	<0.5	mg/l	10/15/2018	15:00	SM 4500 NH3D	0.5	SUB2	MW # 3	16.95	4.00	6.05	190
MW # 3	10/8/2018	4.6 oC	12:11	Ferrisi	10/8/2018	4:10	118100854.03	Chloride	30	mg/l	10/9/2018	11:40	SM 4500Cl-B	6	CC	MW # 3	16.95	4.00	6.05	190
MW # 3	10/8/2018	4.6 oC	12:11	Ferrisi	10/8/2018	4:10	118100854.03	Nitrate-N	<1.0	mg/l	10/9/2018	10:44	SM 4500 NO3 D	1	NH	MW # 3	16.95	4.00	6.05	190
MW # 4	10/8/2018	4.6 oC	12:32	Ferrisi	10/8/2018	4:10	118100854.04	E. coli	6	mpn/100 mL	10/8/2018	16:45	SM 9223B	1	AL	MW # 4	46.35	16.70	7.64	80
MW # 4	10/8/2018	4.6 oC	12:32	Ferrisi	10/8/2018	4:10	118100854.04	TKN	3.6	mg/l	10/15/2018	15:00	SM 4500 NH3D	0.5	SUB2	MW # 4	46.35	16.70	7.64	80
MW # 4	10/8/2018	4.6 oC	12:32	Ferrisi	10/8/2018	4:10	118100854.04	Chloride	6	mg/l	10/9/2018	11:40	SM 4500Cl-B	6	CC	MW # 4	46.35	16.70	7.64	80
MW # 4	10/8/2018	4.6 oC	12:32	Ferrisi	10/8/2018	4:10	118100854.04	Nitrate-N	<1.0	mg/l	10/9/2018	10:44	SM 4500 NO3 D	1	NH	MW # 4	46.35	16.70	7.64	80
MW # 6	10/8/2018	4.6 oC	12:53	Ferrisi	10/8/2018	4:10	118100854.05	E. coli	50	mpn/100 mL	10/8/2018	16:45	SM 9223B	1	AL	MW # 6	26.35	14.70	7.49	280
MW # 6	10/8/2018	4.6 oC	12:53	Ferrisi	10/8/2018	4:10	118100854.05	TKN	<0.5	mg/l	10/15/2018	15:00	SM 4500 NH3D	0.5	SUB2	MW # 6	26.35	14.70	7.49	280
MW # 6	10/8/2018	4.6 oC	12:53	Ferrisi	10/8/2018	4:10	118100854.05	Chloride	6	mg/l	10/9/2018	11:40	SM 4500Cl-B	6	CC	MW # 6	26.35	14.70	7.49	280
MW # 6	10/8/2018	4.6 oC	12:53	Ferrisi	10/8/2018	4:10	118100854.05	Nitrate-N	<1.0	mg/l	10/9/2018	10:44	SM 4500 NO3 D	1	NH	MW # 6	26.35	14.70	7.49	280
MW # 7	10/8/2018	4.6 oC	1:15	Ferrisi	10/8/2018	4:10	118100854.06	E. coli	6	mpn/100 mL	10/8/2018	16:45	SM 9223B	1	AL	MW # 7	30.50	3.70	6.58	40
MW # 7	10/8/2018	4.6 oC	1:15	Ferrisi	10/8/2018	4:10	118100854.06	TKN	0.8	mg/l	10/15/2018	15:00	SM 4500 NH3D	0.5	SUB2	MW # 7	30.50	3.70	6.58	40
MW # 7	10/8/2018	4.6 oC	1:15	Ferrisi	10/8/2018	4:10	118100854.06	Chloride	6	mg/l	10/9/2018	11:40	SM 4500Cl-B	6	CC	MW # 7	30.50	3.70	6.58	40
MW # 7	10/8/2018	4.6 oC	1:15	Ferrisi	10/8/2018	4:10	118100854.06	Nitrate-N	<1.0	mg/l	10/9/2018	10:44	SM 4500 NO3 D	1	NH	MW # 7	30.50	3.70	6.58	40
SW # 1	10/8/2018	4.6 oC	12:16	Ferrisi	10/8/2018	4:10	118100854.07	Ammonia as N	<0.5	mg/l	10/15/2018	11:30	SM 4500 NH3D	0.5	SUB2	SW # 1	N/A	N/A	6.98	140
SW # 1	10/8/2018	4.6 oC	12:16	Ferrisi	10/8/2018	4:10	118100854.07	Chloride	30	mg/l	10/9/2018	17:25	SM 4500Cl-B	6	CC	SW # 1	N/A	N/A	6.98	140
SW # 1	10/8/2018	4.6 oC	12:16	Ferrisi	10/8/2018	4:10	118100854.07	Nitrate-N	<1.0	mg/l	10/9/2018	10:44	SM 4500 NO3 D	1	NH	SW # 1	N/A	N/A	6.98	140
SW # 2	10/8/2018	4.6 oC	12:58	Ferrisi	10/8/2018	4:10	118100854.08	Ammonia as N	<0.5	mg/l	10/15/2018	11:30	SM 4500 NH3D	0.5	SUB2	SW # 2	N/A	N/A	7.76	150
SW # 2	10/8/2018	4.6 oC	12:58	Ferrisi	10/8/2018	4:10	118100854.08	Chloride	34	mg/l	10/9/2018	17:25	SM 4500Cl-B	6	CC	SW # 2	N/A	N/A	7.76	150
SW # 2	10/8/2018	4.6 oC	12:58	Ferrisi	10/8/2018	4:10	118100854.08	Nitrate-N	<1.0	mg/l	10/9/2018	10:44	SM 4500 NO3 D	1	NH	SW # 2	N/A	N/A	7.76	150
MW #3	1/25/2019	4 oC	11:30	Normandeau	1/25/2019	13:25	119012122.01	Chloride	46	mg/l	1/28/2019	10:20	SM 4500Cl-B	6	NH	MW #3	16.95	3.8	6.33	200
MW #3	1/25/2019	4 oC	11:30	Normandeau	1/25/2019	13:25	119012122.01	Nitrate Nitrogen	<1.0	mg/l	1/25/2019	16:55	SM 4500 NO3 D	1	NH	MW #3	16.95	3.8	6.33	200
MW #3	1/25/2019	4 oC	11:30	Normandeau	1/25/2019	13:25	119012122.01	TKN	0.21	mg/l	2/1/2019	12:00	EPA 351.2	0.10	SUB	MW #3	16.95	3.8	6.33	200
MW # 4	1/25/2019	4 oC	11:55	Normandeau	1/25/2019	13:25	119012122.02	Chloride	6	mg/l	1/28/2019	10:20	SM 4500Cl-B	6	NH	MW # 4	46.35	14.75	7.1	80
MW # 4	1/25/2019	4 oC	11:55	Normandeau	1/25/2019	13:25	119012122.02	Nitrate Nitrogen	<1.0	mg/l	1/25/2019	16:55	SM 4500 NO3 D	1	NH	MW # 4	46.35	14.75	7.1	80
MW # 4	1/25/2019	4 oC	11:55	Normandeau	1/25/2019	13:25	119012122.02	TKN	0.11	mg/l	2/1/2019	12:00	EPA 351.2	0.10	SUB	MW # 4	46.35	14.75	7.1	80
MW # 1	5/8/2019	4.6 oC	1:05	Ferrisi	5/20/2019	16:00	119050968.01	Chloride	6	mg/l	5/9/2019	10:15	SM 4500Cl-B	6	NH	MW # 1	21.10	1.85	6.53	60
MW # 1	5/8/2019	4.6 oC	1:05	Ferrisi	5/20/2019	16:00	119050968.01	E. coli	<1	mpn/100 mL	5/8/2019	15:40	SM 9223B	1	KLW	MW # 1	21.10	1.85	6.53	60
MW # 1	5/8/2019	4.6 oC	1:05	Ferrisi	5/20/2019	16:00	119050968.01	Nitrate Nitrogen	<1.0	mg/l	5/9/2019	14:30	SM 4500 NO3 D	1	NH	MW # 1	21.10	1.85	6.53	60
MW # 1	5/8/2019	4.6 oC	1:05	Ferrisi	5/20/2019	16:00	119050968.01	TKN	<0.10	mg/l	5/11/2019	12:00	EPA 351.1	0.10	SUB	MW # 1	21.10	1.85	6.53	60
MW # 2	5/8/2019	4.6 oC	12:40	Ferrisi	5/20/2019	16:00	119050968.02	Chloride	20	mg/l	5/9/2019	10:15	SM 4500Cl-B	6	NH	MW # 2	21.10	3.70	7.06	160
MW # 2	5/8/2019	4.6 oC	12:40	Ferrisi	5/20/2019	16:00	119050968.02	E. coli	<1	mpn/100 mL	5/8/2019	15:40	SM 9223B	1	KLW	MW # 2	21.10	3.70	7.06	160
MW # 2	5/8/2019	4.6 oC	12:40	Ferrisi	5/20/2019	16:00	119050968.02	Nitrate Nitrogen	<1.0	mg/l	5/9/2019	14:30	SM 4500 NO3 D	1	NH	MW # 2	21.10	3.70	7.06	160
MW # 2	5/8/2019	4.6 oC	12:40	Ferrisi	5/20/2019	16:00	119050968.02	TKN	0.22	mg/l	5/11/2019	12:00	EPA 351.1	0.10	SUB	MW # 2	21.10	3.70	7.06	160
MW # 3	5/8/2019	4.6 oC	11:00	Ferrisi	5/20/2019	16:00	119050968.03	Chloride	68	mg/l	5/9/2019	10:15	SM 4500Cl-B	6	NH	MW # 3	16.95	3.50	6.31	280
MW # 3	5/8/2019	4.6 oC	11:00	Ferrisi	5/20/2019	16:00	119050968.03	E. coli	<1	mpn/100 mL	5/8/2019	15:40	SM 9223B	1	KLW	MW # 3	16.95	3.50	6.31	280
MW # 3	5/8/2019	4.6 oC	11:00	Ferrisi	5/20/2019	16:00	119050968.03	Nitrate Nitrogen	<1.0	mg/l	5/9/2019	14:30	SM 4500 NO3 D	1	NH	MW # 3	16.95	3.50	6.31	280
MW # 3	5/8/2019	4.6 oC	11:00	Ferrisi	5/20/2019	16:00	119050968.03	TKN	<0.10	mg/l	5/11/2019	12:00	EPA 351.1	0.1	SUB	MW # 3	16.95	3.50	6.31	280
MW # 4	5/8/2019	4.6 oC	11:30	Ferrisi	5/20/2019	16:00	119050968.04	Chloride	<6	mg/l	5/9/2019	10:15	SM 4500Cl-B	6	NH	MW # 4	46.35	14.30	7.20	80
MW # 4	5/8/2019	4.6 oC	11:30	Ferrisi	5/20/2019	16:00	119050968.04	E. coli	<1	mpn/100 mL	5/8/2019	15:40	SM 9223B	1	KLW	MW # 4	46.35	14.30	7.20	80
MW # 4	5/8/2019	4.6 oC	11:30	Ferrisi	5/20/2019	16:00	119050968.04	Nitrate Nitrogen	<1.0	mg/l	5/9/2019	14:30	SM 4500 NO3 D	1	NH	MW # 4	46.35	14.30	7.20	80
MW # 4	5/8/2019	4.6 oC	11:30	Ferrisi	5/20/2019	16:00	119050968.04	TKN	0.2	mg/l	5/11/2019	12:00	EPA 351.1	0.1	SUB	MW # 4	46.35	14.30	7.20	80
MW # 6	5/8/2019	4.6 oC	11:51	Ferrisi	5/20/2019	16:00	119050968.05	Chloride	<6	mg/l	5/9/2019	10:15	SM 4500Cl-B	6	NH	MW # 6	26.35	10.75	6.96	310
MW # 6	5/8/2019	4.6 oC	11:51	Ferrisi	5/20/2019	16:00	119050968.05	E. coli	<1	mpn/100 mL	5/8/2019	15:40	SM 9223B	1	KLW	MW # 6	26.35	10.75	6.96	310
MW # 6	5/8/2019	4.6 oC	11:51	Ferrisi	5/20/2019	16:00	119050968.05	Nitrate Nitrogen	<1.0	mg/l	5/9/2019	14:30	SM 4500 NO3 D	1	NH	MW # 6	26.35	10.75	6.96	310
MW # 6	5/8/2019	4.6 oC	11:51	Ferrisi	5/20/2019	16:00	119050968.05	TKN	0.14	mg/l	5/11/2019	12:00	EPA 351.1	0.10	SUB	MW # 6	26.35	10.75	6.96	310
MW # 7	5/8/2019	4.6 oC	12:30	Ferrisi	5/20/2019	16:00	119050968.06	Chloride	<6	mg/l	5/9/2019	10:15	SM 4500Cl-B	6	NH	MW # 7	30.50	2.00	6.30	40
MW # 7	5/8/2019	4.6 oC	12:30	Ferrisi	5/20/2019	16:00	119050968.06	E. coli	<1	mpn/100 mL	5/8/2019	15:40	SM 9223B	1	KLW	MW # 7	30.50	2.00	6.30	40
MW # 7	5/8/2019	4.6 oC	12:30	Ferrisi	5/20/2019	16:00	119050968.06	Nitrate Nitrogen	<1.0	mg/l	5/9/2019	14:30	SM 4500 NO3 D	1	NH	MW # 7	30.50	2.00	6.30	40
MW # 7	5/8/2019	4.6 oC	12:30	Ferrisi	5/20/2019	16:00	119050968.06	TKN	<0.10	mg/l	5/11/2019	12:00	EPA 351.1	0.10	SUB	MW # 7	30.50	2.00	6.30	40
SW # 1	5/8/2019	4.6 oC	11:10	Ferrisi	5/20/2019	16:00	119050968.07	Ammonia	<0.5	mg/l	5/13/2019	12:00	SM 4500 NH3D	0.5	SUB2	SW # 1	N/A	N/A	6.84	60
SW # 1	5/8/2019	4.6 oC	11:10	Ferrisi	5/20/2019	16:00	119050968.07	Chloride	14	mg/l	5/9/2019	10:15	SM 4500Cl-B	6	NH	SW # 1	N/A	N/A	6.84	60
SW # 1	5/8/2019	4.6 oC	11:10	Ferrisi	5/20/2019	16:00	119050968.07	Nitrate-N	<1.0	mg/l	5/9/2019	14:30	SM 4500 NO3 D	<1.0	NH	SW # 1	N/A	N/A	6.84	60
SW # 2	5/8/2019	4.6 oC	11:55	Ferrisi	5/20/2019	16:00	119050968.08	Ammonia	<0.5	mg/l	5/13/2019	12:00	SM 4500 NH3D	0.5	SUB2	SW # 2	N/A	N/A	7.04	70
SW # 2	5/8/2019	4.6 oC	11:55	Ferrisi	5/20/2019	16:00	119050968.08	Chloride	14	mg/l	5/9/2019	10:15	SM 4500Cl-B	6	NH	SW # 2	N/A	N/A	7.04	70
SW # 2	5/8/2019	4.6 oC	11:55	Ferrisi	5/20/2019	16:00	119050968.08	Nitrate-N	<1.0	mg/l	5/9/2019	14:30	SM 4500 NO3 D	<1.0	NH	SW # 2	N/A	N/A	7.04	70
MW # 1	10/10/2019	1.4 oC	2:40	Ferrisi	10/24/2019	11:29	119101432.01	Chloride	<6	mg/l	10/11/2019	9:55	SM 4500Cl-B	6	NH					
MW # 1	10/10/2019	1.4 oC	2:40	Ferrisi	10/24/2019	11:29	119101432.01	E. coli	<1	mpn/100 mL	10/10/2019	16:40	SM 9223B	1	AL					
MW # 1	10/10/2019	1.4 oC	2:40	Ferrisi	10/24/2019	11:29	119101432.01	Nitrate Nitrogen	<1.0	mg/l	10/10/2019	16:53	SM 4500 NO3 D	1	NH					
MW # 1	10/10/2019	1.4 oC	2:40	Ferrisi	10/24/2019	11:29	119101432.01	TKN	0.12	mg/l	10/22/2019	17:00	EPA 351.1	0.10	SUB8					
MW # 2	10/10/2019	1.4 oC	2:30	Ferrisi	10/24/2019	11:29	119101432.02	Chloride	12	mg/l	10/11/2019	9:55	SM 4500Cl-B	6	NH					
MW # 2	10/10/2019	1.4 oC	2:30	Ferrisi	10/24/2019	11:29	119101432.02	E. coli	<1	mpn/100 mL	10/10/2019	16:40	SM 9223B	1	AL					
MW # 2	10/10/2019	1.4 oC	2:30	Ferrisi	10/24/2019	11:29	119101432.02	Nitrate Nitrogen	1.6	mg/l	10/10/2019	16:53	SM 4500 NO3 D	1	NH					
MW # 2	10/10/2019	1.4 oC	2:30	Ferrisi	10/24/2019	11:29	119101432.02	TKN	0.22	mg/l	10/22/2019	17:00	EPA 351.1	0.1	SUB8					
MW # 3	10/10/2019	1.4 oC	12:40	Ferrisi	10/24/2019	11:29	119101432.03	Chloride	54	mg/l	10/11/2019	9:55	SM 4500Cl-B	6	NH					
MW # 3	10/10/2019	1.4 oC	12:40	Ferrisi	10/24/2019	11:29	119101432.03	E. coli	<1	mpn/100 mL	10/10/2019	16:40	SM 9223B	1	AL					
MW # 3	10/10/2019	1.4 oC	12:40	Ferrisi	10/24/2019	11:29	119101432.03	Nitrate Nitrogen	<1.0	mg/l	10/10/2019	16:53	SM 4500 NO3 D	1	NH					
MW # 3	10/10/2019	1.4 oC	12:40	Ferrisi	10/24/2019	11:29	119101432.03	TKN	0.49	mg/l	10/22/2019	17:00	EPA 351.1	0.2	SUB8					
MW # 4	10/10/2019	1.4 oC	1:10	Ferrisi	10/24/2019	11:29	119101432.04	Chloride	<6	mg/l	10/11/2019	9:55	SM 4500Cl-B	6	NH					
MW # 4	10/10/2019	1.4 oC	1:10	Ferrisi	10/24/2019	11:29	119101432.04	E. coli	5	mpn/100 mL	10/10/2019	16:40	SM 9223B	1	AL					
MW # 4	10/10/2019	1.4 oC	1:10	Ferrisi	10/24/2019	11:29	119101432.04	Nitrate Nitrogen	<1.0	mg/l	10/10/2019	16:53	SM 4500 NO3 D	1	NH					
MW # 4	10/10/2019	1.4 oC	1:10	Ferrisi	10/24/2019	11:29	119101432.04	TKN	0.33	mg/l	10/22/2019	17:00	EPA 351.1	0.1	SUB8					
MW # 6	10/10/2019	1.4 oC	1:30	Ferrisi	10/24/2019	11:29	119101432.05	Chloride	<6	mg/l	10/11/2019	9:55	SM 4500Cl-B	6	NH					
MW # 6	10/10/2019	1.4 oC	1:30	Ferrisi	10/24/2019	11:29	119101432.05	E. coli	<1	mpn/100 mL	10/10/2019	16:40	SM 9223B	1	AL					
MW # 6	10/10/2019	1.4 oC	1:30	Ferrisi	10/24/2019	11:29	119101432.05	Nitrate Nitrogen	<1.0	mg/l	10/10/2019	16:53	SM 4500 NO3 D	1	NH					
MW # 6	10/10/2019	1.4 oC	1:30	Ferrisi	10/24/2019	11:29	119101432.05	TKN	0.13	mg/l	10/22/2019	17:00	EPA 351.1	0.1	SUB8					
MW # 7	10/10/2019	1.4 oC	2:05	Ferrisi	10/24/2019	11:29	119101432.06	Chloride	<6	mg/l	10/11/2019	9:55	SM 4500Cl-B	6	NH					
MW # 7	10/10/2019	1.4 oC	2:05	Ferrisi	10/24/2019	11:29	119101432.06	E. coli	<1	mpn/100 mL	10/10/2019	16:40	SM 9223B	1	AL					
MW # 7	10/10/2019	1.4 oC	2:05	Ferrisi	10/24/2019	11:29	119101432.06	Nitrate Nitrogen	<1.0	mg/l	10/10/2019	16:53	SM 4500 NO3 D	1	NH					
MW # 7	10/10/2019	1.4 oC	2:05	Ferrisi	10/24/2019	11:29	119101432.06	TKN	0.22	mg/l	10/22/2019	17:00	EPA 351.1	0.1	SUB8					
SW # 1	10/10/2019	1.4 oC	12:50	Ferrisi	10/24/2019	11:29	119101432.07	Ammonia	<0.5	mg/l	10/19/2019	8:30	SM 4500 NH3D	0.5	SUB2					
SW # 1	10/10/2019	1.4 oC	12:50	Ferrisi	10/24/2019	11:29	119101432.07	Chloride	54	mg/l	10/11/2019	9:55	SM 4500Cl-B	6	NH					
SW # 1	10/10/2019	1.4 oC	12:50	Ferrisi	10/24/2019	11:29	119101432.07	Nitrate-N	<1.0	mg/l	10/10/2019	16:53	SM 4500 NO3 D	1	NH					
SW # 2	10/10/2019	1.4 oC	1:42	Ferrisi	10/24/2019	11:29	119101432.08	Ammonia	<0.5	mg/l	10/19/2019	8:30	SM 4500 NH3D	0.5	SUB2					
SW # 2	10/10/2019	1.4 oC	1:42	Ferrisi	10/24/2019	11:29	119101432.08	Chloride	58	mg/l	10/11/2019	9:55	SM 4500Cl-B	6	NH					
SW # 2	**10/10/2019**	**1.4 oC**	**1:42**	**Ferrisi**	**10/24/2019**	**11:29**	**119101432.08**	**Nitrate-N**	**<1.0**	**mg/l**	**10/10/2019**	**16:53**	**SM 4500 NO3 D**	**1**	**NH**					
MW # 1	5/19/2020	2.1 oC	14:45	JD/GW	5/19/2020	16:30	120051723.01	1,4 Dioxane	<0.20	ug/L	5/20/2020	17:03	8260B(SIM)	0.20	RC	MW # 1	21.10	1.82	6.89	0.2
MW # 1	5/19/2020	2.1 oC	14:45	JD/GW	5/19/2020	16:30	120051723.01	Chloride	<6	mg/L	5/20/2020	11:15	SM 4500Cl-B	6	GP	MW # 1	21.10	1.82	6.89	0.2
MW # 1	5/19/2020	2.1 oC	14:45	JD/GW	5/19/2020	16:30	120051723.01	E. coli	<1	mpn/100 mL	5/19/2020	16:45	SM 9223B	1	NH	MW # 1	21.10	1.82	6.89	0.2
MW # 1	5/19/2020	2.1 oC	14:45	JD/GW	5/19/2020	16:30	120051723.01	Nitrate Nitrogen	<1.0	mg/L	5/20/2020	16:40	SM 4500 NO3 D	1	GP	MW # 1	21.10	1.82	6.89	0.2
MW # 1	5/19/2020	2.1 oC	14:45	JD/GW	5/19/2020	16:30	120051723.01	TKN	0.15	mg/L	5/27/2020	17:00	EPA 351.1	0.1	SUB8	MW # 1	21.10	1.82	6.89	0.2
MW # 2	5/19/2020	2.1 oC	15:00	JD/GW	5/19/2020	16:30	120051723.02	1,4 Dioxane	<0.20	ug/L	5/20/2020	17:30	8260B(SIM)	0.20	RC	MW # 2	21.10	3.75	6.50	0.1
MW # 2	5/19/2020	2.1 oC	15:00	JD/GW	5/19/2020	16:30	120051723.02	Chloride	16	mg/L	5/20/2020	11:15	SM 4500Cl-B	6	GP	MW # 2	21.10	3.75	6.50	0.1
MW # 2	5/19/2020	2.1 oC	15:00	JD/GW	5/19/2020	16:30	120051723.02	E. coli	<1	mpn/100 mL	5/19/2020	16:45	SM 9223B	1	NH	MW # 2	21.10	3.75	6.50	0.1
MW # 2	5/19/2020	2.1 oC	15:00	JD/GW	5/19/2020	16:30	120051723.02	Nitrate Nitrogen	1.4	mg/L	5/20/2020	16:40	SM 4500 NO3 D	1	GP	MW # 2	21.10	3.75	6.50	0.1
MW # 2	5/19/2020	2.1 oC	15:00	JD/GW	5/19/2020	16:30	120051723.02	TKN	0.22	mg/L	5/27/2020	17:00	EPA 351.1	0.1	SUB8	MW # 2	21.10	3.75	6.50	0.1
MW # 3	5/19/2020	2.1 oC	12:45	JD/GW	5/19/2020	16:30	120051723.03	1,4 Dioxane	<0.20	ug/L	5/20/2020	17:57	8260B(SIM)	0.20	RC	MW # 3	16.95	3.55	6.09	0.3
MW # 3	5/19/2020	2.1 oC	12:45	JD/GW	5/19/2020	16:30	120051723.03	Chloride	52	mg/L	5/20/2020	11:15	SM 4500Cl-B	6	GP	MW # 3	16.95	3.55	6.09	0.3

MW # 3	5/19/2020	2.1 oC	12:45	JD/GW	5/19/2020	16:30	120051723.03	E. coli	<1	mpn/100 mL	5/19/2020	16:45	SM 9223B	1	NH	MW # 3	16.95	3.55	6.09	0.3
MW # 3	5/19/2020	2.1 oC	12:45	JD/GW	5/19/2020	16:30	120051723.03	Nitrate Nitrogen	<1.0	mg/L	5/20/2020	16:40	SM 4500 NO3 D	1	GP	MW # 3	16.95	3.55	6.09	0.3
MW # 3	5/19/2020	2.1 oC	12:45	JD/GW	5/19/2020	16:30	120051723.03	TKN	0.20	mg/L	5/27/2020	17:00	EPA 351.1	0.1	SUB8	MW # 3	16.95	3.55	6.09	0.3
MW # 4	5/19/2020	2.1 oC	13:30	JD/GW	5/19/2020	16:30	120051723.04	1,4 Dioxane	<0.20	ug/L	5/20/2020	18:24	8260B(SIM)	0.20	RC					
MW # 4	5/19/2020	2.1 oC	13:30	JD/GW	5/19/2020	16:30	120051723.04	Chloride	14	mg/L	5/20/2020	11:15	SM 4500Cl-B	6	GP	MW # 4	46.35	14.24	7.24	0.1
MW # 4	5/19/2020	2.1 oC	13:30	JD/GW	5/19/2020	16:30	120051723.04	E. coli	1	mpn/100 mL	5/19/2020	16:45	SM 9223B	1	NH	MW # 4	46.35	14.24	7.24	0.1
MW # 4	5/19/2020	2.1 oC	13:30	JD/GW	5/19/2020	16:30	120051723.04	Nitrate Nitrogen	<1.0	mg/L	5/20/2020	16:40	SM 4500 NO3 D	1	GP	MW # 4	46.35	14.24	7.24	0.1
MW # 4	5/19/2020	2.1 oC	13:30	JD/GW	5/19/2020	16:30	120051723.04	TKN	0.35	mg/L	5/27/2020	17:00	EPA 351.1	0.1	SUB8	MW # 4	46.35	14.24	7.24	0.1
MW # 6	5/19/2020	2.1 oC	13:50	JD/GW	5/19/2020	16:30	120051723.05	Chloride	<6	mg/L	5/20/2020	11:15	SM 4500Cl-B	6	GP	MW # 4	46.35	14.24	7.24	0.1
MW # 6	5/19/2020	2.1 oC	13:50	JD/GW	5/19/2020	16:30	120051723.05	E. coli	<1	mpn/100 mL	5/19/2020	16:45	SM 9223B	1	NH					
MW # 6	5/19/2020	2.1 oC	13:50	JD/GW	5/19/2020	16:30	120051723.05	Nitrate Nitrogen	<1.0	mg/L	5/20/2020	16:40	SM 4500 NO3 D	1	GP	MW # 6	26.35	10.9	7.11	0.4
MW # 6	5/19/2020	2.1 oC	13:50	JD/GW	5/19/2020	16:30	120051723.05	TKN	0.20	mg/L	5/27/2020	17:00	EPA 351.1	0.1	SUB8	MW # 6	26.35	10.9	7.11	0.4
MW # 7	5/19/2020	2.1 oC	14:15	JD/GW	5/19/2020	16:30	120051723.06	1,4 Dioxane	<0.20	ug/L	5/20/2020	18:52	8260B(SIM)	0.20	RC	MW # 6	26.35	10.9	7.11	0.4
MW # 7	5/19/2020	2.1 oC	14:15	JD/GW	5/19/2020	16:30	120051723.06	Chloride	<6	mg/L	5/20/2020	11:15	SM 4500Cl-B	6	GP	MW # 6	26.35	10.9	7.11	0.4
MW # 7	5/19/2020	2.1 oC	14:15	JD/GW	5/19/2020	16:30	120051723.06	E. coli	2	mpn/100 mL	5/19/2020	16:45	SM 9223B	1	NH	MW # 7	30.50	2.28	5.96	0.1
MW # 7	5/19/2020	2.1 oC	14:15	JD/GW	5/19/2020	16:30	120051723.06	Nitrate Nitrogen	<1.0	mg/L	5/20/2020	16:40	SM 4500 NO3 D	1	GP	MW # 7	30.50	2.28	5.96	0.1
MW # 7	5/19/2020	2.1 oC	14:15	JD/GW	5/19/2020	16:30	120051723.06	TKN	0.25	mg/L	5/27/2020	17:00	EPA 351.1	0.1	SUB8	MW # 7	30.50	2.28	5.96	0.1
SW # 1	5/19/2020	2.1 oC	12:45	JD/GW	5/19/2020	16:30	120051723.07	Ammonia	<0.5	mg/L	5/22/2020	10:30	SM 4500 NH3D	0.5	SUB2	MW # 7	30.50	2.28	5.96	0.1
SW # 1	5/19/2020	2.1 oC	12:45	JD/GW	5/19/2020	16:30	120051723.07	Chloride	16	mg/L	5/20/2020	11:15	SM 4500Cl-B	6	GP	MW # 7	30.50	2.28	5.96	0.1
SW # 1	5/19/2020	2.1 oC	12:45	JD/GW	5/19/2020	16:30	120051723.07	Nitrate-N	<1.0	mg/L	5/20/2020	16:40	SM 4500 NO3 D	1	GP	SW # 1	N/A	N/A	6.70	0.1
SW # 2	5/19/2020	2.1 oC	13:50	JD/GW	5/19/2020	16:30	120051723.08	Ammonia	<0.5	mg/L	5/22/2020	10:30	SM 4500 NH3D	0.5	SUB2	SW # 1	N/A	N/A	6.70	0.1
SW # 2	5/19/2020	2.1 oC	13:50	JD/GW	5/19/2020	16:30	120051723.08	Chloride	16	mg/L	5/20/2020	11:15	SM 4500Cl-B	6	GP	SW # 1	N/A	N/A	6.70	0.1
SW # 2	**5/19/2020**	**2.1 oC**	**13:50**	**JD/GW**	**5/19/2020**	**16:30**	**120051723.08**	**Nitrate-N**	**<1.0**	**mg/L**	**5/20/2020**	**16:40**	**SM 4500 NO3 D**	**1**	**GP**	SW # 2	N/A	N/A	7.34	0.1
MW # 1	10/10/2020	1.4 oC	2:40	Ferrisi	10/24/2020	11:29	119101432.01	Chloride	<6	mg/l	10/11/2020	9:55	SM 4500Cl-B	6	NH	SW # 2	N/A	N/A	7.34	0.1
MW # 1	10/10/2020	1.4 oC	2:40	Ferrisi	10/25/2020	11:29	119101432.01	E. coli	<1	mpn/100 mL	10/10/2020	16:40	SM 9223B	1	AL	SW # 2	N/A	N/A	7.34	0.1
MW # 1	10/10/2020	1.4 oC	2:40	Ferrisi	10/26/2020	11:29	119101432.01	Nitrate Nitrogen	<1.0	mg/l	10/10/2020	16:53	SM 4500 NO3 D	1	NH					
MW # 1	10/10/2020	1.4 oC	2:40	Ferrisi	10/27/2020	11:29	119101432.01	TKN	0.12	mg/l	10/22/2020	17:00	EPA 351.1	0.10	SUB8					
MW # 2	10/10/2020	1.4 oC	2:30	Ferrisi	10/28/2020	11:29	119101432.02	Chloride	12	mg/l	10/11/2020	9:55	SM 4500Cl-B	6	NH					
MW # 2	10/10/2020	1.4 oC	2:30	Ferrisi	10/29/2020	11:29	119101432.02	E. coli	<1	mpn/100 mL	10/10/2020	16:40	SM 9223B	1	AL					
MW # 2	10/10/2020	1.4 oC	2:30	Ferrisi	10/30/2020	11:29	119101432.02	Nitrate Nitrogen	1.6	mg/l	10/10/2020	16:53	SM 4500 NO3 D	1	NH					
MW # 2	10/10/2020	1.4 oC	2:30	Ferrisi	10/31/2020	11:29	119101432.02	TKN	0.22	mg/l	10/22/2020	17:00	EPA 351.1	0.1	SUB8					
MW # 3	10/10/2020	1.4 oC	12:40	Ferrisi	11/1/2020	11:29	119101432.03	Chloride	54	mg/l	10/11/2020	9:55	SM 4500Cl-B	6	NH					
MW # 3	10/10/2020	1.4 oC	12:40	Ferrisi	11/2/2020	11:29	119101432.03	E. coli	<1	mpn/100 mL	10/10/2020	16:40	SM 9223B	1	AL					
MW # 3	10/10/2020	1.4 oC	12:40	Ferrisi	11/3/2020	11:29	119101432.03	Nitrate Nitrogen	<1.0	mg/l	10/10/2020	16:53	SM 4500 NO3 D	1	NH					
MW # 3	10/10/2020	1.4 oC	12:40	Ferrisi	11/4/2020	11:29	119101432.03	TKN	0.49	mg/l	10/22/2020	17:00	EPA 351.1	0.2	SUB8					
MW # 4	10/10/2020	1.4 oC	1:10	Ferrisi	11/5/2020	11:29	119101432.04	Chloride	<6	mg/l	10/11/2020	9:55	SM 4500Cl-B	6	NH					
MW # 4	10/10/2020	1.4 oC	1:10	Ferrisi	11/6/2020	11:29	119101432.04	E. coli	**5**	mpn/100 mL	10/10/2020	16:40	SM 9223B	1	AL					
MW # 4	10/10/2020	1.4 oC	1:10	Ferrisi	11/7/2020	11:29	119101432.04	Nitrate Nitrogen	<1.0	mg/l	10/10/2020	16:53	SM 4500 NO3 D	1	NH					
MW # 4	10/10/2020	1.4 oC	1:10	Ferrisi	11/8/2020	11:29	119101432.04	TKN	0.33	mg/l	10/22/2020	17:00	EPA 351.1	0.1	SUB8					
MW # 6	10/10/2020	1.4 oC	1:30	Ferrisi	11/9/2020	11:29	119101432.05	Chloride	<6	mg/l	10/11/2020	9:55	SM 4500Cl-B	6	NH					
MW # 6	10/10/2020	1.4 oC	1:30	Ferrisi	11/10/2020	11:29	119101432.05	E. coli	<1	mpn/100 mL	10/10/2020	16:40	SM 9223B	1	AL					
MW # 6	10/10/2020	1.4 oC	1:30	Ferrisi	11/11/2020	11:29	119101432.05	Nitrate Nitrogen	<1.0	mg/l	10/10/2020	16:53	SM 4500 NO3 D	1	NH					
MW # 6	10/10/2020	1.4 oC	1:30	Ferrisi	11/12/2020	11:29	119101432.05	TKN	0.13	mg/l	10/22/2020	17:00	EPA 351.1	0.1	SUB8					
MW # 7	10/10/2020	1.4 oC	2:05	Ferrisi	11/13/2020	11:29	119101432.06	Chloride	<6	mg/l	10/11/2020	9:55	SM 4500Cl-B	6	NH					
MW # 7	10/10/2020	1.4 oC	2:05	Ferrisi	11/14/2020	11:29	119101432.06	E. coli	<1	mpn/100 mL	10/10/2020	16:40	SM 9223B	1	AL					
MW # 7	10/10/2020	1.4 oC	2:05	Ferrisi	11/15/2020	11:29	119101432.06	Nitrate Nitrogen	<1.0	mg/l	10/10/2020	16:53	SM 4500 NO3 D	1	NH					
MW # 7	10/10/2020	1.4 oC	2:05	Ferrisi	11/16/2020	11:29	119101432.06	TKN	0.22	mg/l	10/22/2020	17:00	EPA 351.1	0.1	SUB8					
SW # 1	10/10/2020	1.4 oC	12:50	Ferrisi	11/17/2020	11:29	119101432.07	Ammonia	<0.5	mg/l	10/19/2020	8:30	SM 4500 NH3D	0.5	SUB2					
SW # 1	10/10/2020	1.4 oC	12:50	Ferrisi	11/18/2020	11:29	119101432.07	Chloride	54	mg/l	10/11/2020	9:55	SM 4500Cl-B	6	NH					
SW # 1	10/10/2020	1.4 oC	12:50	Ferrisi	11/19/2020	11:29	119101432.07	Nitrate-N	<1.0	mg/l	10/10/2020	16:53	SM 4500 NO3 D	1	NH					
SW # 2	10/10/2020	1.4 oC	1:42	Ferrisi	11/20/2020	11:29	119101432.08	Ammonia	<0.5	mg/l	10/19/2020	8:30	SM 4500 NH3D	0.5	SUB2					
SW # 2	10/10/2020	1.4 oC	1:42	Ferrisi	11/21/2020	11:29	119101432.08	Chloride	58	mg/l	10/11/2020	9:55	SM 4500Cl-B	6	NH					
SW # 2	**10/10/2020**	**1.4 oC**	**1:42**	**Ferrisi**	11/22/2020	**11:29**	**119101432.08**	**Nitrate-N**	**<1.0**	**mg/l**	**10/10/2020**	**16:53**	**SM 4500 NO3 D**	**1**	**NH**					
MW #3	1/20/2021	4.4 oC	10:45	Dugusy	1/20/2021	13:10	121011643.01	Chloride	40	mg/l	1/20/2021	13:55	SM 4500Cl-B	6	GP	MW #3	16.95	3.8	6.33	200
MW #3	1/20/2021	4.4 oC	10:45	Duqusv	1/20/2021	13:10	121011643.01	Nitrate Nitrogen	<1.0	mg/l	1/20/2021	14:00	SM 4500 NO3 D	1	GP	MW #3	16.95	3.8	6.33	200
MW #3	1/20/2021	4.4 oC	10:45	Duqusv	1/20/2021	13:10	121011643.01	TKN	0.77	mg/l	1/26/2021	12:00	EPA 351.1	0.1	SUB8	MW #3	16.95	3.8	6.33	200
MW # 4	1/20/2021	4.4 oC	11:15	Duqusv	1/20/2021	13:10	121011643.02	Chloride	6	mg/l	1/20/2021	13:55	SM 4500Cl-B	6	**GP**	MW # 4	46.35	14.75	7.1	80
MW # 4	1/20/2021	4.4 oC	11:15	Dugusv	1/20/2021	13:10	121011643.02	Nitrate Nitrogen	<1.0	mg/l	1/20/2021	14:00	SM 4500 NO3 D	1	**GP**	MW # 4	46.35	14.75	7.1	80
MW # 4	1/20/2021	4.4 oC	11:15	Dugusv	1/20/2021	13:10	121011643.02	TKN	0.11	mg/l	1/26/2021	12:00	EPA 351.1	0.1	SUB8	MW # 4	46.35	14.75	7.1	80
MW # 1	**5/8/2021**	**4.6 oC**	**1:05**	**Ferrisi**	**5/20/2021**	**16:00**	**119050968.01**	**Chloride**	**6**	**mg/l**	**5/9/2021**	**10:15**	**SM 4500Cl-B**	**6**	**NH**	**MW # 1**	**21.10**	**1.85**	**6.53**	**60**
MW # 1	5/8/2021	4.6 oC	1:05	Ferrisi	5/21/2021	16:00	119050968.01	E. coli	<1	mpn/100 mL	5/8/2021	15:40	SM 9223B	1	KLW	MW # 1	21.10	1.85	6.53	60
MW # 1	5/8/2021	4.6 oC	1:05	Ferrisi	5/22/2021	16:00	119050968.01	Nitrate Nitrogen	<1.0	mg/l	5/9/2021	14:30	SM 4500 NO3 D	1	NH	MW # 1	21.10	1.85	6.53	60
MW # 1	5/8/2021	4.6 oC	1:05	Ferrisi	5/23/2021	16:00	119050968.01	TKN	<0.10	mg/l	5/11/2021	12:00	EPA 351.1	0.10	SUB	MW # 1	21.10	1.85	6.53	60
MW # 2	5/8/2021	4.6 oC	12:40	Ferrisi	5/24/2021	16:00	119050968.02	Chloride	20	mg/l	5/9/2021	10:15	SM 4500Cl-B	6	NH	MW # 2	21.10	3.70	7.06	160
MW # 2	5/8/2021	4.6 oC	12:40	Ferrisi	5/25/2021	16:00	119050968.02	E. coli	<1	mpn/100 mL	5/8/2021	15:40	SM 9223B	1	KLW	MW # 2	21.10	3.70	7.06	160
MW # 2	5/8/2021	4.6 oC	12:40	Ferrisi	5/26/2021	16:00	119050968.02	Nitrate Nitrogen	<1.0	mg/l	5/9/2021	14:30	SM 4500 NO3 D	1	NH	MW # 2	21.10	3.70	7.06	160
MW # 2	5/8/2021	4.6 oC	12:40	Ferrisi	5/27/2021	16:00	119050968.02	TKN	0.22	mg/l	5/11/2021	12:00	EPA 351.1	0.10	SUB	MW # 2	21.10	3.70	7.06	160
MW # 3	5/8/2021	4.6 oC	11:00	Ferrisi	5/28/2021	16:00	119050968.03	Chloride	68	mg/l	5/9/2021	10:15	SM 4500Cl-B	6	NH	MW # 3	16.95	3.50	6.31	280
MW # 3	5/8/2021	4.6 oC	11:00	Ferrisi	5/29/2021	16:00	119050968.03	E. coli	<1	mpn/100 mL	5/8/2021	15:40	SM 9223B	1	KLW	MW # 3	16.95	3.50	6.31	280
MW # 3	5/8/2021	4.6 oC	11:00	Ferrisi	5/30/2021	16:00	119050968.03	Nitrate Nitrogen	<1.0	mg/l	5/9/2021	14:30	SM 4500 NO3 D	1	NH	MW # 3	16.95	3.50	6.31	280
MW # 3	5/8/2021	4.6 oC	11:00	Ferrisi	5/31/2021	16:00	119050968.03	TKN	<0.10	mg/l	5/11/2021	12:00	EPA 351.1	0.1	SUB	MW # 3	16.95	3.50	6.31	280
MW # 4	5/8/2021	4.6 oC	11:30	Ferrisi	6/1/2021	16:00	119050968.04	Chloride	<6	mg/l	5/9/2021	10:15	SM 4500Cl-B	6	NH	MW # 4	46.35	14.30	7.20	80
MW # 4	5/8/2021	4.6 oC	11:30	Ferrisi	6/2/2021	16:00	119050968.04	E. coli	<1	mpn/100 mL	5/8/2021	15:40	SM 9223B	1	KLW	MW # 4	46.35	14.30	7.20	80
MW # 4	5/8/2021	4.6 oC	11:30	Ferrisi	6/3/2021	16:00	119050968.04	Nitrate Nitrogen	<1.0	mg/l	5/9/2021	14:30	SM 4500 NO3 D	1	NH	MW # 4	46.35	14.30	7.20	80
MW # 4	5/8/2021	4.6 oC	11:30	Ferrisi	6/4/2021	16:00	119050968.04	TKN	0.2	mg/l	5/11/2021	12:00	EPA 351.1	0.1	SUB	MW # 4	46.35	14.30	7.20	80
MW # 6	5/8/2021	4.6 oC	11:51	Ferrisi	6/5/2021	16:00	119050968.05	Chloride	<6	mg/l	5/9/2021	10:15	SM 4500Cl-B	6	NH	MW # 6	26.35	10.75	6.96	310
MW # 6	5/8/2021	4.6 oC	11:51	Ferrisi	6/6/2021	16:00	119050968.05	E. coli	<1	mpn/100 mL	5/8/2021	15:40	SM 9223B	1	KLW	MW # 6	26.35	10.75	6.96	310
MW # 6	5/8/2021	4.6 oC	11:51	Ferrisi	6/7/2021	16:00	119050968.05	Nitrate Nitrogen	<1.0	mg/l	5/9/2021	14:30	SM 4500 NO3 D	1	NH	MW # 6	26.35	10.75	6.96	310
MW # 6	5/8/2021	4.6 oC	11:51	Ferrisi	6/8/2021	16:00	119050968.05	TKN	0.14	mg/l	5/11/2021	12:00	EPA 351.1	0.10	SUB	MW # 6	26.35	10.75	6.96	310
MW # 7	5/8/2021	4.6 oC	12:30	Ferrisi	6/9/2021	16:00	119050968.06	Chloride	<6	mg/l	5/9/2021	10:15	SM 4500Cl-B	6	NH	MW # 7	30.50	2.00	6.30	40
MW # 7	5/8/2021	4.6 oC	12:30	Ferrisi	6/10/2021	16:00	119050968.06	E. coli	<1	mpn/100 mL	5/8/2021	15:40	SM 9223B	1	KLW	MW # 7	30.50	2.00	6.30	40
MW # 7	5/8/2021	4.6 oC	12:30	Ferrisi	6/11/2021	16:00	119050968.06	Nitrate Nitrogen	<1.0	mg/l	5/9/2021	14:30	SM 4500 NO3 D	1	NH	MW # 7	30.50	2.00	6.30	40
MW # 7	5/8/2021	4.6 oC	12:30	Ferrisi	6/12/2021	16:00	119050968.06	TKN	<0.10	mg/l	5/11/2021	12:00	EPA 351.1	0.10	SUB	MW # 7	30.50	2.00	6.30	40
SW # 1	5/8/2021	4.6 oC	11:10	Ferrisi	6/13/2021	16:00	119050968.07	Ammonia	<0.5	mg/l	5/13/2021	12:00	SM 4500 NH3D	0.5	SUB2	SW # 1	N/A	N/A	6.84	60
SW # 1	5/8/2021	4.6 oC	11:10	Ferrisi	6/14/2021	16:00	119050968.07	Chloride	14	mg/l	5/9/2021	10:15	SM 4500Cl-B	6	NH	SW # 1	N/A	N/A	6.84	60
SW # 1	5/8/2021	4.6 oC	11:10	Ferrisi	6/15/2021	16:00	119050968.07	Nitrate-N	<1.0	mg/l	5/9/2021	14:30	SM 4500 NO3 D	<1.0	NH	SW # 1	N/A	N/A	6.84	60
SW # 2	5/8/2021	4.6 oC	11:55	Ferrisi	6/16/2021	16:00	119050968.08	Ammonia	<0.5	mg/l	5/13/2021	12:00	SM 4500 NH3D	0.5	SUB2	SW # 2	N/A	N/A	7.04	70
SW # 2	5/8/2021	4.6 oC	11:55	Ferrisi	6/17/2021	16:00	119050968.08	Chloride	14	mg/l	5/9/2021	10:15	SM 4500Cl-B	6	NH	SW # 2	N/A	N/A	7.04	70
SW # 2	5/8/2021	4.6 oC	11:55	Ferrisi	6/18/2021	16:00	119050968.08	Nitrate-N	<1.0	mg/l	5/9/2021	14:30	SM 4500 NO3 D	<1.0	NH	SW # 2	N/A	N/A	7.04	70
MW # 1	10/10/2021	1.4 oC	2:40	Ferrisi	10/24/2021	11:29	119101432.01	Chloride	<6	mg/l	10/11/2021	9:55	SM 4500Cl-B	6	NH					
MW # 1	10/10/2021	1.4 oC	2:40	Ferrisi	10/25/2021	11:29	119101432.01	E. coli	<1	mpn/100 mL	10/10/2021	16:40	SM 9223B	1	AL					
MW # 1	10/10/2021	1.4 oC	2:40	Ferrisi	10/26/2021	11:29	119101432.01	Nitrate Nitrogen	<1.0	mg/l	10/10/2021	16:53	SM 4500 NO3 D	1	NH					
MW # 1	10/10/2021	1.4 oC	2:40	Ferrisi	10/27/2021	11:29	119101432.01	TKN	0.12	mg/l	10/22/2021	17:00	EPA 351.1	0.10	SUB8					
MW # 2	10/10/2021	1.4 oC	2:30	Ferrisi	10/28/2021	11:29	119101432.02	Chloride	12	mg/l	10/11/2021	9:55	SM 4500Cl-B	6	NH					
MW # 2	10/10/2021	1.4 oC	2:30	Ferrisi	10/29/2021	11:29	119101432.02	E. coli	<1	mpn/100 mL	10/10/2021	16:40	SM 9223B	1	AL					
MW # 2	10/10/2021	1.4 oC	2:30	Ferrisi	10/30/2021	11:29	119101432.02	Nitrate Nitrogen	1.6	mg/l	10/10/2021	16:53	SM 4500 NO3 D	1	NH					
MW # 2	10/10/2021	1.4 oC	2:30	Ferrisi	10/31/2021	11:29	119101432.02	TKN	0.22	mg/l	10/22/2021	17:00	EPA 351.1	0.1	SUB8					
MW # 3	10/10/2021	1.4 oC	12:40	Ferrisi	11/1/2021	11:29	119101432.03	Chloride	54	mg/l	10/11/2021	9:55	SM 4500Cl-B	6	NH					
MW # 3	10/10/2021	1.4 oC	12:40	Ferrisi	11/2/2021	11:29	119101432.03	E. coli	<1	mpn/100 mL	10/10/2021	16:40	SM 9223B	1	AL					
MW # 3	10/10/2021	1.4 oC	12:40	Ferrisi	11/3/2021	11:29	119101432.03	Nitrate Nitrogen	<1.0	mg/l	10/10/2021	16:53	SM 4500 NO3 D	1	NH					
MW # 3	10/10/2021	1.4 oC	12:40	Ferrisi	11/4/2021	11:29	119101432.03	TKN	0.49	mg/l	10/22/2021	17:00	EPA 351.1	0.2	SUB8					
MW # 4	10/10/2021	1.4 oC	1:10	Ferrisi	11/5/2021	11:29	119101432.04	Chloride	<6	mg/l	10/11/2021	9:55	SM 4500Cl-B	6	NH					
MW # 4	10/10/2021	1.4 oC	1:10	Ferrisi	11/6/2021	11:29	119101432.04	E. coli	**5**	mpn/100 mL	10/10/2021	16:40	SM 9223B	1	AL					
MW # 4	10/10/2021	1.4 oC	1:10	Ferrisi	11/7/2021	11:29	119101432.04	Nitrate Nitrogen	<1.0	mg/l	10/10/2021	16:53	SM 4500 NO3 D	1	NH					

MW # 4	10/10/2021	1.4 oC	1:10	Ferrisi	11/8/2021	11:29	119101432.04	TKN	0.33	mg/l	10/22/2021	17:00	EPA 351.1	0.1	SUB8							
MW # 6	10/10/2021	1.4 oC	1:30	Ferrisi	11/9/2021	11:29	119101432.05	Chloride	<6	mg/l	10/11/2021	9:55	SM 4500Cl-B	6	NH							
MW # 6	10/10/2021	1.4 oC	1:30	Ferrisi	11/10/2021	11:29	119101432.05	E. coli	<1	mpn/100 mL	10/10/2021	16:40	SM 9223B	1	AL							
MW # 6	10/10/2021	1.4 oC	1:30	Ferrisi	11/11/2021	11:29	119101432.05	Nitrate Nitrogen	<1.0	mg/l	10/10/2021	16:53	SM 4500 NO3 D	1	NH							
MW # 6	10/10/2021	1.4 oC	1:30	Ferrisi	11/12/2021	11:29	119101432.05	TKN	0.13	mg/l	10/22/2021	17:00	EPA 351.1	0.1	SUB8							
MW # 7	10/10/2021	1.4 oC	2:05	Ferrisi	11/13/2021	11:29	119101432.06	Chloride	<6	mg/l	10/11/2021	9:55	SM 4500Cl-B	6	NH							
MW # 7	10/10/2021	1.4 oC	2:05	Ferrisi	11/14/2021	11:29	119101432.06	E. coli	<1	mpn/100 mL	10/10/2021	16:40	SM 9223B	1	AL							
MW # 7	10/10/2021	1.4 oC	2:05	Ferrisi	11/15/2021	11:29	119101432.06	Nitrate Nitrogen	<1.0	mg/l	10/10/2021	16:53	SM 4500 NO3 D	1	NH							
MW # 7	10/10/2021	1.4 oC	2:05	Ferrisi	11/16/2021	11:29	119101432.06	TKN	0.22	mg/l	10/22/2021	17:00	EPA 351.1	0.1	SUB8							
SW # 1	10/10/2021	1.4 oC	12:50	Ferrisi	11/17/2021	11:29	119101432.07	Ammonia	<0.5	mg/l	10/19/2021	8:30	SM 4500 NH3D	0.5	SUB2							
SW # 1	10/10/2021	1.4 oC	12:50	Ferrisi	11/18/2021	11:29	119101432.07	Chloride	54	mg/l	10/11/2021	9:55	SM 4500Cl-B	6	NH							
SW # 1	10/10/2021	1.4 oC	12:50	Ferrisi	11/19/2021	11:29	119101432.07	Nitrate-N	<1.0	mg/l	10/10/2021	16:53	SM 4500 NO3 D	1	NH							
SW # 2	10/10/2021	1.4 oC	1:42	Ferrisi	11/20/2021	11:29	119101432.08	Ammonia	<0.5	mg/l	10/19/2021	8:30	SM 4500 NH3D	0.5	SUB2							
SW # 2	10/10/2021	1.4 oC	1:42	Ferrisi	11/21/2021	11:29	119101432.08	Chloride	58	mg/l	10/11/2021	9:55	SM 4500Cl-B	6	NH							
SW # 2	**10/10/2021**	**1.4 oC**	**1:42**	**Ferrisi**	11/22/2021	**11:29**	**119101432.08**	**Nitrate-N**	**<1.0**	**mg/l**	**10/10/2021**	**16:53**	**SM 4500 NO3 D**	**1**	**NH**							
MW #3	1/5/2022	2.5 oC	10:05	Duguay	1/5/2022	12:30	122013331.01	Chloride	60	mg/l	1/5/2022	15:35	SM 4500Cl-B	6	NH							
MW #3	1/5/2022	2.5 oC	10:05	Duguay	1/5/2022	12:30	122013331.01	Nitrate Nitrogen	<1.0	mg/l	1/5/2022	12:40	SM 4500 NO3 D	1	NH							
MW #3	1/5/2022	2.5 oC	10:05	Duguay	1/5/2022	12:30	122013331.01	TKN	0.62	mg/l	1/13/2022	12:00	EPA 351.1	0.2	SUB8							
MW # 4	1/5/2022	2.5 oC	10:20	Duguay	1/5/2022	12:30	122013331.02	Chloride	<6	mg/l	1/5/2022	15:35	SM 4500Cl-B	6	NH							
MW # 4	1/5/2022	2.5 oC	10:20	Duguay	1/5/2022	12:30	122013331.02	Nitrate Nitrogen	<1.0	mg/l	1/5/2022	12:40	SM 4500 NO3 D	1	NH							
MW # 4	1/5/2022	2.5 oC	10:20	Duguay	1/5/2022	12:30	122013331.02	TKN	<0.10	mg/l	1/13/2022	12:00	EPA 351.1	0.10	SUB8							
MW # 1	5/10/2022	8.8 oC	13:25	Duguay	5/10/2022	15:10	122051001.01	Chloride	6	mg/l	5/10/2022	15:53	SM 4500Cl-B	6	NH							
MW # 1	5/10/2022	8.8 oC	13:25	Duguay	5/10/2022	15:10	122051001.01	E. coli	<1	mpn/100 mL	5/10/2022	16:20	SM 9223B	1	KLW							
MW # 1	5/10/2022	8.8 oC	13:25	Duguay	5/10/2022	15:10	122051001.01	Nitrate Nitrogen	<1.0	mg/l	5/10/2022	16:20	SM 4500 NO3 D	1	NH							
MW # 1	5/10/2022	8.8 oC	13:25	Duguay	5/10/2022	15:10	122051001.01	TKN	<0.10	mg/l	5/19/2022	12:00	EPA 351.1	0.10	SUB8							
MW # 2	5/10/2022	8.8 oC	13:00	Duguay	5/10/2022	15:10	122051001.02	Chloride	30	mg/l	5/10/2022	15:53	SM 4500Cl-B	30	NH							
MW # 2	5/10/2022	8.8 oC	13:00	Duguay	5/10/2022	15:10	122051001.02	E. coli	<1	mpn/100 mL	5/10/2022	16:20	SM 9223B	1	KLW							
MW # 2	5/10/2022	8.8 oC	13:00	Duguay	5/10/2022	15:10	122051001.02	Nitrate Nitrogen	<1.0	mg/l	5/10/2022	16:20	SM 4500 NO3 D	1	NH							
MW # 2	5/10/2022	8.8 oC	13:00	Duguay	5/10/2022	15:10	122051001.02	TKN	0.44	mg/l	5/19/2022	12:00	EPA 351.1	0.20	SUB8							
MW # 3	5/10/2022	8.8 oC	11:05	Duguay	5/10/2022	15:10	122051001.03	Chloride	30	mg/l	5/10/2022	15:53	SM 4500Cl-B	30	NH							
MW # 3	5/10/2022	8.8 oC	11:05	Duguay	5/10/2022	15:10	122051001.03	E. coli	<1	mpn/100 mL	5/10/2022	16:20	SM 9223B	1	KLW							
MW # 3	5/10/2022	8.8 oC	11:05	Duguay	5/10/2022	15:10	122051001.03	Nitrate Nitrogen	<1.0	mg/l	5/10/2022	16:20	SM 4500 NO3 D	1	NH							
MW # 3	5/10/2022	8.8 oC	11:05	Duguay	5/10/2022	15:10	122051001.03	TKN	0.46	mg/l	5/19/2022	12:00	EPA 351.1	0.20	SUB8							
MW # 4	5/10/2022	8.8 oC	11:53	Duguay	5/10/2022	15:10	122051001.04	Chloride	<6	mg/l	5/10/2022	15:53	SM 4500Cl-B	6	NH							
MW # 4	5/10/2022	8.8 oC	11:53	Duguay	5/10/2022	15:10	122051001.04	E. coli	<1	mpn/100 mL	5/10/2022	16:20	SM 9223B	1	KLW							
MW # 4	5/10/2022	8.8 oC	11:53	Duguay	5/10/2022	15:10	122051001.04	Nitrate Nitrogen	<1.0	mg/l	5/10/2022	16:20	SM 4500 NO3 D	1	NH							
MW # 4	5/10/2022	8.8 oC	11:53	Duguay	5/10/2022	15:10	122051001.04	TKN	0.15	mg/l	5/19/2022	12:00	EPA 351.1	0.10	SUB8							
MW # 6	5/10/2022	8.8 oC	12:07	Duguay	5/10/2022	15:10	122051001.05	Chloride	<6	mg/l	5/10/2022	15:53	SM 4500Cl-B	6	NH							
MW # 6	5/10/2022	8.8 oC	12:07	Duguay	5/10/2022	15:10	122051001.05	E. coli	<1	mpn/100 mL	5/10/2022	16:20	SM 9223B	1	KLW							
MW # 6	5/10/2022	8.8 oC	12:07	Duguay	5/10/2022	15:10	122051001.05	Nitrate Nitrogen	<1.0	mg/l	5/10/2022	16:20	SM 4500 NO3 D	1	NH							
MW # 6	5/10/2022	8.8 oC	12:07	Duguay	5/10/2022	15:10	122051001.05	TKN	0.61	mg/l	5/19/2022	12:00	EPA 351.1	0.20	SUB8							
MW # 7	5/10/2022	8.8 oC	12:40	Duguay	5/10/2022	15:10	122051001.06	Chloride	<6	mg/l	5/10/2022	15:53	SM 4500Cl-B	6	NH							
MW # 7	5/10/2022	8.8 oC	12:40	Duguay	5/10/2022	15:10	122051001.06	E. coli	<1	mpn/100 mL	5/10/2022	16:20	SM 9223B	1	KLW							
MW # 7	5/10/2022	8.8 oC	12:40	Duguay	5/10/2022	15:10	122051001.06	Nitrate Nitrogen	<1.0	mg/l	5/10/2022	16:20	SM 4500 NO3 D	1	NH							
MW # 7	5/10/2022	8.8 oC	12:40	Duguay	5/10/2022	15:10	122051001.06	TKN	0.36	mg/l	5/19/2022	12:00	EPA 351.1	0.10	SUB8							
SW # 1	5/10/2022	8.8 oC	11:21	Duguay	5/10/2022	15:10	122051001.07	Ammonia	0.11	mg/l	5/17/2022	12:00	E350.1	0.05	SUB8							
SW # 1	5/10/2022	8.8 oC	11:21	Duguay	5/10/2022	15:10	122051001.07	Chloride	16	mg/l	5/10/2022	15:53	SM 4500Cl-B	6	NH							
SW # 1	5/10/2022	8.8 oC	11:21	Duguay	5/10/2022	15:10	122051001.07	Nitrate-N	<1.0	mg/l	5/10/2022	16:20	SM 4500 NO3 D	1	NH							
SW # 2	5/10/2022	8.8 oC	12:23	Duguay	5/10/2022	15:10	122051001.08	Ammonia	<0.05	mg/l	5/17/2022	12:00	E350.1	0.05	SUB8							
SW # 2	5/10/2022	8.8 oC	12:23	Duguay	5/10/2022	15:10	122051001.08	Chloride	16	mg/l	5/10/2022	15:53	SM 4500Cl-B	6	NH							
SW # 2	5/10/2022	8.8 oC	12:23	Duguay	5/10/2022	15:10	122051001.08	Nitrate-N	<1.0	mg/l	5/10/2022	16:20	SM 4500 NO3 D	1	NH							
MW # 1	10/13/2022	4.4 oC	2:10	Ferrisi	10/13/2022	15:35	122101410.01	Chloride	<6	mg/l	10/13/2022	16:10	SM 4500Cl-B	6	NH	MW # 1	21.10	2.75	6.83	90		
MW # 1	10/13/2022	4.4 oC	2:10	Ferrisi	10/13/2022	15:35	122101410.01	E. coli	<1	mpn/100 mL	10/13/2022	16:00	SM 9223B	1	KF	MW # 1	21.10	2.75	6.83	90		
MW # 1	10/13/2022	4.4 oC	2:10	Ferrisi	10/13/2022	15:35	122101410.01	Nitrate Nitrogen	<1.0	mg/l	10/13/2022	16:50	SM 4500 NO3 D	1	NH	MW # 1	21.10	2.75	6.83	90		
MW # 1	10/13/2022	4.4 oC	2:10	Ferrisi	10/13/2022	15:35	122101410.01	TKN	0.17	mg/l	10/25/2022	12:00	EPA 351.1	0.10	SUB8	MW # 1	21.10	2.75	6.83	90		
MW # 2	10/13/2022	4.4 oC	2:00	Ferrisi	10/13/2022	15:35	122101410.02	Chloride	30	mg/l	10/13/2022	16:10	SM 4500Cl-B	30	NH	MW # 2	21.10	4.13	7.42	240		
MW # 2	10/13/2022	4.4 oC	2:00	Ferrisi	10/13/2022	15:35	122101410.02	E. coli	<1	mpn/100 mL	10/13/2022	16:00	SM 9223B	1	KF	MW # 2	21.10	4.13	7.42	240		
MW # 2	10/13/2022	4.4 oC	2:00	Ferrisi	10/13/2022	15:35	122101410.02	Nitrate Nitrogen	1.3	mg/l	10/13/2022	16:50	SM 4500 NO3 D	1	NH	MW # 2	21.10	4.13	7.42	240		
MW # 2	10/13/2022	4.4 oC	2:00	Ferrisi	10/13/2022	15:35	122101410.02	TKN	0.65	mg/l	10/25/2022	12:00	EPA 351.1	0.2	SUB8	MW # 2	21.10	4.13	7.42	240		
MW # 3	10/13/2022	4.4 oC	12:18	Ferrisi	10/13/2022	15:35	122101410.03	Chloride	60	mg/l	10/13/2022	16:10	SM 4500Cl-B	6	NH	MW # 3	16.95	6.51	6.60	250		
MW # 3	10/13/2022	4.4 oC	12:18	Ferrisi	10/13/2022	15:35	122101410.03	E. coli	2	mpn/100 mL	10/13/2022	16:00	SM 9223B	2	KF	MW # 3	16.95	6.51	6.60	250		
MW # 3	10/13/2022	4.4 oC	12:18	Ferrisi	10/13/2022	15:35	122101410.03	Nitrate Nitrogen	<1.0	mg/l	10/13/2022	16:50	SM 4500 NO3 D	1	NH	MW # 3	16.95	6.51	6.60	250		
MW # 3	10/13/2022	4.4 oC	12:18	Ferrisi	10/13/2022	15:35	122101410.03	TKN	0.79	mg/l	10/25/2022	12:00	EPA 351.1	0.2	SUB8	MW # 3	16.95	6.51	6.60	250		
MW # 4	10/13/2022	4.4 oC	12:46	Ferrisi	10/13/2022	15:35	122101410.04	Chloride	<6	mg/l	10/13/2022	16:10	SM 4500Cl-B	6	NH	MW # 4	46.35	17.14	7.72	120		
MW # 4	10/13/2022	4.4 oC	12:46	Ferrisi	10/13/2022	15:35	122101410.04	E. coli	<1	mpn/100 mL	10/13/2022	16:00	SM 9223B	1	KF	MW # 4	46.35	17.14	7.72	120		
MW # 4	10/13/2022	4.4 oC	12:46	Ferrisi	10/13/2022	15:35	122101410.04	Nitrate Nitrogen	<1.0	mg/l	10/13/2022	16:50	SM 4500 NO3 D	1	NH	MW # 4	46.35	17.14	7.72	120		
MW # 4	10/13/2022	4.4 oC	12:46	Ferrisi	10/13/2022	15:35	122101410.04	TKN	0.20	mg/l	10/25/2022	12:00	EPA 351.1	0.1	SUB8	MW # 4	46.35	17.14	7.72	120		
MW # 6	10/13/2022	4.4 oC	1:04	Ferrisi	10/13/2022	15:35	122101410.05	Chloride	6	mg/l	10/13/2022	16:10	SM 4500Cl-B	6	NH	MW # 6	26.35	14.61	7.43	380		
MW # 6	10/13/2022	4.4 oC	1:04	Ferrisi	10/13/2022	15:35	122101410.05	E. coli	<1	mpn/100 mL	10/13/2022	16:00	SM 9223B	1	KF	MW # 6	26.35	14.61	7.43	380		
MW # 6	10/13/2022	4.4 oC	1:04	Ferrisi	10/13/2022	15:35	122101410.05	Nitrate Nitrogen	<1.0	mg/l	10/13/2022	16:50	SM 4500 NO3 D	1	NH	MW # 6	26.35	14.61	7.43	380		
MW # 6	10/13/2022	4.4 oC	1:04	Ferrisi	10/13/2022	15:35	122101410.05	TKN	0.28	mg/l	10/25/2022	12:00	EPA 351.1	0.1	SUB8	MW # 6	26.35	14.61	7.43	380		
MW # 7	10/13/2022	4.4 oC	1:16	Ferrisi	10/13/2022	15:35	122101410.06	Chloride	6	mg/l	10/13/2022	16:10	SM 4500Cl-B	6	NH	MW # 7	30.50	5.36	6.33	60		
MW # 7	10/13/2022	4.4 oC	1:16	Ferrisi	10/13/2022	15:35	122101410.06	E. coli	2	mpn/100 mL	10/13/2022	16:00	SM 9223B	1	KF	MW # 7	30.50	5.36	6.33	60		
MW # 7	10/13/2022	4.4 oC	1:16	Ferrisi	10/13/2022	15:35	122101410.06	Nitrate Nitrogen	<1.0	mg/l	10/13/2022	16:50	SM 4500 NO3 D	1	NH	MW # 7	30.50	5.36	6.33	60		
MW # 7	10/13/2022	4.4 oC	1:16	Ferrisi	10/13/2022	15:35	122101410.06	TKN	0.30	mg/l	10/25/2022	12:00	EPA 351.1	0.1	SUB8	MW # 7	30.50	5.36	6.33	60		
SW # 1	10/13/2022	4.4 oC	12:35	Ferrisi	10/13/2022	15:35	122101410.07	Ammonia	<0.05	mg/l	10/25/2022	12:00	SM 4500 NH3D	0.05	SUB2	SW # 1	N/A	N/A	7.37	330		
SW # 1	10/13/2022	4.4 oC	12:35	Ferrisi	10/13/2022	15:35	122101410.07	Chloride	54	mg/l	10/13/2022	16:10	SM 4500Cl-B	6	NH	SW # 1	N/A	N/A	7.37	330		
SW # 1	10/13/2022	4.4 oC	12:35	Ferrisi	10/13/2022	15:35	122101410.07	Nitrate-N	<1.0	mg/l	10/13/2022	16:50	SM 4500 NO3 D	1	NH	SW # 1	N/A	N/A	7.37	330		
SW # 2	10/13/2022	4.4 oC	1:44	Ferrisi	10/13/2022	15:35	122101410.08	Ammonia	<0.10	mg/l	10/25/2022	12:00	SM 4500 NH3D	0.1	SUB8	SW # 2	N/A	N/A	7.40	350		
SW # 2	10/13/2022	4.4 oC	1:44	Ferrisi	10/13/2022	15:35	122101410.08	Chloride	60	mg/l	10/13/2022	16:10	SM 4500Cl-B	6	NH	SW # 2	N/A	N/A	7.40	350		
SW # 2	10/13/2022	4.4 oC	1:44	Ferrisi	10/13/2022	15:35	122101410.08	Nitrate-N	<1.0	mg/l	10/13/2022	16:50	SM 4500 NO3 D	1	NH	SW # 2	N/A	N/A	7.40	350		
MW #3	1/24/2023	4 oC	11:45	AB	1/31/2023	15:33	123011934.01	Chloride	34	mg/l	1/24/2023	14:00	SM 4500Cl-B	6	LS	MW #3	16.95	3.83	7.35	240		
MW #3	1/24/2023	4 oC	11:45	AB	1/31/2023	15:33	123011934.01	Nitrate Nitrogen	<1.0	mg/l	1/24/2023	13:55	SM 4500 NO3 D	1	NN	MW #3	16.95	3.83	7.35	240		
MW #3	1/24/2023	4 oC	11:45	AB	1/31/2023	15:33	123011934.01	TKN	0.3	mg/l	1/28/2023	12:00	EPA 351.2	0.20	SUB8	MW #3	16.95	3.83	7.35	240		
MW # 4	1/24/2023	4 oC	11:30	AB	1/31/2023	15:33	123011934.02	Chloride	14	mg/l	1/24/2023	14:00	SM 4500Cl-B	6	LS	MW # 4	46.35	15.50	8.32	100		
MW # 4	1/24/2023	4 oC	11:30	AB	1/31/2023	15:33	123011934.02	Nitrate Nitrogen	<1.0	mg/l	1/24/2023	13:55	SM 4500 NO3 D	1	NN	MW # 4	46.35	15.50	8.32	100		
MW # 4	1/24/2023	4 oC	11:30	AB	1/31/2023	15:33	123011934.02	TKN	<0.10	mg/l	1/28/2023	12:00	EPA 351.2	0.10	SUB8	MW # 4	46.35	15.50	8.32	100		
MW # 1	5/11/2023	3.8 oC	1:30	Emma Baron	5/11/2023	12:02	123051144.01	Chloride	6	mg/l	5/12/2023	9:40	SM 4500Cl-B	6	LS	MW # 1	21.10	1.70	6.95	80		
MW # 1	5/11/2023	3.8 oC	1:30	Emma Baron	5/11/2023	12:02	123051144.01	E. coli	<1	mpn/100 mL	5/11/2023	16:45	SM 9223B	1	ED	MW # 1	21.10	1.70	6.95	80		
MW # 1	5/11/2023	3.8 oC	1:30	Emma Baron	5/11/2023	12:02	123051144.01	Nitrate Nitrogen	<1.0	mg/l	5/11/2023	15:55	SM 4500 NO3 D	1	LS	MW # 1	21.10	1.70	6.95	80		
MW # 1	5/11/2023	3.8 oC	1:30	Emma Baron	5/11/2023	12:02	123051144.01	TKN	0.14	mg/l	5/18/2023	12:00	EPA 351.1	0.10	SUB8	MW # 1	21.10	1.70	6.95	80		
MW # 2	5/11/2023	3.8 oC	1:20	Emma Baron	5/11/2023	12:02	123051144.02	Chloride	80	mg/l	5/12/2023	9:40	SM 4500Cl-B	30	LS	MW # 2	21.10	3.96	7.27	210		
MW # 2	5/11/2023	3.8 oC	1:20	Emma Baron	5/11/2023	12:02	123051144.02	E. coli	<1	mpn/100 mL	5/11/2023	16:45	SM 9223B	1	ED	MW # 2	21.10	3.96	7.27	210		
MW # 2	5/11/2023	3.8 oC	1:20	Emma Baron	5/11/2023	12:02	123051144.02	Nitrate Nitrogen	<1.0	mg/l	5/11/2023	15:55	SM 4500 NO3 D	1	LS	MW # 2	21.10	3.96	7.27	210		
MW # 2	5/11/2023	3.8 oC	1:20	Emma Baron	5/11/2023	12:02	123051144.02	TKN	3.06	mg/l	5/20/2023	12:00	EPA 351.1	0.10	SUB8	MW # 2	21.10	3.96	7.27	210		
MW # 3	5/11/2023	3.8 oC	1:10	Emma Baron	5/11/2023	12:02	123051144.03	Chloride	54	mg/l	5/12/2023	9:40	SM 4500Cl-B	6	LS	MW # 3	16.95	3.21	6.56	280		
MW # 3	5/11/2023	3.8 oC	1:10	Emma Baron	5/11/2023	12:02	123051144.03	E. coli	<1	mpn/100 mL	5/11/2023	16:45	SM 9223B	1	ED	MW # 3	16.95	3.21	6.56	280		
MW # 3	5/11/2023	3.8 oC	1:10	Emma Baron	5/11/2023	12:02	123051144.03	Nitrate Nitrogen	<1.0	mg/l	5/11/2023	15:55	SM 4500 NO3 D	1	LS	MW # 3	16.95	3.21	6.56	280		
MW # 3	5/11/2023	3.8 oC	1:10	Emma Baron	5/11/2023	12:02	123051144.03	TKN	<0.10	mg/l	5/20/2023	12:00	EPA 351.1	0.10	SUB8	MW # 3	16.95	3.21	6.56	280		
MW # 4	5/11/2023	3.8 oC	12:15	Emma Baron	5/11/2023	12:02	123051144.04	Chloride	8	mg/l	5/12/2023	9:40	SM 4500Cl-B	6	LS	MW # 4	46.35	14.25	7.89	100		
MW # 4	5/11/2023	3.8 oC	12:15	Emma Baron	5/11/2023	12:02	123051144.04	E. coli	<1	mpn/100 mL	5/11/2023	16:45	SM 9223B	1	ED	MW # 4	46.35	14.25	7.89	100		
MW # 4	5/11/2023	3.8 oC	12:15	Emma Baron	5/11/2023	12:02	123051144.04	Nitrate Nitrogen	<1.0	mg/l	5/11/2023	15:55	SM 4500 NO3 D	1	LS	MW # 4	46.35	14.25	7.89	100		
MW # 4	5/11/2023	3.8 oC	12:15	Emma Baron	5/11/2023	12:02	123051144.04	TKN	<0.10	mg/l	5/20/2023	12:00	EPA 351.1	0.10	SUB8	MW # 4	46.35	14.25	7.89	100		
MW # 6	5/11/2023	3.8 oC	12:25	Emma Baron	5/11/2023	12:02	123051144.05	Chloride	8	mg/l	5/12/2023	9:40	SM 4500Cl-B	6	LS	MW # 6	26.35	10.69	7.50	350		

MW # 6	5/11/2023	3,8 oC	12:25	Emma Baron	5/11/2023	12:02	123051144,05	E. coli	<1	mpn/100 mL	5/11/2023	16:45	SM 9223B	1	ED	MW # 6	26,35	10,69	7,50	350
MW # 6	5/11/2023	3,8 oC	12:25	Emma Baron	5/11/2023	12:02	123051144,05	Nitrate Nitrogen	<1,0	mg/l	5/11/2023	15:55	SM 4500 NO3 D	1	LS	MW # 6	26,35	10,69	7,50	350
MW # 6	5/11/2023	3,8 oC	12:25	Emma Baron	5/11/2023	12:02	123051144,05	TKN	0,27	mg/l	5/20/2023	12:00	EPA 351,1	0,10	SUB8	MW # 6	26,35	10,69	7,50	350
MW # 7	5/11/2023	3,8 oC	12:45	Emma Baron	5/11/2023	12:02	123051144,06	Chloride	12	mg/l	5/12/2023	9:40	SM 4500Cl-B	6	LS	MW # 7	30,50	2,02	6,50	60
MW # 7	5/11/2023	3,8 oC	12:45	Emma Baron	5/11/2023	12:02	123051144,06	E. coli	<1	mpn/100 mL	5/11/2023	16:45	SM 9223B	1	ED	MW # 7	30,50	2,02	6,50	60
MW # 7	5/11/2023	3,8 oC	12:45	Emma Baron	5/11/2023	12:02	123051144,06	Nitrate Nitrogen	<1,0	mg/l	5/11/2023	15:55	SM 4500 NO3 D	1	LS	MW # 7	30,50	2,02	6,50	60
MW # 7	5/11/2023	3,8 oC	12:45	Emma Baron	5/11/2023	12:02	123051144,06	TKN	0,22	mg/l	5/20/2023	12:00	EPA 351,1	0,10	SUB8	MW # 7	30,50	2,02	6,50	60
SW # 1	5/11/2023	3,8 oC	1:05	Emma Baron	5/11/2023	12:02	123051144,07	Ammonia	<0,05	mg/l	5/18/2023	12:00	E350,1	0,05	SUB8	SW # 1	N/A	N/A	7,04	90
SW # 1	5/11/2023	3,8 oC	1:05	Emma Baron	5/11/2023	12:02	123051144,07	Chloride	20	mg/l	5/12/2023	9:40	SM 4500Cl-B	6	LS	SW # 1	N/A	N/A	7,04	90
SW # 1	5/11/2023	3,8 oC	1:05	Emma Baron	5/11/2023	12:02	123051144,07	Nitrate-N	<1,0	mg/l	5/11/2023	15:55	SM 4500 NO3 D	1	LS	SW # 1	N/A	N/A	7,04	90
SW # 2	5/11/2023	3,8 oC	12:33	Emma Baron	5/11/2023	12:02	123051144,08	Ammonia	0,08	mg/l	5/18/2023	12:00	E350,1	0,05	SUB8	SW # 2	N/A	N/A	7,61	100
SW # 2	5/8/2023	4,6 oC	11:55	Ferrisi	6/17/2023	16:00	119050968,08	Chloride	28	mg/l	5/12/2023	9:40	SM 4500Cl-B	6	LS	SW # 2	N/A	N/A	7,61	100
SW # 2	5/8/2023	4,6 oC	11:55	Ferrisi	6/18/2023	16:00	119050968,08	Nitrate-N	<1,0	mg/l	5/11/2023	16:10	SM 4500 NO3 D	1	LS	SW # 2	N/A	N/A	7,61	100
MW # 1	10/10/2023	1,4 oC	2:40	Ferrisi	10/24/2023	11:29	119101432,01	Chloride	<6	mg/l	10/11/2023	9:55	SM 4500Cl-B	6	NH					
MW # 1	10/10/2023	1,4 oC	2:40	Ferrisi	10/25/2023	11:29	119101432,01	E. coli	<1	mpn/100 mL	10/10/2023	16:40	SM 9223B	1	AL					
MW # 1	10/10/2023	1,4 oC	2:40	Ferrisi	10/26/2023	11:29	119101432,01	Nitrate Nitrogen	<1,0	mg/l	10/10/2023	16:53	SM 4500 NO3 D	1	NH					
MW # 1	10/10/2023	1,4 oC	2:40	Ferrisi	10/27/2023	11:29	119101432,01	TKN	0,12	mg/l	10/22/2023	17:00	EPA 351,1	0,10	SUB8					
MW # 2	10/10/2023	1,4 oC	2:30	Ferrisi	10/28/2023	11:29	119101432,02	Chloride	12	mg/l	10/11/2023	9:55	SM 4500Cl-B	6	NH					
MW # 2	10/10/2023	1,4 oC	2:30	Ferrisi	10/29/2023	11:29	119101432,02	E. coli	<1	mpn/100 mL	10/10/2023	16:40	SM 9223B	1	AL					
MW # 2	10/10/2023	1,4 oC	2:30	Ferrisi	10/30/2023	11:29	119101432,02	Nitrate Nitrogen	1,6	mg/l	10/10/2023	16:53	SM 4500 NO3 D	1	NH					
MW # 2	10/10/2023	1,4 oC	2:30	Ferrisi	10/31/2023	11:29	119101432,02	TKN	0,22	mg/l	10/22/2023	17:00	EPA 351,1	0,1	SUB8					
MW # 3	10/10/2023	1,4 oC	12:40	Ferrisi	11/1/2023	11:29	119101432,03	Chloride	54	mg/l	10/11/2023	9:55	SM 4500Cl-B	6	NH					
MW # 3	10/10/2023	1,4 oC	12:40	Ferrisi	11/2/2023	11:29	119101432,03	E. coli	<1	mpn/100 mL	10/10/2023	16:40	SM 9223B	1	AL					
MW # 3	10/10/2023	1,4 oC	12:40	Ferrisi	11/3/2023	11:29	119101432,03	Nitrate Nitrogen	<1,0	mg/l	10/10/2023	16:53	SM 4500 NO3 D	1	NH					
MW # 3	10/10/2023	1,4 oC	12:40	Ferrisi	11/4/2023	11:29	119101432,03	TKN	0,49	mg/l	10/22/2023	17:00	EPA 351,1	0,2	SUB8					
MW # 4	10/10/2023	1,4 oC	1:10	Ferrisi	11/5/2023	11:29	119101432,04	Chloride	<6	mg/l	10/11/2023	9:55	SM 4500Cl-B	6	NH					
MW # 4	10/10/2023	1,4 oC	1:10	Ferrisi	11/6/2023	11:29	119101432,04	E. coli	5	mpn/100 mL	10/10/2023	16:40	SM 9223B	1	AL					
MW # 4	10/10/2023	1,4 oC	1:10	Ferrisi	11/7/2023	11:29	119101432,04	Nitrate Nitrogen	<1,0	mg/l	10/10/2023	16:53	SM 4500 NO3 D	1	NH					
MW # 4	10/10/2023	1,4 oC	1:10	Ferrisi	11/8/2023	11:29	119101432,04	TKN	0,33	mg/l	10/22/2023	17:00	EPA 351,1	0,1	SUB8					
MW # 6	10/10/2023	1,4 oC	1:30	Ferrisi	11/9/2023	11:29	119101432,05	Chloride	<6	mg/l	10/11/2023	9:55	SM 4500Cl-B	6	NH					
MW # 6	10/10/2023	1,4 oC	1:30	Ferrisi	11/10/2023	11:29	119101432,05	E. coli	<1	mpn/100 mL	10/10/2023	16:40	SM 9223B	1	AL					
MW # 6	10/10/2023	1,4 oC	1:30	Ferrisi	11/11/2023	11:29	119101432,05	Nitrate Nitrogen	<1,0	mg/l	10/10/2023	16:53	SM 4500 NO3 D	1	NH					
MW # 6	10/10/2023	1,4 oC	1:30	Ferrisi	11/12/2023	11:29	119101432,05	TKN	0,13	mg/l	10/22/2023	17:00	EPA 351,1	0,1	SUB8					
MW # 7	10/10/2023	1,4 oC	2:05	Ferrisi	11/13/2023	11:29	119101432,06	Chloride	<6	mg/l	10/11/2023	9:55	SM 4500Cl-B	6	NH					
MW # 7	10/10/2023	1,4 oC	2:05	Ferrisi	11/14/2023	11:29	119101432,06	E. coli	<1	mpn/100 mL	10/10/2023	16:40	SM 9223B	1	AL					
MW # 7	10/10/2023	1,4 oC	2:05	Ferrisi	11/15/2023	11:29	119101432,06	Nitrate Nitrogen	<1,0	mg/l	10/10/2023	16:53	SM 4500 NO3 D	1	NH					
MW # 7	10/10/2023	1,4 oC	2:05	Ferrisi	11/16/2023	11:29	119101432,06	TKN	0,22	mg/l	10/22/2023	17:00	EPA 351,1	0,1	SUB8					
SW # 1	10/10/2023	1,4 oC	12:50	Ferrisi	11/17/2023	11:29	119101432,07	Ammonia	<0,5	mg/l	10/19/2023	8:30	SM 4500 NH3D	0,5	SUB2					
SW # 1	10/10/2023	1,4 oC	12:50	Ferrisi	11/18/2023	11:29	119101432,07	Chloride	54	mg/l	10/11/2023	9:55	SM 4500Cl-B	6	NH					
SW # 1	10/10/2023	1,4 oC	12:50	Ferrisi	11/19/2023	11:29	119101432,07	Nitrate-N	<1,0	mg/l	10/10/2023	16:53	SM 4500 NO3 D	1	NH					
SW # 2	10/10/2023	1,4 oC	1:42	Ferrisi	11/20/2023	11:29	119101432,08	Ammonia	<0,5	mg/l	10/19/2023	8:30	SM 4500 NH3D	0,5	SUB2					
SW # 2	10/10/2023	1,4 oC	1:42	Ferrisi	11/21/2023	11:29	119101432,08	Chloride	58	mg/l	10/11/2023	9:55	SM 4500Cl-B	6	NH					
SW # 2	10/10/2023	1,4 oC	1:42	Ferrisi	11/22/2023	11:29	119101432,08	Nitrate-N	<1,0	mg/l	10/10/2023	16:53	SM 4500 NO3 D	1	NH					

The State of New Hampshire

Department of Environmental Services

Robert R. Scott, Commissioner

June 21, 2023

Re: Wastewater Treatment Plant Operator License Renewal Certification # 1507

Dear: Kris K. Dubaere

Enclosed is your renewal date sticker for your current wastewater treatment plant operator's license. The renewal date sticker should be affixed to the bottom right-hand corner of your official license. Your official license shall be prominently displayed in the office of the wastewater treatment plant at which you are (or will be) employed. **The DES will no longer issue wallet cards**.

Please take a moment to read the enclosed letter regarding Wastewater Treatment Plant Operator Ethics and Responsibility.

As of August 2013, Grade 1 and 1-OIT operators are required to earn 10 hours = 1.0 CEU of training per two-year renewal period. Grade 2, 3 and 4 operators are required to earn 20 hours = 2.0 CEUs of training per two-year renewal period.
Also, if more than the minimum number of CEUs are earned, Grade 1 & 1-OIT certified operators may carry forward a maximum of 5 hours (0.5 CEU) of excess training and apply this into the next renewal period. Grades 2, 3 and 4 may carry forward a maximum of 10 hours (1.0 CEU).

Based on the education credit information submitted with your current renewal form, you have earned **0.5** CEUs of carry over credit that will be applied to your next renewal due date June 30, 2025. Please keep this letter for your records. We appreciate your cooperation.

Sincerely,

Mark A. Kondelis Sr.
Operator Training and Certification
29 Hazen Drive P.O. Box 95
Concord NH 03302-0095
603-271-5553 Mark.A.Kondelis@des.nh.gov

Renewal Date Sticker ↓

June 30, 2025

Enclosure

The State of New Hampshire

Department of Environmental Services
Water Division

BE IT KNOWN THAT

KRIS DUBAERE

having submitted satisfactory evidence of qualifications, knowledge and experience in accordance with the provisions of RSA, 486:9 has been awarded this certificate of competency as a

Wastewater Treatment Facility Operator, Grade 1

Certificate number: 1507

Expiration date:

June 30, 2019

Mary Jane Meier

Chairman

Certification Committee

HOYLE TANNER

Trusted Experts | Innovative Results

July 20, 2023

Ms. Maura Mancini
NE Regional Compliance Manager
Vail Resorts
390 Interlocken Crescent
Broomfield, CO 80021

Re: Review of Mount Sunapee Resort Wastewater Treatment System

Dear Ms. Mancini

Thank you for selecting Hoyle, Tanner & Associates, Inc. (Hoyle Tanner) for your Wastewater Engineering needs. As per our executed agreement dated June 28, 2023, we are pleased to submit this letter report of findings regarding the Mount Sunapee Report Wastewater Treatment System.

Executive Summary

The Mount Sunapee Report Lagoon Facility has been in operation for approximately 50 years since it was constructed in the late 1960's. The spray irrigation system was added in the early 1970's with some piping and irrigation refurbishment completed in approximately the year 2000. Wastewater treatment facilities are typically designed with a 20-year service life.

In general, the Lagoon Facility has performed adequately during the past 5 years of operation. The Resort General Manager and Operator seem conscientious of good facility operation and maintenance to ensure the facility meets permit requirements. Based upon review of the information provided by Mount Sunapee Resort during the Facility Permit renewal application development, site visit, and Operator interview, the Mount Sunapee Resort wastewater treatment system design is operated in a manner to meet expected treatment performance objectives of anticipated flow volumes.

Some of the facility design, however, is outdated. Many facility infrastructure components appear to have exceeded their useful service life. It is recommended that Mount Sunapee Resort commence planning to refurbish the facility to meet more current water treatment system design standards for reliability, redundancy, and operator safety.

Purpose

Engineer conducted a facility visit on June 19, 2023 to interview the operator and observe the facility's physical condition. From this site meeting, along with collection and review of groundwater monitoring well and facility influent/effluent data, we were able to draw some conclusions regarding the condition of the facility's wastewater treatment system.

Background

The lagoon facility has been in operation for approximately 50 years since it was constructed in the late 1960's. The spray irrigation system was added in the early 1970's with some piping and irrigation equipment refurbishment completed in approximately the year 2000. A complete facility basis of design was not available for review prior to the site visit. Facility Construction Record Drawings were not available for review.

Site Visit

Hoyle Tanner Engineer arrived at the Mount Sunapee Resort on June 19, 2023 at approximately 1 PM and interviewed Kris DuBaere, the Wastewater Treatment Facility Certified Operator. Based upon our discussion the following is understood:

1. The Spruce Lodge and Sunapee Lodge septic tanks are typically pumped out twice per year, once in the late Fall, before the higher volume skier visitor period, and once after the winter skier period. All other septic tanks are pumped once per year, except for the Snowmaking Building and Summit Lodge septic tanks, which are pumped every other year. Stearns Septic Service cleans the tanks and hauls the septage to a permitted receiving facility.
2. Building grease traps are installed where food service is provided. The grease traps are maintained at least once per year. The busier lodges are maintained twice per year.
3. No ongoing septic tank operational problems were identified.
4. No ongoing septic tank effluent sewer problems were identified.
5. No problems of the winter shutdown of the spray irrigation system were identified.
6. Normandeau Associates, Inc. reportedly collects the monitoring well samples and Nelson Analytical conducts the laboratory testing.
7. Two new bathrooms, wells, and septic tanks were constructed to service the Maintenance Buildings. These additions have not increased flow to the system as the number of employees has not increased (employees no longer need to go to other buildings on site for sanitary facilities).
8. Mr. DuBaere indicated that the effluent sewers have not been inspected since they were inspected by CCTV in the early 2000's as a preventative measure, however, no significant problems were discovered at that time.
9. Lagoon and spray irrigation operations were discussed with Mr. DuBaere and he offered the following information:
    a. Lagoon water levels are typically highest at this time of year. The lagoon water level appeared (visually) to provide approximately 3' of freeboard at the time of our site visit.
    b. Lagoon freeboard of 3' or more is maintained. Mr. DuBaere indicated that lagoon levels are typically far below the minimum freeboard elevation.
    c. The wastewater system requires very little maintenance as there are no aerators or mixers in the lagoons. The spray fields are mowed 2 to 3 times per spraying season. Vegetation on the lagoon side slopes are cut back every fall by Honduran Forest Management.
    d. The spray irrigation system was not actively discharging during the site visit.

e. The operator typically checks the piezometer levels before and after a spray event and if the levels permit, spray irrigation is applied up to the weekly maximum.
f. Spray irrigation of the lagoon volume is typically completed prior to the Fall deadline in the permit. However, the Operator has needed to request an additional week or two in the Fall due to late summer or early fall tropical storms, hurricanes or other heavy rain events that prevent spray irrigation of lagoon volume during the permitted season. These late season storms also increase lagoon volume.
g. Mr. DuBaere confirmed the emergency operation plan in case of high lagoon volume was to use local septage haulers to haul up to 10,000 gallons per trip to the Concord WWTF.

10. The Operator and Engineer observed the following:
    a. The Sunapee Lodge septic tank opening was observed. The cast iron manhole rim was slightly dislodged with cracked pavement along the edges. It is suggested that this be repaired to prevent runoff from nearby paved surfaces entering the tank.
    b. The Competition Center Septic Tank opening was observed. The surrounding area is graded to minimize runoff from entering the tank.
    c. The new Spruce Lodge septic tank openings were observed. The surrounding area is graded to minimize potential runoff from entering the tank openings.
    d. The septic tank effluent collection system manhole in Parking Lot #1 was observed. No deficiencies were observed.
    e. The Ski Patrol Building septic tank openings were observed. The surrounding area is graded to minimize runoff from entering the tank.
    f. The Snowmaking Building, Vehicle Maintenance Shop, Lift Maintenance Shop, and the unused septic tank near mini golf were not observed. The bathrooms in these buildings are reportedly used only by staff.
    g. The lagoon influent V-notch weir building was observed. The influent flow meter is reported to be calibrated yearly. The Operator noted difficulties with getting accurate readings from the flow meter, as it will occasionally read zero during a period of flow. The flow meter is battery operated and the batteries must be changed often in the winter. It is suggested that electricity be run to the influent building and a new influent flow meter be purchased. The building is not insulated and was observed to be in fair condition.
    h. The lagoon site area upgradient of the lagoons included a stormwater swale to intercept surface overland stormwater flow prior to entering the lagoons and to convey stormwater around and downgradient of the lagoons. The lagoon embankment toe of slope was observed near the effluent pump station. No signs of wetness or other deficiencies were observed.
    i. The lagoon cast-in-place concrete flow control structures were observed. Signs of distress in the cast-in-place concrete were observed including exposed rebar. It is recommended that a more thorough condition assessment be completed and alternatives for repair or replacement of this structure be developed and executed to mitigate future Facility operation failure.

j. The elevated bridge wooden decks were observed to be in fair to poor condition. It is recommended that a more thorough condition assessment be completed and alternatives for repair or replacement be implemented.
k. The spray irrigation effluent pump building was observed. The building siding and roof covering appear to be in fair to poor condition and needs maintenance or replacement. It appeared that most of the spray irrigation building site, process, mechanical, electrical and control system infrastructure components were original to the early 1970's construction with over 45 years of service. It is anticipated that most or all these components have exceeded their expected reliable service life. Mr. DuBaere indicated that Mount Sunapee Resort has considered some facility refurbishment in past years but found the projects were too costly. It is recommended that a more thorough condition assessment be completed and alternatives for repair or replacement of this infrastructure be developed and executed to help reduce the risk of future Facility operation failure. It is suggested that a standby pump be purchased, and the system be modified to allow its installation. Alternatively, a standby pump could be purchased and stored to be available in the event of active pump failure.
l. The above grade spray irrigation distribution Leg C (the leg closest to the lagoons) was observed. It is generally understood that this leg of the system has been in service for less than 20 years. No visible deficiencies were observed in the piping, risers, or spray heads mounted on the risers. The operator indicated that the spray heads are reliable. (Note the spray fields were not active on the day of the site visit).
m. The spray irrigation area site was observed. The vegetation was low and appeared to have been recently mowed. No trees were observed growing in the spray area clearing. A single sign is posted, identifying the spray area. It is suggested that consideration be given to further spray area boundary signage to reduce potential public exposure. Mount Sunapee is currently planning for a new parking lot that abuts the spray field. More signage should be considered along the edge of the parking lot. Consideration should also be given to boundary signage around the lagoons, as no warning signs were observed in that area.

11. Engineer provided assistance with development of the 2023 Groundwater Discharge Permit Renewal Application. Based upon review of this information, it is understood that the facility has been operated in a manner that met the facility permit conditions during the past 5 years.
12. Refer also to the attached Facility photos.
13. Engineer left the site at approximately 3:40 p.m.

Based upon review of the information provided by Mount Sunapee Resort during the Facility Permit renewal application development, site visit, and Operator interview, the Mount Sunapee Resort wastewater treatment system appears to be operated in a manner to meet expected treatment performance objectives of the groundwater discharge permit. Some of the facility components, however, are outdated. Many facility infrastructure components appear to have exceeded their useful service life. It is recommended that Mount Sunapee Resort commence planning to refurbish the influent building and flow monitoring equipment and effluent pumping facilities to improve reliability, redundancy and operator safety.

Should you require additional information, please contact me at (603) 460-5160 or via email at jducharme@hoyletanner.com.

Sincerely,
Hoyle, Tanner & Associates, Inc.

Joseph Ducharme, Jr., PE, BCEE
Senior Vice President / Division Manager-Municipal Engineering Services

Enclosure(s)

cc: Name



Lower lagoon, surface covered with duck weed.



Upper lagoons.



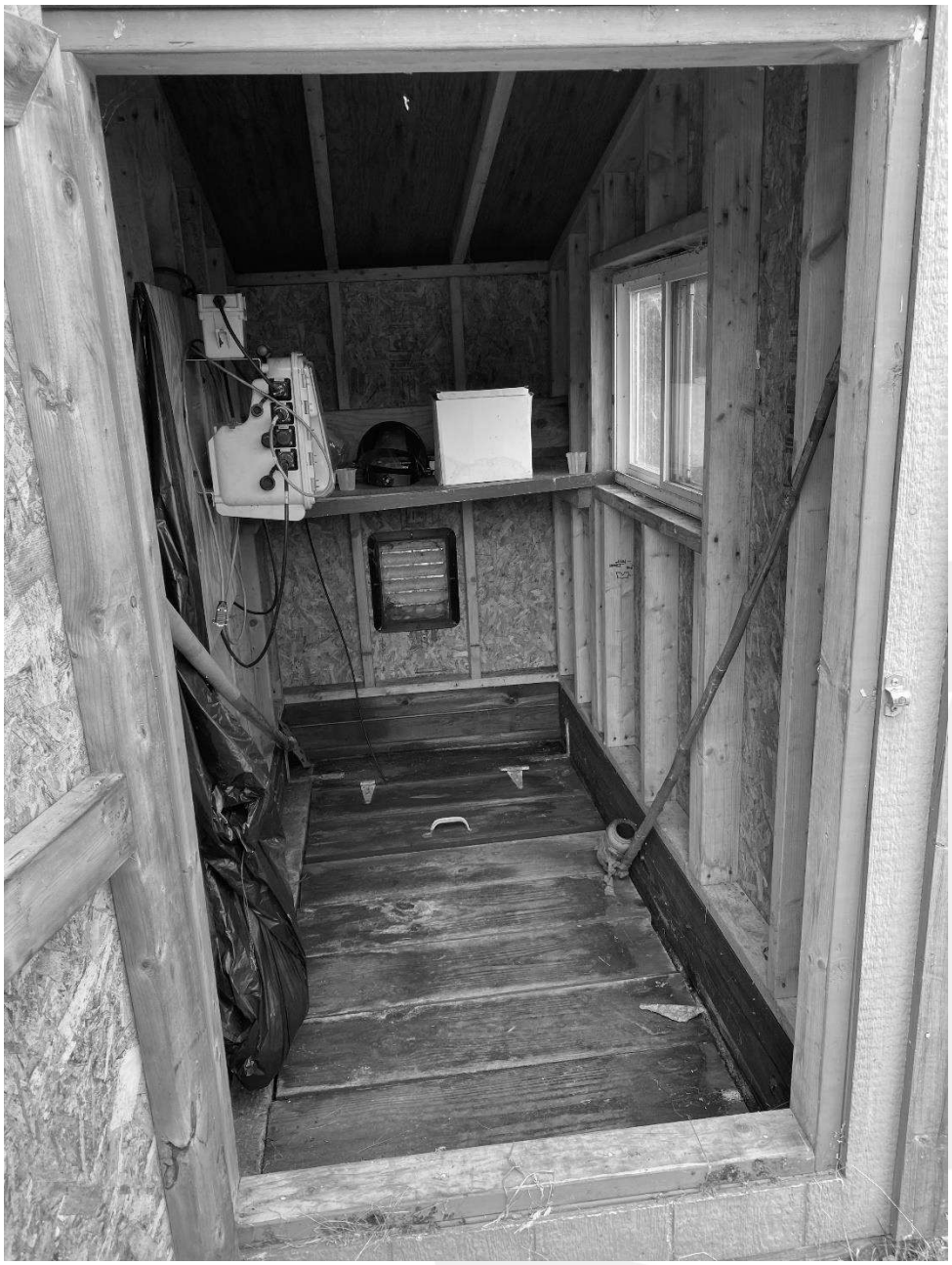
Wooden walkway and concrete flow control structure for the lower lagoon.



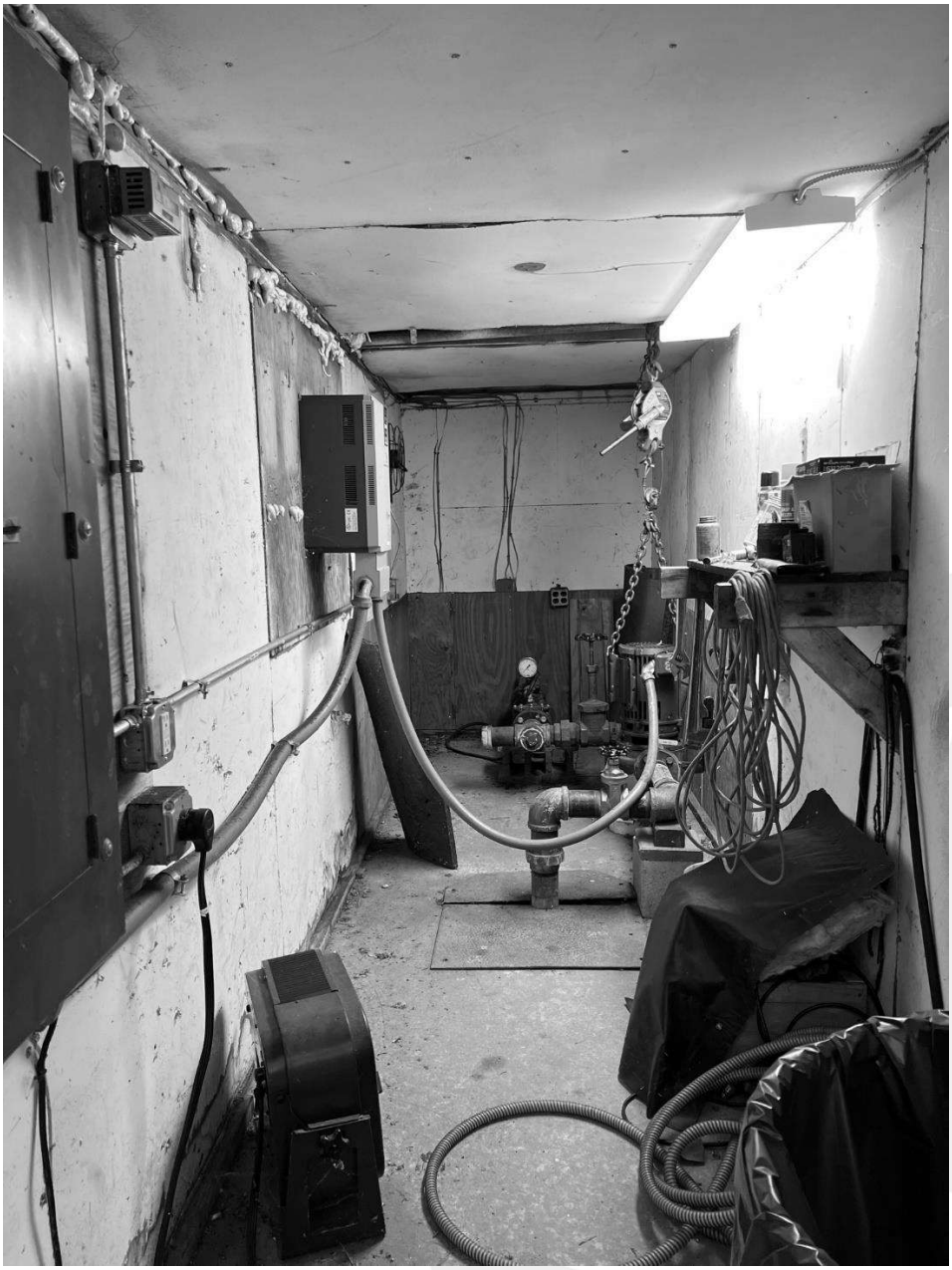
Competition Center septic tank covers.



Ski Patrol Building septic tank covers.



Inside of the influent V-notch weir building.



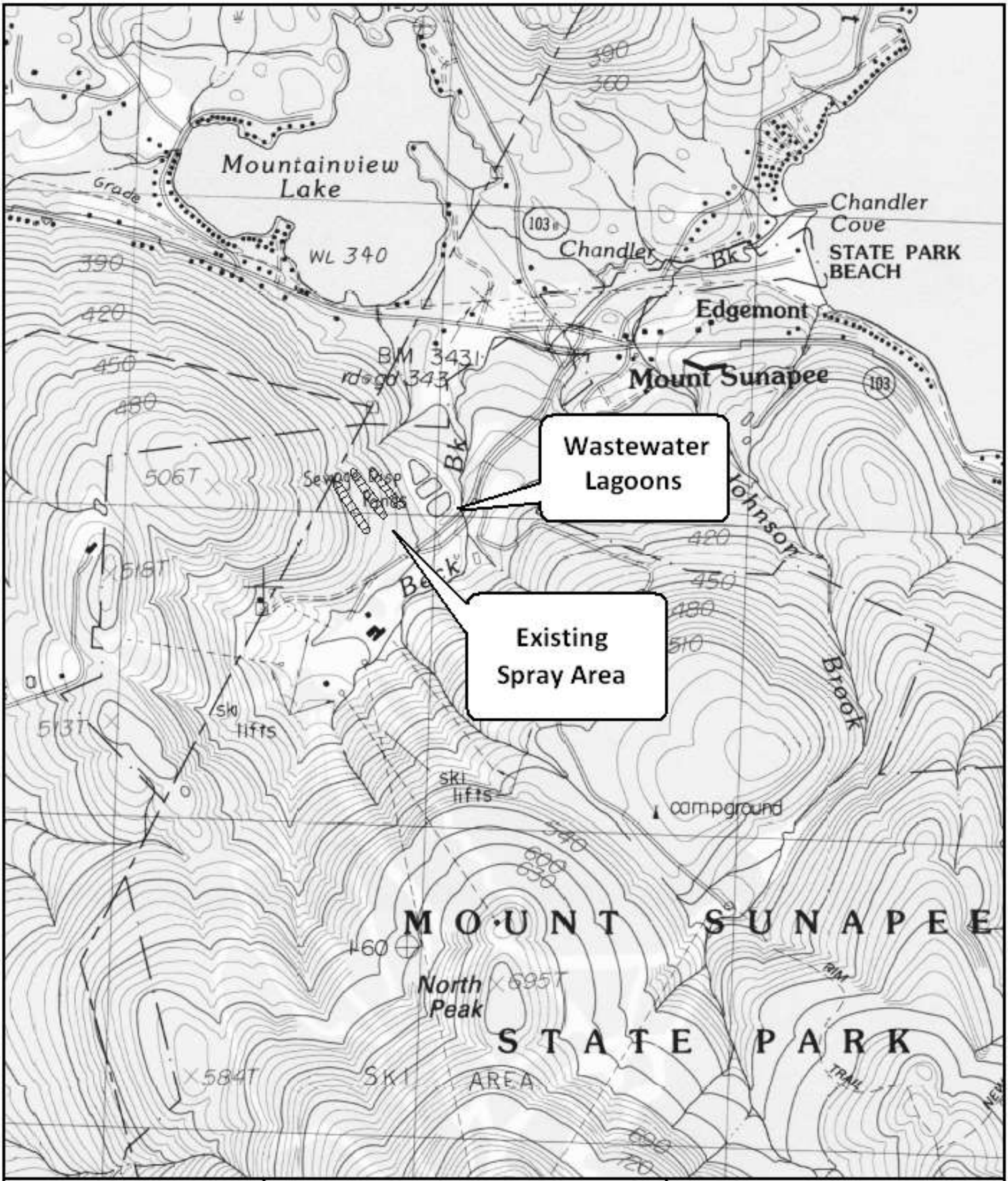
Spray irrigation effluent pump building.



Above grade spray irrigation distribution area for Spray Leg C (leg closest to the lagoons).



Posted signage at the entrance to the spray area.



Legend

Existing Spray Area

Mount Sunapee
Goshen and Newbury, NH
USGS Location Map
March 27, 2013

1000 0 2000 FEET

Sources: USGS Topographic Quadrangle, Newport (1984); spray expansion area digitized by VHBP (2009) and provided by Bruno Associates (2000); existing spray areas provided by VHBP (2010).

Hoyle, Tanner & Associates, Inc.

Mount Sunapee Resort

1398 Route 103
PO Box 103
Newbury, NH

ABUTTERS LIST for GWP Permit Renewal

Town of Newbury Properties within 1,000 feet:

1. Name: Allisen E. Heath Revocable Trust — Tax Map: 8 — Lot: 671-545
   Street: 46900 BERMONT RD UNIT 7
   City: Punta Gorda — State: FL — Zip: 33982
   Land Use: RES

2. Name: Mynczywor Revocable Trust — Tax Map: 8 — Lot: 509-401
   Street: 54 West Province Road
   City: Newbury — State: NH — Zip: 03255
   Land Use: RES

Town of Sunapee Properties within 1,000 feet:

1. Name: Heath Family Trust — Tax Map: 149 — Lot: 1
   Street: 200 Kearsarge Mountain Road
   City: Wilmot — State: NH — Zip: 03287
   Land Use: UNMNGD HARDWD

Town of Goshen Properties within 1,000 feet:

1. Name: The Heath Family Trust — Tax Map: 412 — Lot: 33
   Street: 200 Kearsarge Mountain Road
   City: Wilmot — State: NH — Zip: 03287
   Land Use: RES

Abutter Map

Tri Town, NH

1 inch = 548 Feet

0 548 1096 1644

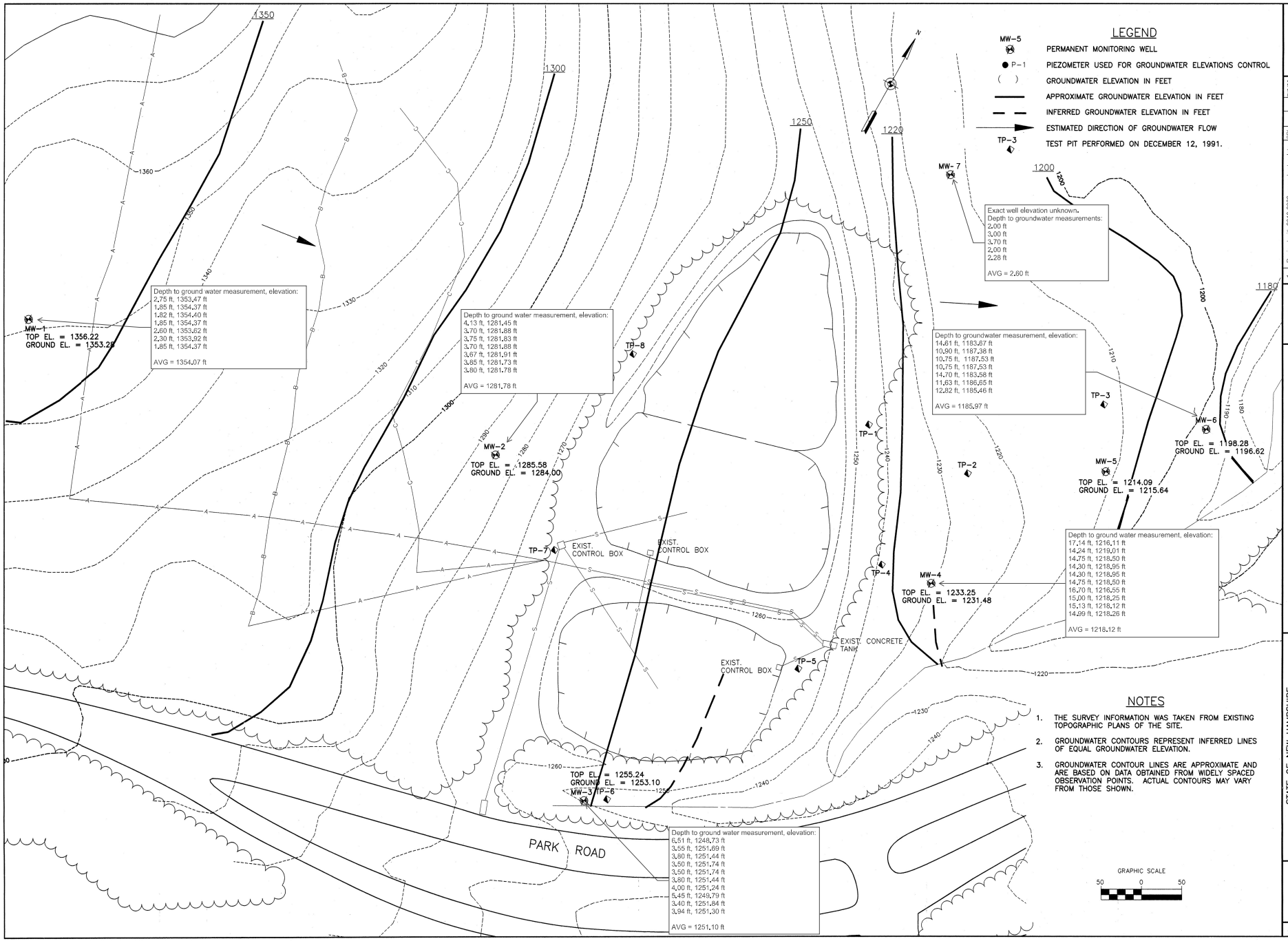
July 5, 2023

CAI Technologies
Precision Mapping. Geospatial Solutions.

www.cai-tech.com



Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.



NOTES

1. THE SURVEY INFORMATION WAS TAKEN FROM EXISTING TOPOGRAPHIC PLANS OF THE SITE.
2. GROUNDWATER CONTOURS REPRESENT INFERRED LINES OF EQUAL GROUNDWATER ELEVATION.
3. GROUNDWATER CONTOUR LINES ARE APPROXIMATE AND ARE BASED ON DATA OBTAINED FROM WIDELY SPACED OBSERVATION POINTS. ACTUAL CONTOURS MAY VARY FROM THOSE SHOWN.

ENGINEER/ARCHITECT

NO.	DESCRIPTION	DR. BY	CHKD. APPD. BY	DATE
1	Revised with 2018-2022 groundwater data	SDL		7/6/23

PROJECT NO. 23007
FILE NAME HYDROPLN
DO NOT SCALE DRAWING

Hoyle, Tanner & Associates, Inc. HTA engineers planners surveyors Companies
Five Commerce Park North, Bedford, New Hampshire 03102

SCALE: 1"=50' | DATE: JANUARY, 1992 | DES. BY P.O.B. | DR. BY K.A.R. | CHKD. BY P.O.B.

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

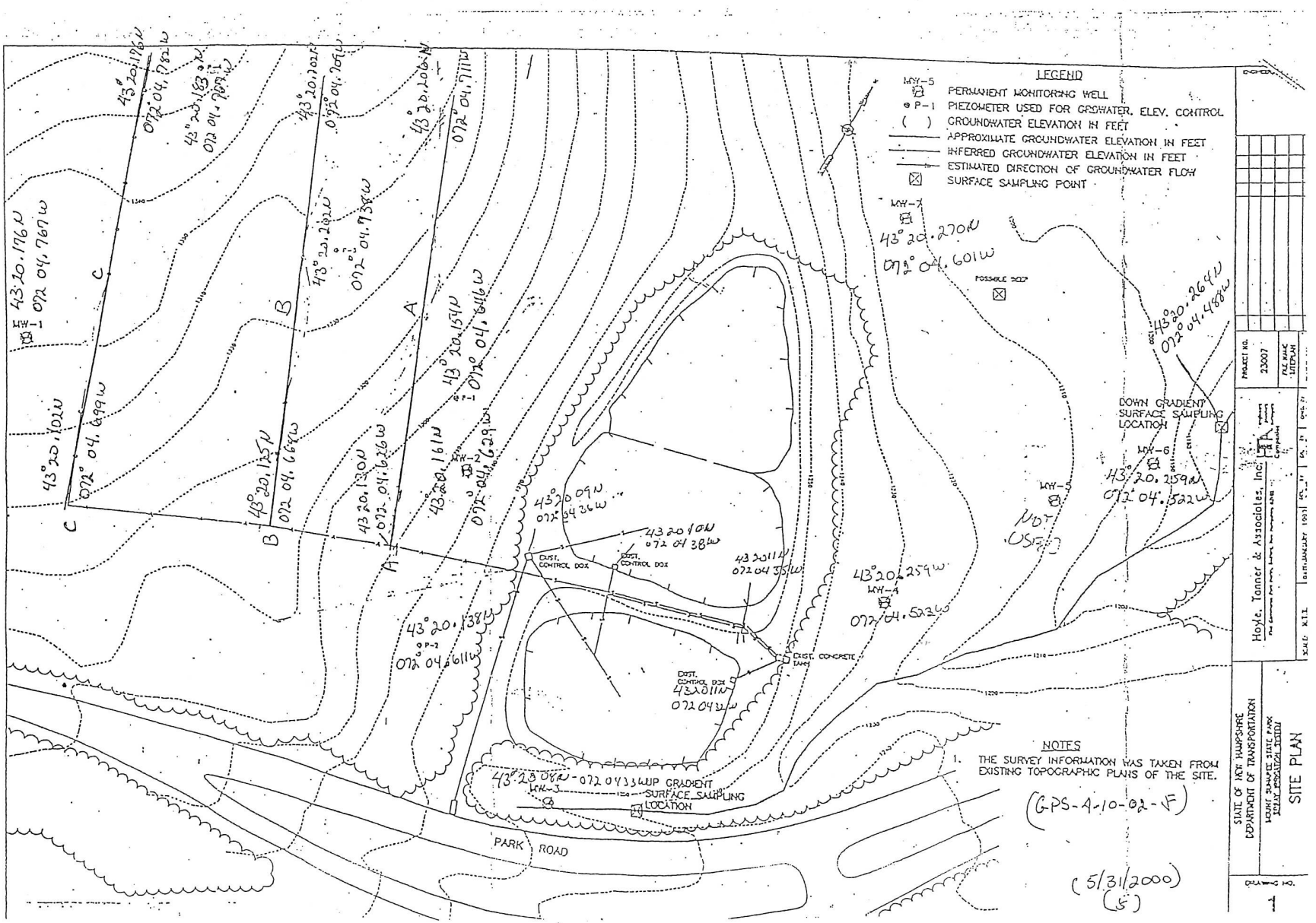
MOUNT SUNAPEE STATE PARK
SPOKY IRRIGATION SYSTEM

HYDROGEOLOGICAL PLAN

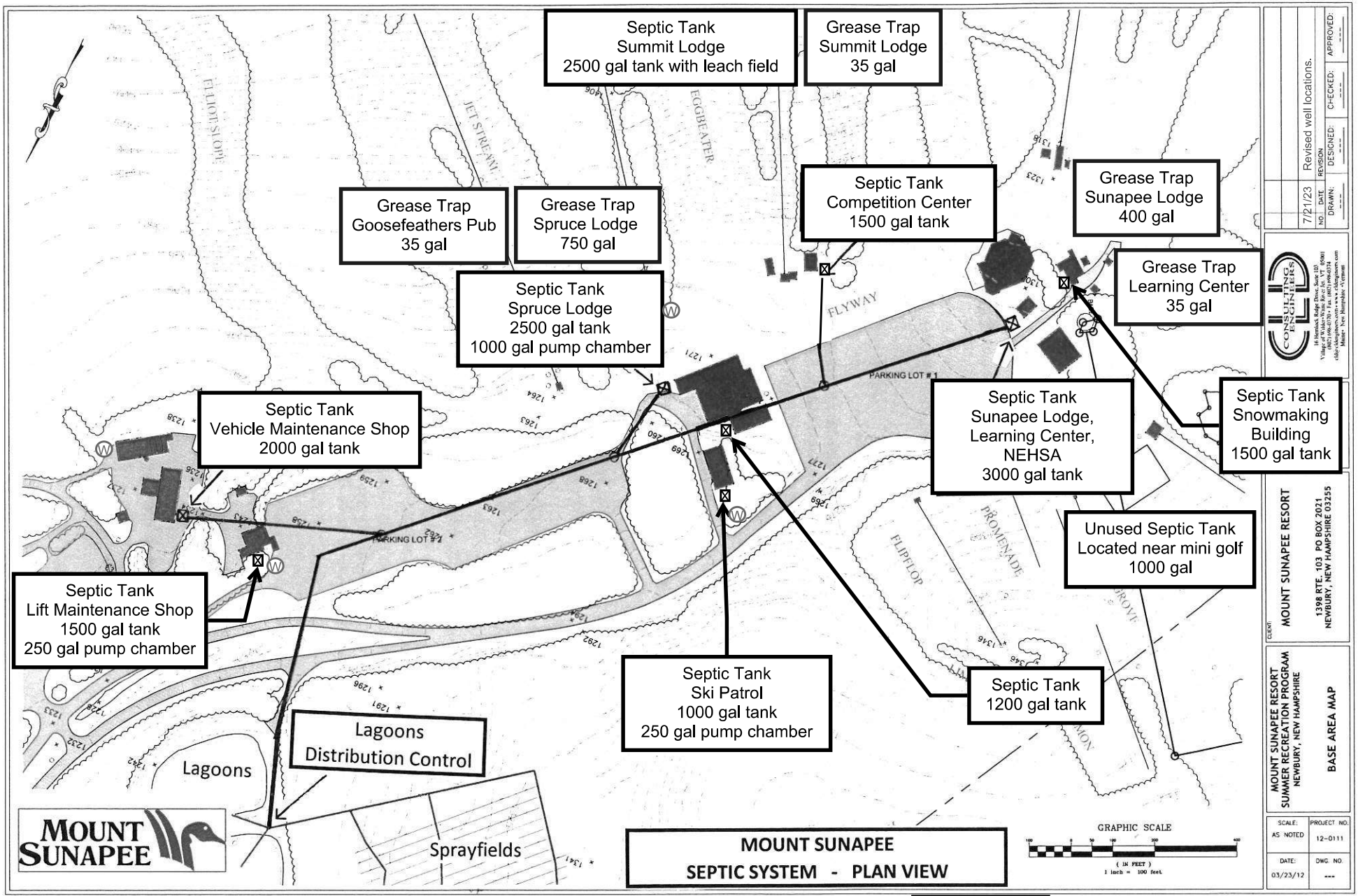
DRAWING NO.
H-1

SHEET 2 OF 4

Latitude & Longitude of Discharge Points Map (Datum: WGS 84)



Physical Structures, Buildings, Tanks, and Underground Utilities Associated with the Facility



APPENDIX A

MOUNT SUNAPEE

Five-Year Master Development Plan

2020–2025

June 2020

Prepared by:

SE GROUP

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CHAPTER ONE

Introduction

A. Location

The ski lease area for Mount Sunapee Resort includes approximately 968 acres of forested and developed land on the slopes of Mount Sunapee, in Newbury and Goshen, New Hampshire. See Figure I-1 for a regional location map. Ranging from approximately 1,230 feet elevation at the base of the ski slopes to 2,743 feet at the summit, forested natural communities follow a typical elevation derived transition from hardwood forests at the lower to mid-mountain slopes to sub-alpine spruce-fir forests at the summit. Mount Sunapee's slopes fall towards the southeastern shore of Lake Sunapee, while Lake Solitude, Mountainview Lake, and Rand Pond circle the mountain on southwestern, northern, and western sides, respectively. Pillsbury State Park lies to the south. Nearby peaks include Bald Sunapee to the east, Goves Mountain to the south, Thompson and Chandler Hills to the west and Blueberry Mountain to the north.

Mount Sunapee is located on northeast, north, west and southeast slopes. The steepest slopes on the mountain are in the North Peak area. Slopes are generally uniform below the ridgelines, with the steepest areas near the top and lowest grades at the bottom. The ski area is divided into four distinct areas by distinct sub-ridges: the Sunbowl area, the Sunapee area, the South Peak learning area, and the West Bowl area. This type of topography allows for a variety of developed and "off-piste" ski opportunities, though the distinct sub-ridges make connections between lift served "ski pods" complicated.[1] See Figure I-2 for a Slope Analysis.

The resort's distinct mountain peak affords exposures in many directions. Individual portions of developed runs have exposures to almost every aspect, but the majority of runs face north or northeast. Slope aspect plays an important role in snow quality and retention at this latitude. The variety of exposures present opportunities to provide a range of slope aspects that can respond to the changes in sun angle. The placement and location of snow features, such as half pipes and terrain parks, need to consider the effects of late season sun due to varying snow softening, melting and freezing depending on sun exposure.

[1] *off-piste*: skiing which occurs in areas that are un-groomed and in a natural condition; *ski pod*: a collection of ski trails/runs served by a common chairlift.

B. Land Ownership

Mount Sunapee Resort is located on lands owned by the State of New Hampshire and leased by VR NE Holdings, LLC and operated by The Sunapee Difference, LLC. Additional information is available in Appendix B (Lease and Operating Agreements) and includes a map and description of the leased premises; building inventory; a listing of assets and a space use description of the Sunapee Lodge, Spruce Lodge, and Summit Lodge. Appendix B includes the 2016 amended Lease.

The resort is in both Merrimack and Sullivan counties with approximately 900 acres in the Town of Newbury in Merrimack County and 68 acres in the town of Goshen in Sullivan County. Mount Sunapee Resort privately owns a total of 656 acres of land along the summit ridgeline south of Mount Sunapee (towards Pillsbury), and on the western flank of the mountain which is called the West Bowl. The expansion of the ski area into the West Bowl area is located on both private land and state land.

C. Current Ski Area Data

Mount Sunapee's alpine ski area operations are operated by The Sunapee Difference, LLC d/b/a Mount Sunapee Resort. Mount Sunapee is primarily a day-use resort, hosting most of its guests on weekends and during holiday periods.

Mount Sunapee currently has five aerial lifts, five surface lifts and sixty-seven developed Alpine trails including glades (tree skiing areas). Snowmaking coverage is provided on approximately 207 acres of terrain. There is currently no night skiing at the resort. Support facilities include two base lodges—Spruce Lodge and Sunapee Lodge, the Learning Center, the Ski and Snowboard Rental Shop, the Alpine Racing Competition Center, the on-mountain Summit Lodge and two maintenance facilities.

D. Purpose and Goals of the Master Development Plan

The Lease and Operating Agreement (the Agreement) originally dated April 30, 1998 between the State of New Hampshire and Okemo Mountain, Inc, which was assigned to VR NE Holdings as a successor to CNL Income Mount Sunapee, LLC on October 5, 2018, requires the Operator (The Sunapee Difference, LLC d/b/a Mount Sunapee Resort) to present a Master Development Plan (MDP) to the New Hampshire Department of Natural and Cultural Resources (a division of the now-dissolved Department of Resources and Economic Development [DRED]) for public notification, review and comment prior to DNCR approval:

The MDP shall be submitted to DRED on or before June 1, 2000, and thereafter the MDP shall be revised and submitted every five (5) years.[2] *An Environmental Management Plan (EMP) shall be developed and submitted for approval to DRED in conjunction with the MDP. An Annual Operating Plan (AOP) shall be submitted on or before May 15 of each year.*

Mount Sunapee Resort presents this MDP to the State of New Hampshire in accordance with the terms of the Lease and Operating Agreement. It is also provided to the Towns of Newbury and Goshen, and other local communities in the Lake Sunapee region.

The MDP includes plans for the potential expansion the ski trail network, construction of new lifts, construction and/or renovation of lodges or other facilities, expansion of snowmaking and additional withdrawals from Lake Sunapee, upgrades or modifications to infrastructure including power, water and sewage disposal systems, and other improvements for the recreational use of the leased premises.

The many projects described in this MDP represent both short-term and long-term plans, providing our vision for maintaining the overall facilities at Mount Sunapee.

This document serves as a "road map" for future planning. As such it is a broad overview of the ***major*** projects proposed for Mount Sunapee. More detailed planning will be required prior to implementation of many of the projects, and changes to the plan may occur during these future planning and design exercises which will be addressed in the AOP. Minor projects which are not described in the MDP may be proposed and described in the AOP for approval.

E. Project Summary

This MDP describes potential upgrading and expansion of Mount Sunapee's lifts, terrain, guest services, parking, infrastructure, and multi-season activities. Many of the projects described in the MDP have been proposed and approved in previous MDP submittals. Due to various constraints such as financial resources, permitting, competitive positioning and realignment of priorities, some of these projects have not been implemented to date.

The on-mountain and base area improvements are listed in the following table.

[2] As noted, with the dissolution of DRED, the 2020 MDP document is submitted to the Department of Natural and Cultural Resources.

Table 1. Project Summary

Project Description	Previously Approved, Not Yet Implemented	Previously Proposed, Not Yet Approved	Newly Proposed
	Year Approved	Year Introduced	2020
LIFTS			
Upgrade the North Peak Triple to a quad chair	2000		
Upgrade Spruce Triple to a quad chair	2000		
Remove Duckling Double chair*	2000		
Install Cataract chairlift from Sunbowl base to North Peak summit	2005		
Upgrade Sunapee Express Quad to 6-passenger express (with possible addition of gondola cabins)	2016		
Install a 5,100' high-speed express quad chairlift – West Bowl	2016		
Install a moving carpet/beginner lift – West Bowl	2016		
Install telecord surface lift from parking lot #3 to Spruce Lodge			X
TERRAIN/SNOWMAKING			
Add night lighting to South Peak, Spruce Peak, and North Peak trails	2000		
Widen Jet Stream & Pipeline	2005		
Add Snowmaking to Williamson trail	2000		
Add Snowmaking to Paradise trail	2005		
Widen Upper & Lower Blast Off	2000		
Construct two new trails between Upper Ridge & Lower Blast Off	2005		
Construct Upper Outer Ridge trail	2000		
Construct Cataract run trail	2005		

Table 1. Project Summary (*cont.*)

Project Description	Previously Approved, Not Yet Implemented	Previously Proposed, Not Yet Approved	Newly Proposed
	Year Approved	Year Introduced	2020
TERRAIN/SNOWMAKING (cont.)			
Construct and install snowmaking on new South Peak trail	2009		
Widen lower half of Lift Line trail	2009		
Widen and extend Paradise trail	2009		
Widen Williamson & Stovepipe trails	2009		
Create new trail and terrain park between Pipeline and Elliot Slope along the old T-Bar line	2009		
Widen a small section of Province trail	2009		
Add snowmaking on a winter work road from the Sunbowl for winter maintenance vehicles	2009		
Construct +/- 75 acres of new terrain including four (4) top-to-bottom ski trails – West Bowl	2016		
Regrade South Peak (carpet conveyor areas)			X
GUEST SERVICES			
Renovate and expand Summit Lodge	2000		
Renovate and expand Spruce Lodge	2000		
Renovate and expand Sunapee Lodge	2000		
Construct a new base area facility with limited guest services – West Bowl	2016		
Install warming yurt at the base of South Peak			X
Renovate Ray's House/Warming Hut			X

Table 1. Project Summary (*cont.*)

Project Description	Previously Approved, Not Yet Implemented	Previously Proposed, Not Yet Approved	Newly Proposed
	Year Approved	Year Introduced	2020
INFRASTRUCTURE/PARKING			
Construct new parking lot #4	2000		
Install 480V/3P power along Bowl Road	2000		
Expand existing lagoon spray field lines	2000		
Install utilities and infrastructure (power, water, roads) – West Bowl	2016		
Construct new parking areas – West Bowl	2016		
Add a grip maintenance and storage barn to Sunbowl lift			X
Route water supply to Summit Lodge			X
MULTI-SEASON			
Install tubing runs	2000		
Install a mountain coaster between Lynx and Hansen-Chase trails		Pending	
Construct additional archery lanes			X
Construct additional mountain bike trails on South Peak			X
Base area grading around Sunapee Lodge to improve wedding & special event access			X

CHAPTER TWO

Existing Ski Resort Facilities

This section contains an examination and analysis of existing ski facilities at Mount Sunapee. The resort inventory is the first step in the evaluation process and involves the collection of data pertaining to Mount Sunapee's existing facilities: ski lifts, ski trails, the snowmaking system, grooming capabilities, base area structures, skier services and day-use parking. The analysis of the inventory data involves the application of ski industry standards to Mount Sunapee's existing conditions and compares Mount Sunapee's existing ski facilities to those facilities commonly found at other North American ski resorts of similar size and composition.

The overall balance of the existing ski area is evaluated by calculating the skier capacities of Mount Sunapee's various facility components and then comparing these capacities to the ski area's Comfortable Carrying Capacity (CCC). This examination of capacities helps to identify the ski resort's strengths and weaknesses. The proposed Upgrade Plan responds to the findings of this analysis, including improvements that bring the existing ski area into better equilibrium and help the resort meet the ever-changing needs of their skier marketplace. Accomplishing both objectives would ultimately enhance Mount Sunapee's competitive positioning and financial performance.

A. Existing Lift Network

Mount Sunapee's existing lifts service the terrain efficiently and are generally newer lifts. The lifts have been well maintained and are in good working order.

In 2014, the Sunbowl Lift was upgraded to a high-speed quad, an upgrade that reduces ride times and increases efficient circulation between parts of the mountain.

Table 2. Lift Specifications – Existing Conditions

Lift Name, Lift Type	Vertical Rise (ft)	Slope Length (ft)	Avg. Grade (%)	Hourly Capacity (pph)	Rope Speed (fpm)	Carrier Spacing (ft)	Lift Maker/ Year Installed
Sunbowl Quad/*DC4*	1,058	4,292	26	2,400	1,000	100	Poma/2014
Spruce Triple/*C3*	417	1,940	23	1,600	425	48	Doppelmayr/ 1985
North Peak Triple/C3	965	3,254	31	1,800	450	45	Doppelmayr/ 1987
Sunapee Express/*DC4*	1,402	6,056	24	2,650	950	86	Poma/1998
Piggyback/*HT*	34	300	14	400	200	30	Borer/1994
Clipper Ship Quad/*C4*	374	1,814	19	1,600	425	64	Poma/2000
Boardwalk/*RT*	30	200	13	250	100	24	Bruckschlogl/ 1997
Little Carpet/*C*	8	90	9	400	50	8	Bruckschlogl/ 2000
Flying Carpet/*C*	48	360	17	800	100	8	Bruckschlogl/ 2002
Middle Carpet/*C*	14	130	11	800	100	8	Carpet/2011

Notes:
C3 = fixed-grip triple chairlift / *C4* = fixed-grip quad chairlift / *DC4* = detachable four-passenger chairlift
HT = handle-tow surface lift / *RT* = rope-tow surface lift / *C* = carpet

B. Existing Ski Terrain Network

The existing developed ski terrain network at Mount Sunapee covers approximately 217 acres, with an additional approximately 17 acres of gladed terrain for a total of 234 acres of skiing. The maximum vertical drop of the ski trail network is approximately 1,510 feet—from the top of the mountain to the bottom of the Spruce Triple lift.

Importance of Terrain Variety

Terrain variety is the key factor in evaluating the quality of the actual skiing and riding guest experience (as opposed to lift quality, restaurant quality, or any other factor).

Terrain variety is consistently ranked as one of the most important criteria in skiers' choice of a ski destination, typically behind only snow quality, and ahead of such other considerations as lifts, value, accessibility, resort service, and others. This is a relatively recent industry trend, representing an evolution in skier/rider tastes and expectations. The implication of the importance of terrain variety is that a resort must have a diverse, interesting, and well-designed developed trail system, but also must have a wide variety of alternate-style terrain, such as mogul runs, bowls, gladed trees, open parks, in-bounds "backcountry-style" (i.e., hike-to) terrain, and terrain parks and pipes. At resorts across the nation, there is a growing trend favoring these more natural, unstructured types of terrain, since the availability of this style of terrain has become one of the more important factors in terms of a resort's ability to retain guests, both for longer durations of visitation and for repeat business.

To provide the highest quality guest experience, resorts should offer groomed runs of all ability levels and some level of each of the undeveloped terrain types. Undeveloped terrain is primarily used by advanced and expert level skiers/riders during desirable conditions (e.g., periods of fresh snow, spring corn, etc.). Even though some of these types of terrain only provide skiing/riding opportunities when conditions warrant, they represent the most intriguing terrain, and typically are the areas that skiers/riders strive to access. Terrain variety is increasingly becoming a crucial factor in guests' decisions on where to visit.

MOUNT SUNAPEE

Table 3. Terrain Specifications – Existing Conditions

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
Beck Brook	2,019	1,759	261	1,928	66	2.9	14%	30%	Low Intermediate
Bonanza	2,691	2,143	548	2,365	133	7.2	24%	38%	Intermediate
Byway	2,062	1,947	114	526	51	0.6	22%	28%	Low Intermediate
Calypso	1,542	1,374	168	945	108	2.3	18%	29%	Low Intermediate
Chase Ledges	2,147	1,685	462	2,109	107	5.2	23%	43%	Advanced Intermediate
Chipmunk	2,094	1,321	774	3,817	112	9.8	21%	29%	Low Intermediate
Coconut Grove	1,362	1,295	67	564	257	3.3	12%	17%	Novice
East Side	2,357	2,132	226	1,239	79	2.2	19%	28%	Low Intermediate
Eggbeater	1,660	1,275	385	1,911	175	7.7	21%	32%	Low Intermediate
Elliot Slope	1,672	1,260	412	2,413	116	6.4	17%	35%	Intermediate
Explorer	1,661	1,361	300	2,152	101	5.0	14%	25%	Novice
Fin	1,310	1,295	15	355	74	0.6	4%	8%	Novice
Flip Flop	1,344	1,278	67	498	221	2.5	14%	18%	Novice
Flyway	1,316	1,267	49	1,083	193	4.8	5%	10%	Low Intermediate
Fox Run	2,243	2,036	208	1,731	43	1.7	12%	27%	Low Intermediate
Goosebumps	2,246	1,621	625	1,944	74	3.3	34%	53%	Expert

Table 3. Terrain Specifications – Existing Conditions (*cont.*)

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
Guster	1,672	1,592	80	795	44	0.8	10%	13%	Low Intermediate
Hansen Chase	1,692	1,323	369	1,595	152	5.6	24%	31%	Low Intermediate
Jet Stream	1,660	1,265	395	2,115	143	7.0	19%	34%	Intermediate
Kartwheel	1,965	1,729	236	888	72	1.5	28%	39%	Intermediate
Kick Back	2,135	1,993	142	649	117	1.7	23%	29%	Low Intermediate
Lemon	1,385	1,335	50	401	121	1.1	13%	15%	Novice
Liftline	2,405	2,000	405	1,583	134	4.9	27%	35%	Intermediate
Lime	1,346	1,309	37	432	41	0.4	9%	13%	Novice
Lower Blast Off	2,038	1,322	715	3,993	90	8.3	18%	33%	Intermediate
Lower Cataract	1,866	1,666	200	903	105	2.2	23%	36%	Intermediate
Lower Crossover	2,300	2,247	52	351	51	0.4	15%	25%	Low Intermediate
Lower Flying Goose	1,641	1,296	345	1,388	123	3.9	26%	35%	Intermediate
Lower Ridge	1,771	1,316	455	3,054	115	8.1	15%	24%	Low Intermediate
Williamson	2,472	1,673	800	5,071	54	6.3	16%	24%	Low Intermediate
Lower Wingding	1,996	1,666	331	1,735	116	4.6	20%	33%	Intermediate
Lynx	2,235	1,306	929	3,151	134	9.7	31%	47%	Advanced Intermediate

Table 3. Terrain Specifications – Existing Conditions (*cont.*)

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
Middle Wingding	2,360	1,996	363	1,462	176	5.9	26%	40%	Intermediate
Old Goat	2,656	2,608	48	359	37	0.3	14%	25%	Low Intermediate
Outer Ridge	2,206	1,871	335	2,120	56	2.7	16%	31%	Low Intermediate
Paradise	1,647	1,485	162	1,195	59	1.6	14%	19%	Novice
Pipeline	1,679	1,260	420	2,108	176	8.5	20%	31%	Low Intermediate
Porky's	2,711	2,633	78	556	48	0.6	14%	36%	Intermediate
Portage	1,624	1,525	99	543	57	0.7	19%	26%	Low Intermediate
Promenade	1,334	1,292	43	327	148	1.1	13%	17%	Novice
Little Carpet/Broadwalk	1,295	1,323	28	168	120	1.5	10%	10%	Beginner
Province	1,661	1,298	363	2,286	110	5.8	16%	28%	Novice
Skyway Ledges	2,690	2,493	197	1,006	80	1.9	20%	37%	Intermediate
Skyway	2,621	2,078	543	2,250	124	6.4	25%	37%	Intermediate
Smooth Sail'n	1,425	1,295	130	930	118	2.5	14%	22%	Novice
Spinnaker	1,598	1,382	215	823	49	0.9	27%	36%	Intermediate
Sundance	2,015	1,866	149	794	107	1.9	19%	29%	Low Intermediate
Sunnyside Down	1,391	1,353	38	396	55	0.5	10%	18%	Novice

Table 3. Terrain Specifications – Existing Conditions (*cont.*)

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
Sunrise Glades	0	0	0	-	0	0.0	0%	0%	Expert
Toboggan Chute	2,233	2,048	185	1,660	58	2.2	11%	21%	Low Intermediate
Upper Blast Off	2,657	2,038	619	2,486	93	5.3	26%	38%	Advanced Intermediate
Upper Cataract	2,199	1,861	338	1,235	118	3.3	29%	39%	Advanced Intermediate
Upper Crossover	2,472	2,426	46	480	37	0.4	10%	11%	Low Intermediate
Upper Flying Goose	2,242	1,641	601	1,815	140	5.8	35%	43%	Advanced Intermediate
Upper Hansen Chase	2,245	2,091	153	793	90	1.6	20%	31%	Advanced Intermediate
Upper Ridge	2,711	1,771	940	5,875	108	14.5	16%	31%	Low Intermediate
Stovepipe	2,604	2,472	132	929	43	0.9	14%	27%	Low Intermediate
Upper Wingding	2,684	2,360	324	1,377	141	4.4	24%	32%	Intermediate
Westside	2,488	2,158	330	1,564	97	3.5	22%	37%	Intermediate
TOTAL				89,218		217.2			

Overall, the trail network is well balanced and efficient.

The utilization of the Sunbowl side of the mountain has been improved with the upgrading of the Sunbowl lift.

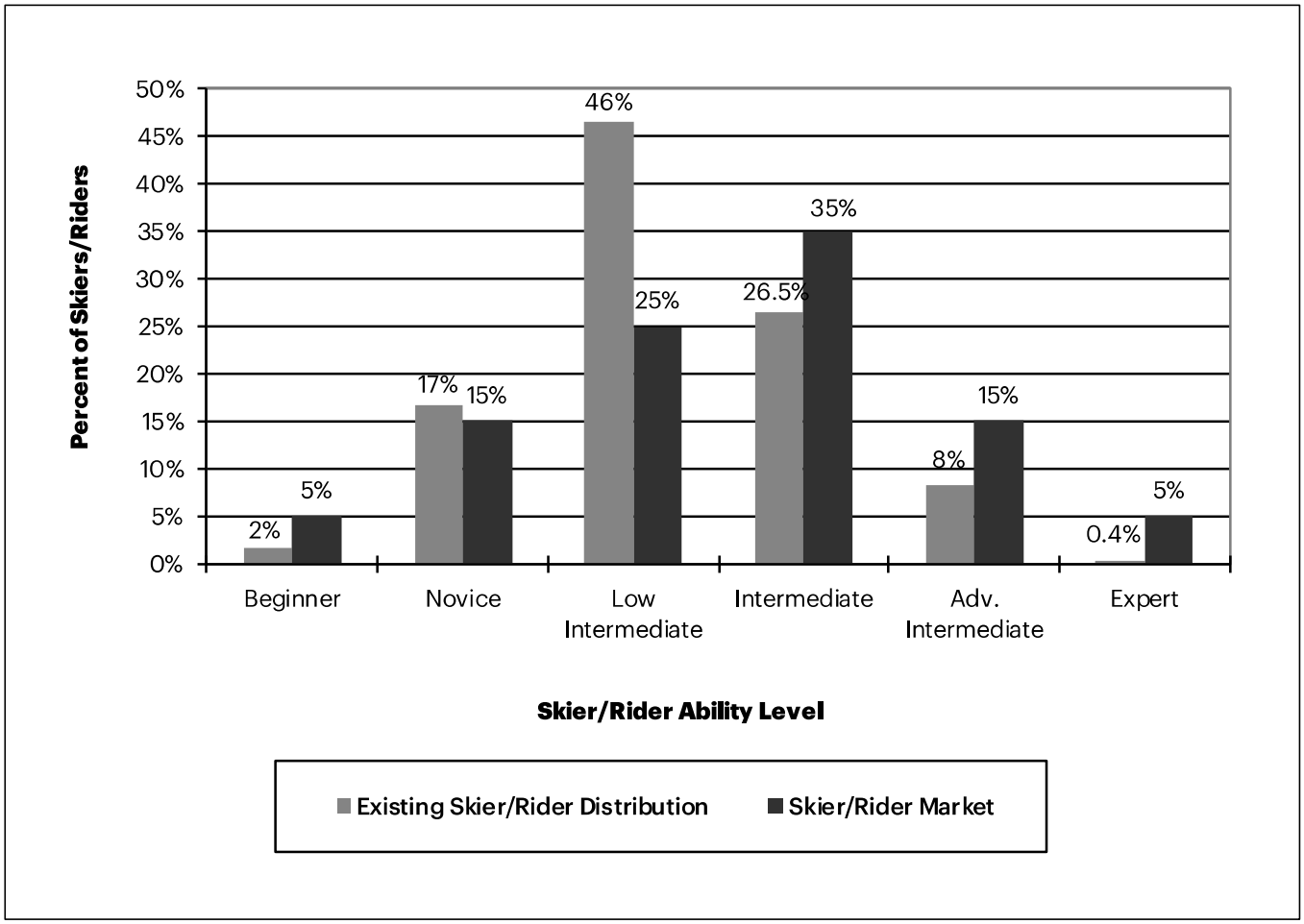
The western side of the existing mountain is underutilized by intermediate skiers due to some narrow/steep sections on the Upper Ridge run that are on the high end of intermediate level terrain, and as a result are often congested. There are good opportunities to increase the amount of intermediate level terrain in this area on the mountain. The overall mountain currently has a deficit of intermediate terrain.

The following terrain distribution exhibits show that the trail network at Mount Sunapee accommodates a range of skier ability levels—from beginner to expert. There is a shortage of Beginner, Intermediate, Advanced Intermediate, and Expert terrain, and a surplus of Novice and Low Intermediate terrain. The significant surplus of Novice and Low Intermediate terrain skews the rest of the percentages. However, this is reflective of Mount Sunapee's target market. Since Mount Sunapee is positioned as a family-oriented, lower ability level resort within the region, the abundance of lower level terrain is a positive attribute. The shortage of expert terrain is mitigated by the existing gladed areas.

Table 4. Terrain Distribution by Ability Level – Existing Conditions

Skier/Rider Ability Level	Trail Area (acres)	Skier/Rider Capacity (guests)	Skier/Rider Distribution (%)	Skier/Rider Market (%)
Beginner	1.5	45	2%	5%
Novice	24.5	441	17%	15%
Low Intermediate	87.4	1224	46%	25%
Intermediate	69.6	696	26.4%	35%
Advanced Intermediate	30.9	216	8%	15%
Expert	3.3	10	0.4%	5%
TOTAL	217.2	2,632	100%	100%

Chart 1. Terrain Distribution by Ability Level – Existing Conditions



C. Existing Capacity Analysis

1. Comfortable Carrying Capacity

The CCC of the lift and trail network at Mount Sunapee is about 4,820 guests per day. It is not uncommon for ski areas to experience peak days during which skier visitation exceeds the CCC by as much as 25%. However, it is not recommended to consistently exceed the CCC due to the resulting decrease in the quality of the recreational experience, and thus the resort's repeat business.

Mount Sunapee's existing CCC is 4,820, as described in the following table.

The daily carrying capacity of a resort is described as the Comfortable Carrying Capacity (CCC). CCC is not a cap on visitation but is rather a design standard defined as the number of daily visitors a resort can comfortably or efficiently accommodate at one time without overburdening the resort infrastructure.

CCC is a guest attendance level that can be serviced by the resort while operations remain optimally functional. The CCC is derived from the resort's *supply of vertical transport* (the combined uphill hourly capacities of the lifts) and *demand for vertical transport* (the aggregate number of runs demanded multiplied by the vertical rise associated with those runs). The CCC is calculated by dividing vertical supply (VTF/Day) by Vertical Demand.

The accurate estimation of a ski area's CCC is a complex issue and is the single most important planning criterion for the ski area. All other related skier service facilities can be planned based on the proper identification of the mountain's capacity.

Table 5. Comfortable Carrying Capacity – Existing Conditions

Lift Name, Lift Type	Slope Length (ft)	Vertical Rise (ft)	Hourly Capacity (pph)	Oper. Hours (hrs)	Access Role (%)	Misload Stopping (%)	Adjusted Hourly Capacity (pers/hr)	VTF/Day (000)	Vertical Demand (ft/day)	CCC (guests)
Sunbowl Quad/*DC4*	4,292	1,058	2,400	7.00	10	5	2,040	15,108	13,467	1,120
Spruce Triple/*C3*	1,940	417	1,600	7.00	0	10	1,440	4,203	7,402	570
North Peak Triple/*C3*	3,254	965	1,800	7.00	10	10	1,440	9,727	14,223	680
Sunapee Express/*DC4*	6,056	1,402	2,650	7.00	15	5	2,120	20,806	16,809	1,240
Piggyback/*HT*	300	34	400	7.00	0	20	320	76	850	90
Clipper Ship Quad/*C4*	1,814	374	1,600	7.00	0	10	1,440	3,770	4,622	820
Boardwalk/*RT*	200	30	250	7.00	0	20	200	42	1,475	30
Little Carpet/*C*	90	8	400	7.00	0	20	320	18	370	50
Flying Carpet/*C*	360	48	800	7.00	0	20	640	215	1,408	150
Middle Carpet/*C*	130	14	800	7.00	0	20	640	63	868	70
TOTAL	**18,436**		**12,700**				**10,600**	**54,028**		**4,820**

Notes:
C3 = fixed-grip triple chairlift / *C4* = fixed-grip quad chairlift / *DC4* = detachable four-passenger chairlift
HT = handle-tow surface lift / *RT* = rope-tow surface lift / *C* = carpet

2. Density Analysis

Overall, there is a good balance between downhill terrain capacity and uphill lift capacity at Mount Sunapee. This desirable situation is reflected in the moderate skier densities.

The only area with densities at or above desirable densities is the novice terrain serviced by the Piggyback handle tow. However, even though the terrain off this lift is classified as Novice due to its 14% grade, it functions more as a higher-level beginner area. Densities are not a concern in beginner areas, since many of the skiers are clustered on the sides of the runs, in group lessons, or similar situations. As a result, the higher density index number for the Piggyback handle tow is not a concern.

An important aspect of ski area design is the balancing of uphill lift capacity with downhill trail capacity. Trail densities are derived by contrasting the uphill, at-one-time capacity of each lift system (CCC) with the trail acreage associated with each lift pod. At any one time, skiers are dispersed throughout the resort, while using guest facilities and milling areas, waiting in lift mazes, riding lifts, or enjoying descents. For the trail density analysis, 25% of each lift's capacity is presumed to be using guest service facilities or milling areas. This 25% of the skier population is the resort's inactive population.

The active skier population can be found in lift lines, on lifts, or on trails. The number of skiers waiting in line at each lift is a function of the uphill hourly capacity of the lift and the assumed length of wait time at each lift. The number of guests on each lift is the product of the number of carriers on the uphill line and the capacity of the lift's carriers. The remainder of the skier population (the CCC minus the number of guests using guest facilities, milling in areas near the resort portals, waiting in lift mazes, and riding lifts) is assumed to be enjoying downhill descents.

Trail density is calculated for each lift pod by dividing the number of guests on the trails by the amount of trail area that is available within each lift pod. The trail density analysis compares the calculated trail density for each lift pod to the target trail density for that pod (i.e., the product of the ideal trail density for each ability level and the lift's trail distribution by ability level).

Table 6. Density Analysis – Existing Conditions

Lift Name, Lift Type	CCC	Guest Dispersement				Density Analysis				
		Support Facility/ Milling (guests)	Lift Lines (guests)	On Lift (guests)	On Terrain (guests)	Terrain Area (acres)	Terrain Density (guests/ac)	Target Trail Density (guests/ac)	Diff. (+/-)	Density Index (%)
Sunbowl Quad/*DC4*	1,120	280	218	146	476	52.7	9	11	-2	82%
Spruce Triple/*C3*	570	143	168	110	149	27.0	6	12	-6	50%
North Peak Triple/*C3*	680	170	192	174	144	27.0	5	10	-5	50%
Sunapee Express/*DC4*	1,240	310	177	225	528	82.1	6	12	-6	50%
Piggyback/*HT*	90	23	37	8	22	1.2	18	18	0	100%
Clipper Ship Quad/*C4*	820	205	204	102	309	21.8	14	17	-3	81%
Boardwalk/*RT*	30	8	7	7	8	0.9	9	29	-20	31%
Little Carpet/*C*	50	13	16	10	11	0.8	15	30	-15	50%
Flying Carpet/*C*	150	38	32	38	42	2.6	16	18	-2	89%
Middle Carpet/*C*	70	18	21	14	17	1.3	13	18	-5	72%
Sunbowl Quad/*DC4*	1,120	280	218	146	476	52.7	9	11	-2	82%
TOTAL	**4,820**	**1,208**	**1,072**	**834**	**1,706**	**217.2**	**8**	**12**	**-4**	**65%**

Notes:
C3 = fixed-grip triple chairlift / *C4* = fixed-grip quad chairlift / *DC4* = detachable four-passenger chairlift
HT = handle-tow surface lift / *RT* = rope-tow surface lift / *C* = carpet

D. Maintenance Facilities, Utilities, and Snowmaking Coverage

1. Maintenance Facilities

Mount Sunapee has three primary maintenance facilities. The vehicle maintenance facility has a five-bay garage and a stock room where maintenance of all rolling stock takes place. The service shop is a three-bay facility and is the location of buildings and grounds maintenance, lift maintenance, and carpentry. The snowmaking control building houses the electric air compressors and all snowmaking maintenance and storage. The resort's maintenance facilities have been renovated since the last MDP.

2. Utilities

Mount Sunapee has an onsite wastewater disposal system, consisting of septic tanks at each building and a lagoon and spray field system for final treatment. The base area has a combined treatment capacity of 13,500 gallons per day. The Summit Lodge has a septic tank with a leach field with a treatment capacity of 5,000 gallons per day. The Summit Lodge leach field was replaced in 2006. All systems are considered adequate to accommodate current and future use.

Fuel storage is accomplished in multiple locations around the resort, in both underground and above ground tanks. #2 fuel is stored in underground tanks adjacent to respective buildings, ranging in size from 3,000 gallons to 10,000 gallons. Propane is stored in above ground and below ground tanks throughout the resort, ranging in size from 100 gallons to 2,000 gallons. Diesel fuel is stored in a 6,000-gallon underground tank at the service shop, and gasoline is also stored in a 6,000-gallon underground tank at the service shop. The diesel and gasoline tanks at the service shop were replaced with new double walls tanks in 2012. All tanks comply with the applicable codes.

Transmission and distribution of electrical power to Mount Sunapee is from Public Service New Hampshire (PSNH), a commercial supplier. Power is distributed throughout the resort via underground power lines and is considered adequate for current and future use.

Domestic water needs at Mount Sunapee are met by private wells. There is a 2,000 gallon underground tank in the base area fed by a 73-gallon per minute well, a 1,000 gallon above ground tank at the Summit Lodge fed by a 7.5 gallon per minute well, and a 500-gallon tank at the maintenance shop fed by a 25 gallon per minute well. Based on current usage, all sources are considered adequate, with the base area well more than adequate.

The Summit Lodge water supply tank experiences freezing issues on cold days which can cause disruptions in food and beverage services. There is a need to upgrade the water lines to ensure consistent and reliable water availability at Summit Lodge.

See Figure II-2 for a map of the existing utilities in the base area.

3. Snowmaking Coverage

Snowmaking is an important part of Mount Sunapee's operation. The amount and timing of natural snowfall, and the degree to which temperatures are cold enough for snowmaking often dictate the overall success of a ski resort's winter operation. Compounding the weather risk is the fact that most resorts receive a significant portion of their wintertime visitation during a few, relatively short vacation periods. This factor exerts extreme pressure on resorts to provide a quality snow product during those important holiday periods.

Mount Sunapee currently holds permitted water rights from the NH-Department of Environmental Services allowing for the winter seasonal use of water from Lake Sunapee annually. This water provides snowmaking coverage on approximately 207 acres of developed ski terrain. Over the past five seasons, the resort has averaged using 151.5 million gallons of water per year. Approximately 28 inches of man-made snow coverage is required to ski the terrain covered by the snowmaking infrastructure. See Figure III-4 for a snowmaking coverage map.

E. Existing Guest Services Facilities

1. Space Use Analysis

Skier services are offered in four primary locations within the base area of Mount Sunapee:

- The Spruce Lodge, constructed in 1962, and is in good condition. The lodge is approximately 26,300 square feet in size, and houses a restaurant, 635 indoor and 200 outdoor seats, a bar/lounge, restrooms, guest service facilities, ski school, rentals, retail sales, ticket sales, public lockers, administration and storage.[3] Adjacent to the Spruce Lodge is the Ski Patrol building, housing First Aid/Ski Patrol as well as the Ski School and Ambassador locker rooms.

- The Sunapee Lodge, located at the west end of parking lot #1, was constructed in 1999. The lodge is approximately 24,800 square feet, and houses a restaurant with 590 indoor seats, ticket sales, public lockers, retail sales, restrooms, administration, and storage.

- The Learning Center, a 5,300-square foot building constructed in 2003 as the primary location for children's ski school programs and daycare.

- The Alpine Racing Competition Center, a 1,849-square foot building constructed in 2004 and expanded with a 1,554-square foot addition in 2013. The Center is the primary location for the participants in the Mount Sunapee Alpine Racing Program.

On-mountain services are provided in the Summit Lodge. The 6,275-square foot building was constructed in 1963, The lodge houses food service and restrooms, and has 191 indoor seats.

[3] For the purposes of this discussion, Spruce Lodge includes the adjacent rental shop.

Space Use Planning

To provide a balanced resort experience, sufficient guest service space should be provided to accommodate the existing resort CCC. The distribution of the CCC is utilized to determine guest service capacities and space requirements at base area and on-mountain facilities. The CCC should be distributed between each guest service facility location according to the number of guests that would be utilizing the lifts and terrain associated with each facility.

Service functions include:

Restaurant Seating: All areas designated for food service seating, including restaurants, cafeterias, and brown bag areas. Major circulation aisles through seating areas are designated as circulation/waste, not seating space.

Kitchen/Scramble: Includes all food preparation, food service, and food storage.

Bar/Lounge: All serving and seating areas designated as restricted use for the serving and consumption of alcoholic beverages. If used for food service, seats are included in seat counts.

Restrooms: All space associated with restroom facilities (separate women, men, and employees).

Guest Services: Services including resort information desks, kiosks, and lost and found.

Adult Ski School: Includes ski school booking area and any indoor staging areas. Storage directly associated with ski school is included in this total.

Kid's Ski School: Includes all daycare/nursery facilities, including booking areas and lunchrooms associated with ski school functions. Storage and employee lockers directly associated with ski school are included.

Rentals/Repair: All rental shop, repair services, and associated storage areas.

Retail Sales: All retail shops and associated storage areas.

Ticket Sales: All ticketing and season pass sales areas and associated office space.

Public Lockers: All public locker rooms. Any public lockers located along the walls of circulation space are included, as well as the 2 feet directly in front of the locker doors.

Ski Patrol/First Aid: All first aid facilities, including clinic space. Storage and employee lockers directly associated with ski patrol are included in this total.

Administration/Employee Lockers & Lounge/Storage: All administration/ employee/storage space not included in any of the above functions.

Enough space should be provided to accommodate the existing resort CCC of 4,820 guests per day. Table 7 shows the size and placement of all existing visitor services at Mount Sunapee. Based upon a CCC of 4,820, Table 8 compares the current space use allocations of the visitor service functions to industry standards for a resort of similar size and market orientation as Mount Sunapee.

Table 7. Space Use Analysis—Resort Total – Existing Conditions

Service Function	Existing Total (sq. ft.)	Recommended Range (sq. ft.)	
		Low	High
Ticket Sales/Guest Services	3,250	1,950	2,390
Public Lockers	580	3,250	3,980
Rentals/Repair	2,825	3,900	5,210
Retail Sales	2,447	2,730	3,340
Bar/lounge	1,340	3,420	4,180
Ski School	2,927	1,740	2,120
Daycare/Nursery	1,000	3,470	4,240
Restaurant Seating	20,497	13,970	17,080
Kitchen/Scramble	5,875	4,190	5,120
Rest rooms	3,035	3,140	3,840
Ski Patrol	2,100	1,570	1,920
Administration	3,888	2,280	2,780
Employee Lockers/Lounge	1,320	1,140	1,390
Mechanical	1,748	1,260	1,900
Storage	4,412	2,100	3,170
Circulation/Waste	9,775	5,050	7,600
TOTAL SQUARE FEET	**67,019**	**55,160**	**70,260**

Notes:
Spruce Lodge includes Rentals building
Rentals represent 20% of existing CCC for skis and 7% for boards (880 skis and 330 boards, PLUS 140 skis and 42 boards in the Learning Center).
Equipment used by cell tower operation stored in Storage/Mechanical space (approx. 1,200 square feet) in the Summit Lodge is not included in this analysis.

F. Food Service Seating

Food service seating at Mount Sunapee is provided at the base area in the Spruce Lodge and Sunapee Lodge, and on-mountain at the Summit Lodge. There is a total of 1,416 seats available to skiers.

A key factor in evaluating restaurant capacity is the turnover rate of the seats. A turnover rate of three to five times is the standard range utilized in determining restaurant capacity. Sit-down dining at ski areas typically results in a turnover rate of three, while "fast food" cafeteria style dining is characterized by a higher turnover rate. Furthermore, weather has an influence on turnover rates at ski areas, as on very cold or snowy days skiers will spend more time indoors than on mild, sunny days. Due to frequent cold and inclement weather, an average turnover rate of 3 was used for the Base Area and 3.5 at the Summit Lodge.

The following table summarizes the seating requirements at Mount Sunapee, based on a logical distribution of the CCC to each service building/location.

Table 8. Existing Food Service Seating Recommendations (square feet)

	Base Area	Summit	Total
Lunchtime Capacity (CCC + 5% non-skiing guests)	3,881	1,180	5,061
Average Seat Turnover	3	3.5	
Existing Seats	1,225	191	1,416
Required Seats	1,294	337	1,631
Difference	-69	-146	-215
Existing Seating Capacity	3,675	669	4,344

Notes:
Counts include indoor seating only. There are approx. 200 outdoor seats at Spruce Lodge and 56 and Summit Lodge.
Base area seats = 635 at Spruce Lodge and 590 seats at Sunapee Lodge.

There is a deficiency in seating capacity of 215 seats. The seating shortage is somewhat mitigated by the children's lunches provided in the Learning Center, and by the fact that outdoor deck seating is available at the Spruce Lodge and the Summit Lodge. However, as the ski area is upgraded, additional food service seating should be provided.

G. Parking and Roads

Total parking capacity must be balanced with the CCC. All skiers come to Mount Sunapee in cars or buses and park in the day-skier parking areas. No overnight accommodations are available at Mount Sunapee. Three parking areas exist in the base area. Lots #1 and #2 are paved, and Lot #3 is gravel.

Table 9. Existing Parking Recommendations

Building/Location	Multiplier	Base Area	Total
CCC plus non-ski guests	5%		5,061
Percent parking at portal		100%	
Number parking at portal		5,061	5,061
Net number requiring parking		**5,061**	**5,061**
Number of guests arriving by car	95%	4,808	4,808
Number of guests arriving by charter bus	5%	253	253
Required car parking spaces	2.70	1,781	1,781
Required charter bus parking spaces	35	7.2	7
Equivalent car spaces (1 bus=4.5 car)	4.5	32.5	32.5
Required employee car parking spaces	4%	193	193
Total required spaces		2,006	2,006
Existing parking spaces		2,130	2,130
Surplus/Deficit		124	124

Notes:
Assumes increase in bus business from 7 to 12 buses on busy days.
Existing parking: Lot 1 = 545 cars, Lot 2 = 510 cars, Lot 3 = 775 cars, Beach = 300 cars

Based upon a CCC of 4,820 skiers, there is currently a surplus of day-skier parking. This surplus is due to the inclusion of the State Beach parking spaces, which are used on busy days as overflow parking for guests and employees. Due to the long walking distance, Mount Sunapee runs a shuttle service from the State Beach (when it is in use) and Lot 3 to Sunapee Lodge. As the mountain capacity increases additional and more proximate parking would need to be provided.

H. Summer Adventure Park

The following summer activities are currently offered at the Adventure Park. The activities are designed to appeal to a broad cross-section of guests with recreational activities for all age groups, skill sets and price points. The existing activities were developed with great care to preserve the essential character of Mount Sunapee. Both the type of activities and their locations were carefully considered to fit into the existing Mount Sunapee operations and to appeal to guests.

The Base Area Existing Conditions map (Figure II-3) shows the location of the Adventure Park activities.

Canopy Zip Line Tour: The Canopy Zip Line Tour (CZLT) is in the woods at the South Peak area. There are eight (8) different zip line stages and other features such as aerial bridges and rappels from a high tree platform to a lower tree platform. The final stage ends behind the Adventure Park Welcome Center Building with a rappel from the final aerial platform down to ground level. Guests are encouraged to make reservations for a specific day and time for their canopy tour experience due to the low daily capacity.

Aerial Challenge Course: The Aerial Challenge Course (ACC) is in the woods at South Peak adjacent to the base terminal of the Clipper Ship Quad chairlift. The ACC is a ropes challenge course featuring four (4) layouts of differing skill levels that progress from novice to intermediate to advanced.

Mountain Bike Trails: Mount Sunapee has a network of Mountain Biking trails in the South Peak area that are designed to appeal to families. The Clipper Ship Quad chairlift has been fitted with special bike racks for transporting mountain bikes uphill to the start of the trail network. Mount Sunapee built a modular "Pump Track" for younger kids in the corner of Parking Lot 1, located in the corner of parking lot 1 near the Adventure Park. The Pump Track features are made of wood and are stored away for winter so that the full capacity of the parking lot is available for winter operations.

Disc Golf: An 18-hole Disc Golf Course has a layout that features holes that traverse ski trails and holes that are in the woods on the western side of the South Peak area. Disc Golf rental equipment is available in the Mount Sunapee Adventure Center.

Interpretive Hiking Trails: Mount Sunapee operates and assists with maintenance of a network of Interpretive Hiking Trails in collaboration with the Upper Valley Trails Alliance. Guests may hike on the Interpretive Hiking Trails free of charge, and they can enter the walking trail network at any location by foot. Guests may choose to ride uphill on the Clipper Ship Quad chairlift and start at the top of the Interpretive Trail for a small fee. Sections of the hiking trails that do not cross ski trails may become part of the snowshoe trail network in the winter. Hiking trails which cross ski trails will be closed in the winter.

Miniature Golf: Mount Sunapee operates an 18-hole Miniature Golf course at the base of the South Peak ski trails near the Clipper Ship Quad chairlift. Landscaping for the Miniature Golf Course is perennial plants complemented by three small scale model wooden replicas of the Lake Sunapee lighthouses. Man-made snow covers the course during the ski season.

Mining Sluice: Mount Sunapee operates a "Mining Sluice" from the Cold River Mining Company for children from ages 4 to 12. The children purchase small bags of mining material and use a screen box in the water sluice to find gemstones and fossils.

Climbing Wall/Gravity Jump-Air Bag: Mount Sunapee operates a Climbing Wall, located adjacent to the Aerial Challenge Course in the South Peak ski trails area.

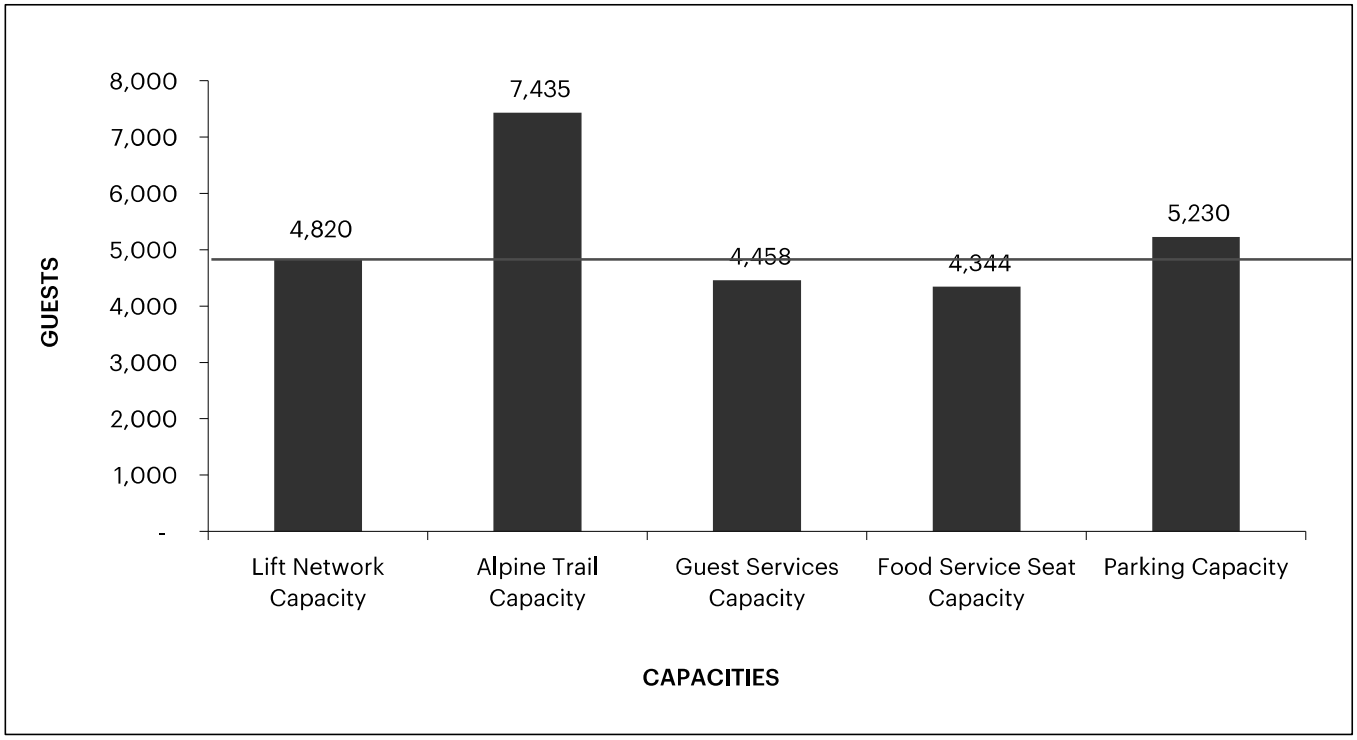
Kids Mountain Adventure Camp: Mount Sunapee offers a "Kids Mountain Adventure Camp" that operates Monday through Friday from June 24th through August 23rd. The camp is a "day camp" for children ages 5 to 12 years old. The Camp Director oversees a program of age-appropriate activities for the children which includes use of the Adventure Park as well as nature programs on the mountain.

Archery: A 3-D Archery Course operates with fifteen (15) 3-D animal targets located in a secluded area in the South Peak Adventure Park. The course was laid out in accordance with guidelines published by the National Field Archery Association.

I. Resort Balance and Limiting Factors

The overall balance of the existing ski area is evaluated by calculating the capacities of the resort's various facilities, as compared to the resort's CCC. The existing capacities are shown in Chart 2.

Chart 2. Resort Balance – Existing Conditions



Sunapee's base area and on mountain facilities are out of balance with resort's CCC. The lower food service seating capacity is reflected in longer wait times at restaurants during the busy lunchtime rush. Parking capacity seems adequate with the ability to park approximately 5,230 guests, however 750 of those guests are having to park remotely at the State beach parking area and shuttle to the mountain. On the busiest days parking is an issue even with the overflow beach lot.

CHAPTER THREE

Upgrade Plan

The Upgrade Plan for Mount Sunapee reflects the findings of the existing facilities analysis. The purpose of the plan is to produce a guide for ski area development that ensures the greatest practical and profitable use of the existing lands while remaining sensitive to the environment. The goal of the plan is to produce a high-quality experience throughout the recreational area. The Upgrade Plan is shown in Figure III-1.

A. Upgraded Lift Network

The lift upgrading plan remains similar to what was proposed in the 2014-2019 MDP. The plan calls for the installation of five new, relocated, and/or upgraded chairlifts, two new carpet conveyor lifts and a telecord surface lift.

- The existing North Peak Triple would be upgraded to a quad chairlift to increase the uphill capacity from the main base area.
- The existing Spruce Peak Triple would be upgraded to maintain the capacity of that area in the absence of the removed Duckling Double.
- A new chairlift would be installed in an alignment from the bottom area of the Sunbowl chairlift area to the top of the North Peak area and is referred to as the Cataract Triple chairlift. This would allow for improved circulation and will open new ski terrain under that lift.
- The Sunapee Express Quad chairlift would be upgraded to an Express 6-Passenger lift or a combination-lift.
- A new high-speed express chairlift would be built in what is called the West Bowl area to service the proposed new ski terrain on the western slopes of the mountain. An additional carpet lift would be built at the base of that lift for beginner skiers.

It is possible that some of the existing chairlifts that are in good condition could be reused in some of these lift alignments, such as the North Peak Triple being relocated to become the Cataract Triple.

Two lift-related projects are newly proposed in this MDP: upgrading Sunapee Express to a six-person lift (with possible gondola cabins) and a rope-tow surface lift (a telecord) to provide a more convenient connection between Parking Lot #2 and the Spruce Lodge. The remaining lift projects are previously approved.

Table 10. Lift Specifications – Upgrade Plan

Lift Name, Lift Type	Vertical Rise (ft)	Slope Length (ft)	Avg. Grade (%)	Hourly Capacity (pph)	Rope Speed (fpm)	Carrier Spacing (ft)	Lift Maker/ Year Installed
Sunbowl Quad/*DC4*	1,058	4,292	26%	2,400	1,000	100	Poma 1992/2014
Spruce Quad/*C4*	417	1,940	23%	2,400	425	43	Doppelmayr/1985
North Peak Quad/*C4*	965	3,254	31%	2,400	470	47	Old Sunbowl Quad
Sunapee Express/*DC6*	1,402	6,056	24%	3,000	1,100	132	Upgraded
Piggyback/*HT*	34	300	14%	400	200	30	Borer/1994
Clipper Ship Quad/*C4*	374	1,814	19%	1,600	425	64	Poma/2000
Boardwalk/*RT*	30	200	13%	250	100	24	Bruckschlogl/1997
Little Carpet/*C*	8	90	9%	400	50	8	Bruckschlogl/2000
Flying Carpet/*C*	48	360	17%	800	100	8	Bruckschlogl/2002
Cataract/*C3*	571	1,947	31%	1,800	450	45	Proposed
Middle Carpet/*C*	14	130	10%	800	100	8	Carpet/2011
West Bowl/DC4	*1,082*	*5,186*	*21%*	*2,400*	*1,000*	*100*	*Proposed*
West Bowl Carpet/C	*25*	*250*	*10%*	*800*	*100*	*8*	*Proposed*
Telecord/RT	*15*	*1,000*	*2%*	*600*	*150*	*15*	*Proposed*

Notes:
Upgrades to Spruce Quad and North Peak Quad, and the installation of Cataract are approved through the 2005 and 2009 MDPs but have not yet been implemented.
The two proposed lifts for West Bowl expansion were accepted in 2015.
C3 = fixed-grip triple chairlift / *C4* = fixed-grip quad chairlift
DC4 = detachable four-passenger chairlift / DC6 = detachable six-person chairlift
HT = handle-tow surface lift / *RT* = rope-tow surface lift / C = carpet

B. Upgraded Ski Terrain Network

The goal of the ski terrain upgrading program is to allow for better utilization of the existing terrain, as well as provide some new, more varied terrain. Mount Sunapee plans to construct several new trails, including new terrain in the Ridge trails area, the new Cataract run, a new intermediate trail in the South Peak learning area, a new terrain park trail, and the West Bowl terrain. This will add approximately 105 acres of additional terrain to Mount Sunapee's developed trail network (217 acres), for a total of 322 acres.[4] Additionally, lighting for night skiing is proposed on several runs in the South Peak, North Peak, and Spruce (as shown in Figure III-1).

1. Trail Widening

Proposed terrain improvements include the widening of the Williamson and Stovepipe trails, widening and extending Paradise, widening Upper and Lower Blast Off, Pipeline and Lift Line trails.

2. New Trail Development

Additional terrain includes the construction of the Upper Outer Ridge run, J Lift/Cataract run, and two new trails between Upper Ridge and Lower Blast Off (New Ridge, Upper Ridge). The Upgrade Plan also proposes a new terrain park trail between the Elliot Slope and Pipeline trail, and an additional lower intermediate trail in the South Peak area.

The new Cataract run would provide more advanced intermediate level skiing as well as providing better circulation. The new trails in the Upper and Outer Ridge area would create more intermediate level terrain and allow better utilization of the western side of the existing mountain.

The West Bowl expansion plans include a new beginner area, two new low intermediate runs, two new intermediate runs, and one new advanced intermediate level runs, for a total of approximately 56.2 acres of new skiing when all trails are built.

3. Trail Reconfiguration and Regrading

The Upgrade Plan

includes proposed regrading projects on Beck Brook, Portage, Lower Ridge and Lower Blast Off. These grading projects remove steep sections allowing the trails to be true novice ski runs, facilitating progression for beginner/novice skiers between the South Peak terrain and the more difficult summit trails.

[4] There are 17 acres of existing glades in addition to the 217 acres of developed trail network. The upgrading program adds 105 acres of proposed developed terrain. This takes the total skiable acreage from 234 acres (existing conditions) to 339 acres (upgrading program).

Table 11. Terrain Specifications – Upgrade Plan

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
Beck Brook	2,019	1,848	171	1,008	75	1.7	17%	30%	Novice
Bonanza	2,691	2,143	548	2,365	133	7.2	24%	38%	Intermediate
Byway	2,135	1,938	197	1,192	108	2.9	17%	28%	Low Intermediate
Calypso	1,542	1,374	168	945	108	2.3	18%	29%	Low Intermediate
Chase Ledges	2,147	1,685	462	2,109	107	5.2	23%	43%	Advanced Intermediate
Chipmunk	2,094	1,321	774	3,817	112	9.8	21%	29%	Low Intermediate
Coconut Grove	1,362	1,295	67	564	257	3.3	12%	17%	Novice
East Side	2,357	2,132	226	1,239	79	2.2	19%	28%	Low Intermediate
Eggbeater	1,660	1,275	385	1,911	175	7.7	21%	32%	Low Intermediate
Elliot Slope	1,672	1,260	412	2,413	116	6.4	17%	35%	Intermediate
Explorer	1,661	1,361	300	2,152	101	5.0	14%	25%	Novice
Fin	1,310	1,295	15	355	74	0.6	4%	8%	Novice
Flip Flop	1,344	1,278	67	498	221	2.5	14%	18%	Novice
Flyway	1,316	1,267	49	1,083	193	4.8	5%	10%	Low Intermediate
Fox Run	2,243	2,036	208	1,731	48	1.9	12%	27%	Low Intermediate
Goose Bumps	2,246	1,621	625	1,944	74	3.3	34%	53%	Expert

Table 11. Terrain Specifications – Upgrade Plan (cont.)

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
Guster	1,672	1,592	80	795	44	0.8	10%	13%	Low Intermediate
Hansen Chase	1,692	1,323	369	1,595	152	5.6	24%	31%	Low Intermediate
Jet Stream	1,660	1,265	395	2,115	149	7.3	19%	34%	Intermediate
Kartwheel	1,965	1,729	236	888	72	1.5	28%	39%	Intermediate
Kick Back	2,066	1,993	73	307	131	0.9	25%	27%	Low Intermediate
Lemon	1,385	1,335	50	401	121	1.1	13%	15%	Novice
Liftline	2,405	2,000	405	1,583	154	5.6	27%	35%	Intermediate
Lime	1,346	1,309	37	432	91	0.9	9%	13%	Novice
Lower Blast Off	2,038	1,322	715	3,993	93	8.6	18%	33%	Intermediate
Lower Cataract	1,866	1,666	200	903	105	2.2	23%	36%	Intermediate
Lower Crossover	2,300	2,247	52	351	51	0.4	15%	25%	Low Intermediate
Lower Flying Goose	1,641	1,296	345	1,388	123	3.9	26%	35%	Intermediate
Lower Ridge	1,771	1,316	454	3,004	129	8.9	15%	25%	Novice
Williamson	2,472	1,673	800	5,071	100	11.7	16%	24%	Low Intermediate
Lower Wingding	1,996	1,666	331	1,735	116	4.6	20%	33%	Intermediate
Lynx	2,235	1,306	929	3,151	134	9.7	31%	47%	Advanced Intermediate

Table 11. Terrain Specifications – Upgrade Plan (cont.)

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
Middle Wingding	2,360	1,996	363	1,462	176	5.9	26%	40%	Intermediate
Old Goat	2,656	2,608	48	359	37	0.3	14%	25%	Low Intermediate
Outer Ridge	2,206	1,642	564	3,753	115	9.9	15%	31%	Low Intermediate
Paradise	1,647	1,485	162	1,195	99	2.7	14%	19%	Novice
Pipeline	1,679	1,260	420	2,108	176	8.5	20%	31%	Low Intermediate
Porky's	2,711	2,633	78	556	48	0.6	14%	36%	Intermediate
Portage	1,624	1,525	99	543	82	1.0	19%	26%	Novice
Promenade	1,334	1,292	43	327	377	2.8	13%	17%	Novice
Promenade Carpet	1,295	1,323	28	168	120	1.5	10%	10%	Beginner
Province	1,661	1,298	363	2,286	122	6.4	16%	28%	Novice
Skyway Ledges	2,690	2,493	197	1,006	80	1.9	20%	37%	Intermediate
Skyway	2,621	2,078	543	2,250	124	6.4	25%	37%	Intermediate
Smooth Sail'n	1,425	1,295	130	930	118	2.5	14%	22%	Novice
Spinnaker	1,598	1,382	215	823	49	0.9	27%	36%	Intermediate
Sundance	2,015	1,866	149	794	107	1.9	19%	29%	Low Intermediate
Sunnyside Down	1,391	1,353	38	396	55	0.5	10%	18%	Novice

Table 11. Terrain Specifications – Upgrade Plan (cont.)

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
Sunrise Glade	0	0	0	0	0	0.0	0%	0%	Expert
Toboggan Chute	2,233	2,048	185	1,660	56	2.1	11%	21%	Novice
Upper Blast Off	2,657	2,038	619	2,486	97	5.5	26%	38%	Advanced Intermediate
Upper Cataract	2,199	1,861	338	1,235	118	3.3	29%	39%	Advanced Intermediate
Upper Crossover	2,472	2,426	46	480	37	0.4	10%	11%	Low Intermediate
Upper Flying Goose	2,242	1,641	601	1,815	140	5.8	35%	43%	Advanced Intermediate
Upper Hansen Chase	2,245	2,091	153	793	90	1.6	20%	31%	Advanced Intermediate
Upper Ridge	2,711	1,771	940	5,735	110	14.4	17%	31%	Low Intermediate
Stovepipe	2,604	2,472	132	929	119	2.5	14%	27%	Low Intermediate
Upper Wingding	2,684	2,360	324	1,377	141	4.4	24%	32%	Intermediate
West Side	2,488	2,158	330	1,564	97	3.5	22%	37%	Intermediate
J Lift/Cataract Run	*2,245*	*1,669*	*576*	*2,052*	*160*	*7.5*	*29%*	*49%*	*Advanced Intermediate*
Upper Outer Ridge	*2,549*	*2,065*	*484*	*1,823*	*114*	*4.8*	*28%*	*37%*	*Intermediate*
New Ridge Trail	*2,127*	*1,590*	*537*	*2,620*	*107*	*6.5*	*21%*	*33%*	*Low Intermediate*
Paradise – Extension			*115*	*513*	*148*	*1.7*	*23%*	*45%*	*Intermediate*
New South Peak Trail			*225*	*1,221*	*149*	*4.2*	*19%*	*45%*	*Intermediate*

Table 11. Terrain Specifications – Upgrade Plan (cont.)

Trail Name	Top Elevation (ft)	Bottom Elevation (ft)	Vertical Drop (ft)	Slope Length (ft)	Avg. Width (ft)	Slope Area (acres)	Avg. Grade (%)	Max Grade (%)	Skier/Rider Ability Level
New Spruce Quad Trail			*215*	*925*	*111*	*2.4*	*24%*	*31%*	*Low Intermediate*
West Bowl 01	*1,848*	*1,462*	*386*	*3,824*	*84*	*7.3*	*10%*	*20%*	*Low Intermediate*
West Bowl 02	*2,020*	*1,485*	*535*	*3,298*	*96*	*7.3*	*17%*	*36%*	*Intermediate*
West Bowl 03	*2,215*	*1,620*	*595*	*2,816*	*113*	*7.3*	*22%*	*35%*	*Advanced Intermediate*
West Bowl 04	*2,345*	*1,483*	*862*	*4,568*	*125*	*13.1*	*19%*	*31%*	*Low Intermediate*
West Bowl 05	*2,529*	*1,462*	*1,067*	*6,177*	*146*	*20.7*	*18%*	*39%*	*Intermediate*
West Bowl Carpet	*1,470*	*1,460*	*25*	*275*	*218*	*0.5*	*10%*	*12%*	*Beginner*
TOTAL				120,181		321.7			

The following table and chart show the comparison of the existing distribution of terrain by skier ability level with the distribution after upgrading. These exhibits show that the upgraded trail network at Mount Sunapee would accommodate a range of skier ability levels from Beginner to Expert.

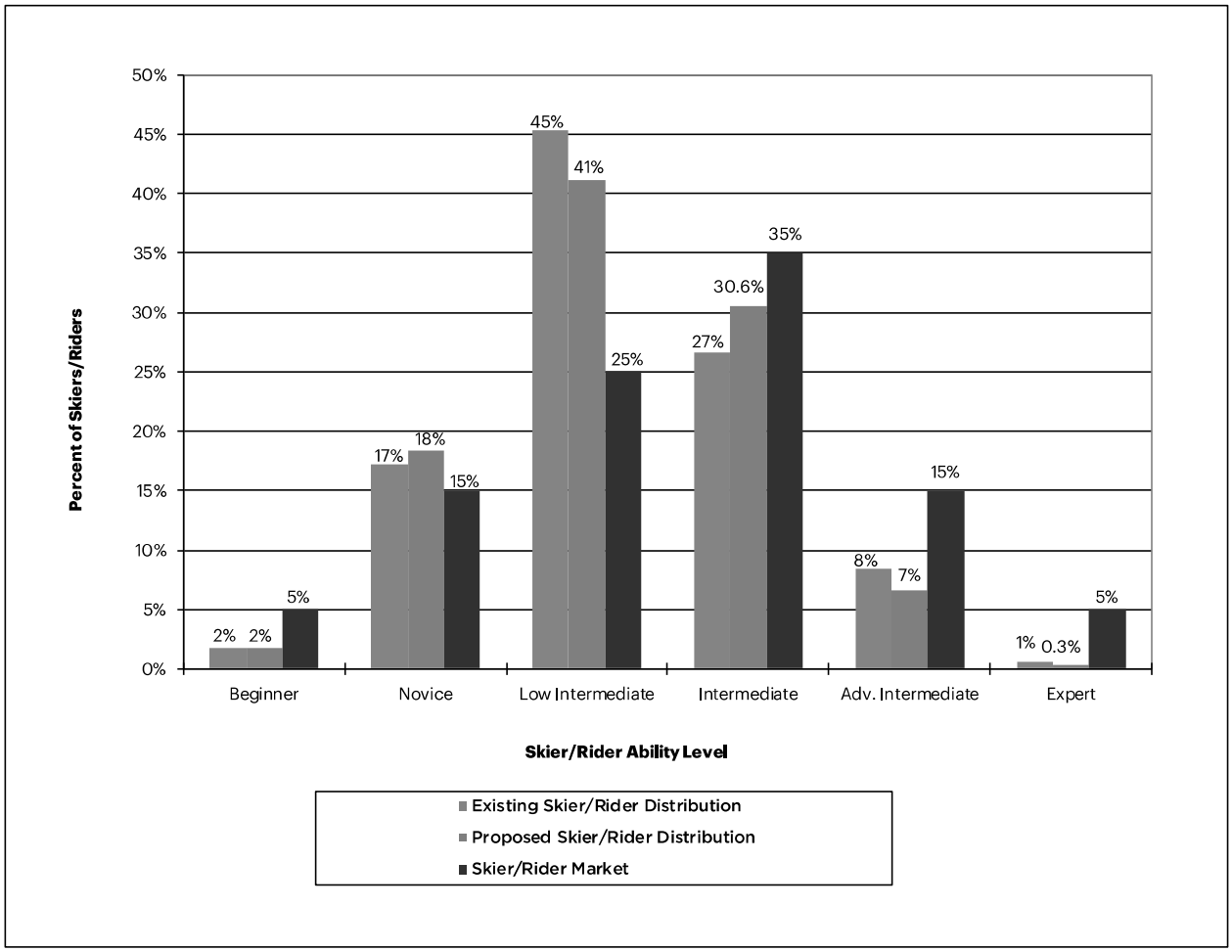
The terrain distribution figures indicate a shortage of Beginner, Novice, Intermediate, Advanced Intermediate, and Expert terrain, and a surplus of Low Intermediate terrain. Again, this surplus of Low Intermediate terrain is a positive attribute for Mount Sunapee and is indicative of the resort's target market and market position as a family-oriented area.

With the addition of the proposed Intermediate and Advanced Intermediate terrain, the distribution figures indicate a slightly closer match between the type of terrain being offered by the Upgrade Plan and the ability level profile of the region's skier market. This will provide for a better-balanced resort. The deficit of Expert level terrain continues to be mitigated by the existing gladed areas, and the new lower level fits with Mount Sunapee's family-oriented market position.

Table 12. Terrain Distribution by Ability Level – Upgrade Plan

Skier/Rider Ability Level	Trail Area (acres)	Skier/Rider Capacity (guests)	Skier/Rider Distribution (%)	Skier/Rider Market (%)
Beginner	2.0	60	2%	5%
Novice	42.3	635	18%	15%
Low Intermediate	118.5	1,422	41%	25%
Intermediate	109.6	1,096	31%	35%
Advanced Intermediate	46.0	230	7%	15%
Expert	3.3	10	0.3%	5%
TOTAL	**321.7**	**3,452**	**99%**	**100%**

Chart 3. Terrain Distribution by Ability Level – Upgrade Plan



C. Upgraded Capacity Analysis

1. Comfortable Carrying Capacity

The upgrading program for Mount Sunapee increases the CCC of the lift and trail network at Mount Sunapee to about 6,850 guests per day.

Table 13. Comfortable Carrying Capacity – Upgrade Plan

Lift Name, Lift Type	Slope Length (ft)	Vertical Rise (ft)	Hourly Capacity (pph)	Oper. Hours (hrs)	Access Role (%)	Misload Stopping (%)	Adjusted Hourly Capacity (pers/hr)	VTF/Day (000)	Vertical Demand (ft/day)	CCC (guests)
Sunbowl Quad/*DC4*	4,292	1,058	2,400	7.00	10	5	2,040	15,108	13,467	1,120
Spruce Quad/*C4*	1,940	417	2,400	7.00	0	10	2,160	6,305	8,396	750
North Peak Quad/*C4*	3,254	965	2,400	7.00	10	10	1,920	12,970	14,421	900
Sunapee Express/*DC6*	6,056	1,402	3,000	7.00	20	5	2,250	22,082	18,034	1,220
Piggyback/*HT*	300	34	400	7.00	0	20	320	76	850	90
Clipper Ship Quad/*C4*	1,814	374	1,600	7.00	0	10	1,440	3,770	5,066	740
Boardwalk/*RT*	200	30	250	7.00	0	20	200	42	1,475	30
Little Carpet/*C*	90	8	400	7.00	0	20	320	18	310	60
Flying Carpet/*C*	360	48	800	7.00	0	20	640	215	1,254	170
Cataract/*C3*	1,947	571	1,800	7.00	10	10	1,440	5,756	13,377	430
Middle Carpet/*C*	130	14	800	7.00	0	20	640	63	690	90
West Bowl/*DC4*	5,186	1,082	2,400	7.00	10	5	2,040	15,451	13,647	1,130
West Bowl Carpet/*C*	250	25	800	7.00	0	20	640	112	909	120
Telecord	1,000	15	600	7.00	100	0	-	0	256	-
TOTAL	**26,819**		**20,050**				**16,050**	**81,968**		**6,850**

Notes:
C3 = fixed-grip triple chairlift / *C4* = fixed-grip quad chairlift
DC4 = detachable four-passenger chairlift / DC6 = detachable six-person chairlift
HT = handle-tow surface lift / *RT* = rope-tow surface lift / C = carpet

2. Density Analysis

The existing densities at Mount Sunapee are at desirable levels. Since significant increases in skier density would decrease the quality of the skiing experience, it is a goal to balance increases in lift capacity with commensurate increases in terrain capacity. The density analysis for the Upgrade Plan at Mount Sunapee is illustrated in Table 14. The last line of the table shows that this goal would be accomplished, with densities remaining at desirable levels.

Table 14. Density Analysis – Upgrade Plan

Lift Name, Lift Type	CCC	Guest Dispersement			Density Analysis					Density Index (%)
		Support Facility/Milling (guests)	Lift Lines (guests)	On Lift (guests)	On Terrain (guests)	Terrain Area (acres)	Terrain Density (guests/ac)	Target Trail Density (guests/ac)	Diff. (+/-)	
Sunbowl Quad/*DC4*	1,120	280	218	146	476	59.5	8	10	-2	80%
Spruce Quad/*C4*	750	188	180	164	218	29.7	7	11	-4	64%
North Peak Quad/*C4*	900	225	256	222	197	27.2	7	9	-2	78%
Sunapee Express/*DC6*	1,220	305	150	206	559	102.1	5	11	-6	45%
Piggyback/*HT*	90	23	37	8	22	1.3	16	15	1	107%
Clipper Ship Quad/*C4*	740	185	163	102	290	29.4	10	14	-4	74%
Boardwalk/*RT*	30	8	7	7	8	1.0	8	27	-19	30%
Little Carpet/*C*	60	15	21	10	14	0.8	19	30	-11	63%
Flying Carpet/*C*	170	43	43	38	46	4.4	10	15	-5	67%
Cataract/*C3*	430	108	120	104	98	8.7	11	6	5	183%
Middle Carpet/*C*	90	23	32	14	21	1.4	15	15	0	100%
West Bowl/*DC4*	1,130	283	282	176	389	55.7	7	10	-3	70%
West Bowl Carpet/*C*	120	48	32	27	13	0.5	26	30	-4	87%
TOTAL	**6,850**	**1,734**	**1,541**	**1,224**	**2,351**	**321.7**	**8**	**11**	**-3**	**73%**

Notes:
C3 = fixed-grip triple chairlift / *C4* = fixed-grip quad chairlift
DC4 = detachable four-passenger chairlift / DC6 = detachable six-person chairlift
HT = handle-tow surface lift / *RT* = rope-tow surface lift / C = carpet

D. Maintenance Facilities, Utilities, and Snowmaking Coverage

1. Maintenance Facilities

The resort's maintenance facilities have been renovated since the last MDP and continue to be renovated and possibly expanded as part of on-going maintenance activities. No new maintenance facilities are proposed to be built as a part of this master plan.

2. Utilities

Upgrades to the sewer system include expanding the spray field lines and installing a sewer system for the West Bowl facility.

The new lifts and lift upgrades will require service upgrades in Mount Sunapee's power supply. The existing single phase, 220v service on the Bowl Road will need to be upgraded to 480volt, 3-phase service.

The addition of the West Bowl facility will require installing the water supply to that area. No other upgrades to the resort's water supply system are proposed at this time.

Upgrades to the Summit Area include an extension of existing water lines to reduce the likelihood of freezing and subsequent water-supply interruptions.

3. Snowmaking Coverage

Expansion of the resort's snowmaking system is an important part of the Upgrade Plan. Ensuring a reliable and quality skiing product on the proposed trails is critical to the reputation and development of the resort. In conjunction with the terrain modifications, the installation of snowmaking infrastructure on the proposed ski trails would add approximately 123 additional acres of snowmaking coverage.

Mount Sunapee's currently permitted water rights from the NH-Department of Environmental Services to use water from Lake Sunapee for winter snowmaking operations are sufficient to accommodate the proposed increases in snowmaking coverage for the additional ski trails that are proposed in this MDP.

Both existing and expanded coverage is illustrated on the Snowmaking Plan (Figure III-4).

E. Upgraded Guest Services Facilities

Improved and expanded skier services would be offered at Mount Sunapee upon completion of the upgrading program, accommodating the upgraded resort CCC of 6,850 guests per day. Base area improvements include:

- Renovate and expand Sunapee Lodge
- Renovate and expand the Spruce Lodge
- Renovate and expand the Summit Lodge
- Construct new parking lot #4
- Construct a new base lodge facility with basic skier services in the West Bowl
- Construct a new parking lot in the West Bowl.

This MDP is proposing the addition of three new guest service improvements, two to be located at the base of South Peak and one at Sunapee Lodge. These include:

- Installing a warming yurt
- Renovating Ray's House and the existing Warming Hut
- Grading the Base Area around Sunapee Lodge to improve wedding & special event access.

1. Space Use Analysis

Based upon the upgraded CCC of 6,850 skiers, Tables 15 and 16 compare the current space use allocations of the visitor service functions to industry standards for a resort of similar size and market orientation as Mount Sunapee.

Existing deficits would be addressed in the proposed expansions of the Sunapee and Summit lodges, and in the proposed new base lodge facility in the West Bowl area. Improvements at Summit Lodge would allow for enhanced food and beverage offerings for visitors throughout the year.

Table 15. Space Use Analysis—Main Base Area Total – Upgrade Plan

Service Function	Existing Total (sq. ft.)	Recommended Range (sq. ft.)	
		Low	High
Ticket Sales/Guest Services	3,250	2,360	2,880
Public Lockers	580	3,930	4,800
Rentals/Repair	2,825	5,550	7,400
Retail Sales	3,540	3,180	3,890
Bar/lounge	1,340	4,820	5,900
Ski School	2,087	2,220	2,710
Daycare/Nursery	1,000	4,930	6,030
Restaurant Seating	19,404	21,390	26,150
Kitchen/Scramble	5,875	6,420	7,840
Rest rooms	3,035	4,810	5,880
Ski Patrol	1,510	2,410	2,940
Administration	3,888	3,240	3,960
Employee Lockers/Lounge	2,840	1,620	1,980
Mechanical	1,748	1,810	2,720
Storage	4,412	3,010	4,530
Circulation/Waste	9,775	7,220	10,870
TOTAL SQUARE FEET	**67,109**	**78,920**	**100,480**

Table 16. Space Use Analysis—West Bowl Base Area Total – Upgrade Plan

Service Function	Recommended Range (sq. ft.)	
	Low	High
Ticket Sales/Guest Services	420	510
Public Lockers	690	850
Rentals/Repair	-	-
Retail Sales	680	830
Bar/lounge	-	-
Ski School	250	300
Daycare/Nursery	-	-
Restaurant Seating	4,560	5,580
Kitchen/Scramble	1,370	1,670
Rest rooms	1,030	1,250
Ski Patrol	510	630
Administration	-	-
Employee Lockers/Lounge	-	-
Mechanical	260	380
Storage	430	640
Circulation/Waste	1,030	1,530
TOTAL SQUARE FEET	**11,230**	**14,170**

2. Food Service Seating

The following table summarizes the proposed seating requirements at Mount Sunapee, based on a logical distribution of the CCC to each service building/location.

Table 17. Upgrade Plan Food Service Seating Recommendations (square feet)

	Base Area	Summit	West Bowl	Total
Lunchtime Capacity (CCC+5% non-skiing guests)	4,773	1,170	1,250	7,193
Average Seat Turnover	3	3.5	3.5	
Existing Seats	1,225	191		1,416
Required Seats	1,591	334	357	2,282
Difference	-366	-143	-357	-866
Upgrade Seating Capacity	4,773	1,170	1,250	7,193

Notes:
Counts include indoor seating only. There are approx. 200 outdoor seats at Spruce Lodge and 56 and Summit Lodge.
Base area seats = 635 at Spruce Lodge and 590 seats at Sunapee Lodge.

As shown in Table 17, given the upgraded CCC of 6,850 there is a deficiency in the existing seating capacity of 866 seats. As the ski area is upgraded, this deficit could be addressed through additional food service seating at both the Spruce and Sunapee Lodges, at the on-mountain Summit Lodge and in the new West Bowl Lodge. Additionally, seating continues to be provided within the Learning Center for program participants' lunches, and on fair weather days at the Spruce and Summit lodges' outdoor decks.

F. Parking and Roads

Total parking capacity must continue to be balanced with the CCC. To maintain this balance Lot #4 would be built in the existing base area, providing an additional 272 parking spaces. A day skier lot would be built at the West Bowl base area, with approximately 450 parking spaces. In addition, a new telecord surface lift running from Lot #3 to the Spruce Lodge would help alleviate the demands on the base area shuttle system.

Table 18. Recommended Parking – Upgrade Plan

Building/Location	Multiplier	Base Area	West Bowl	Total
CCC plus non-ski guests	5%	5,898	1,250	7,148
Percent parking at portal		100%	100%	
Number parking at portal		5,898	1,250	7,148
Net number requiring parking		5,898	1,250	7,148
Number of guests arriving by car	95%	5,603	1,188	6,791
Number of guests arriving by charter bus	5%	295	63	357
Required car parking spaces	2.70	2,075	440	2,515
Required charter bus parking spaces	35.00	8.4	1.8	10
Equivalent car spaces (1 bus=4.5 car)	4.5	37.9	8.0	46
Required employee car parking spaces	4.0%	236	25	261
Total required spaces		2,349	473	2,822
Existing parking spaces		2,130	0	2,130
Surplus/Deficit		-219	-473	-692
Proposed spaces		272	450	722
Proposed Total Spaces		**2,402**	**450**	**2,852**

Notes:
Assumes increase in bus business from 8 to 10 buses on busy days.
Existing parking: Lot 1 = 545 cars, Lot 2 = 510 cars, Lot 3 = 775 cars, Beach Lot = 300

G. Summer Adventure Park

Mount Sunapee plans to continue its summer Adventure Park improvements as an integral part of its annual operations. The existing activities were developed with great care to preserve the essential character of Mount Sunapee. That same thought process will be used in the next phases of the Adventure Park.

An Alpine Slide has been proposed since the first MDP in 2000 but has not been constructed to date. In the 2014 MDP a Mountain Coaster was proposed as an alternative to the Alpine Slide. This proposal remains pending as it was neither accepted nor denied during the 2016 revised-MDP approval process, and Mount Sunapee continues to propose installing a Mountain Coaster in this MDP.

Other proposed activities in the summer Adventure Park include the construction of additional archery lanes, summer tubing lanes, and continued development of Mountain Biking trails, as described in the 2011 Summer Recreational Program Proposal.

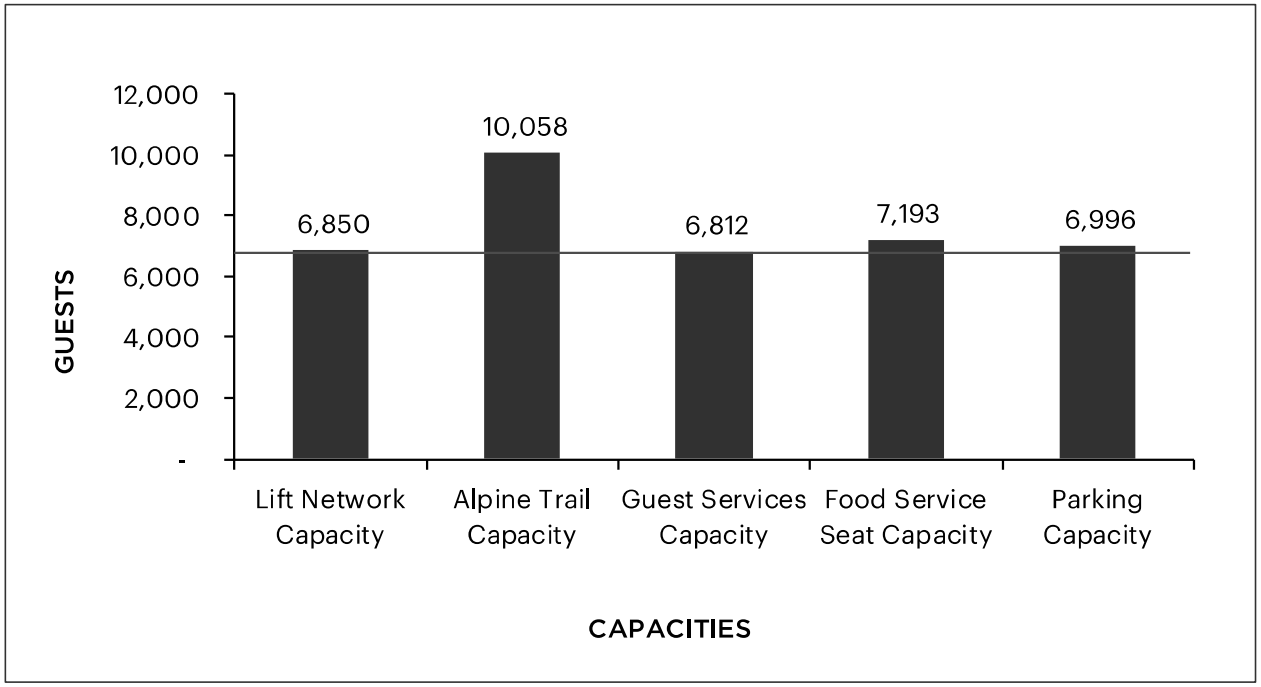
The locations of summer activities are illustrated in Figure III-5.

It is again noted that over the next five years, minor improvements to the Adventure Park or to other Mount Sunapee's facilities may be proposed in the Annual Operating Plans.

H. Resort Balance and Limiting Factors

The overall balance of the ski area is evaluated by calculating the capacities of the resort's various facilities, as compared to the resort's CCC. The above discussed capacities are shown in Chart 4.

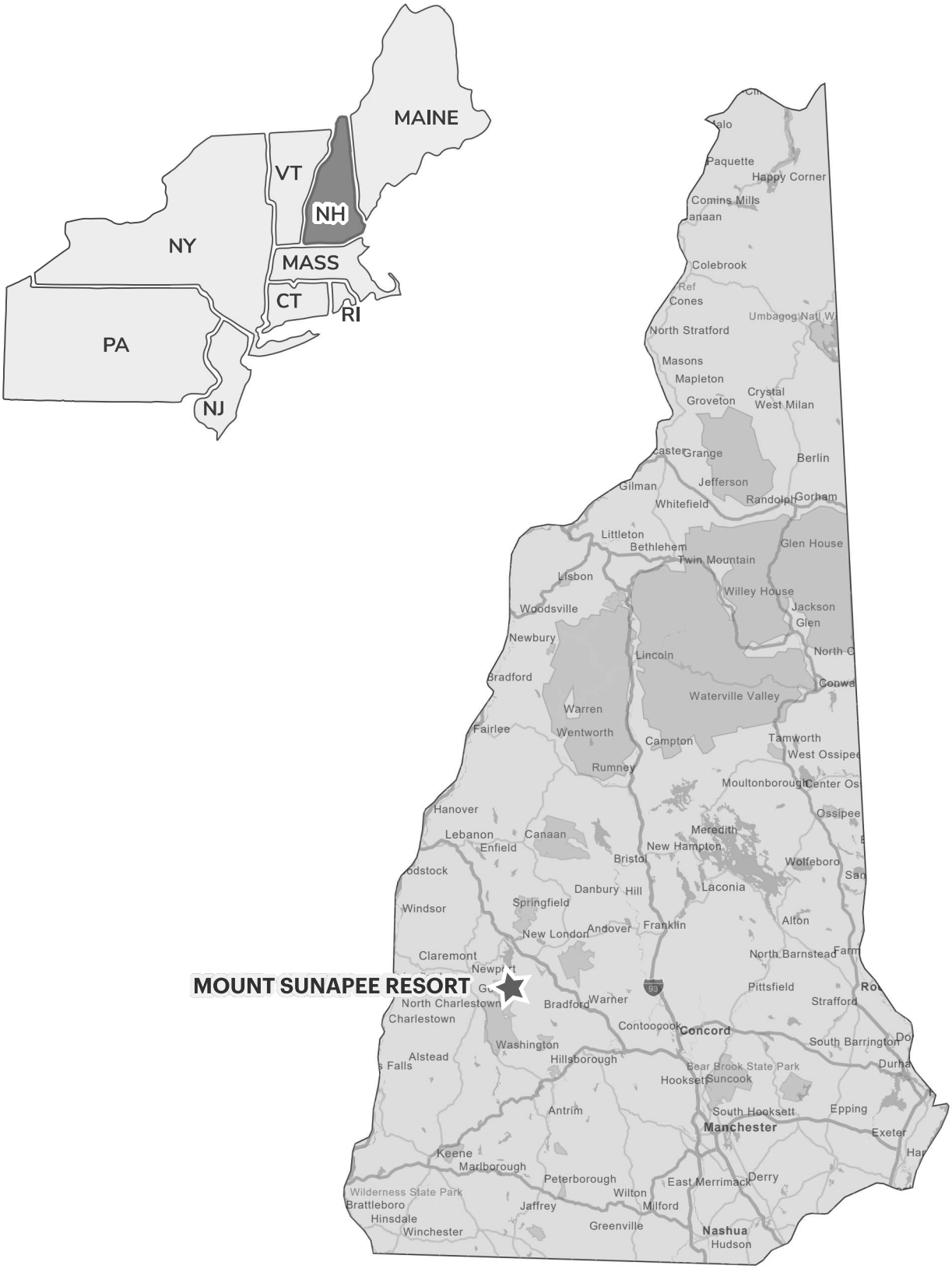
Chart 4. Resort Balance – Upgrade Plan



As the chart illustrates, skier services space, restaurant seating, and parking capacity would be improved with the upgraded CCC of the ski area, bringing the resort into overall balance. The higher capacity of the trail network is a desirable situation that results in preferable low trail densities.

Figures

Figure I-1. Location Map
Figure I-2. Slope Analysis Plan
Figure II-1. Existing Conditions Plan
Figure II-2. Existing Base Area Utilities
Figure II-3. Existing Base Area
Figure III-1. Upgrade Plan
Figure III-2. West Bowl Overall Plan
Figure III-3. Regional Map
Figure III-4. Snowmaking Plan
Figure III-5. Base Area Upgrade Plan

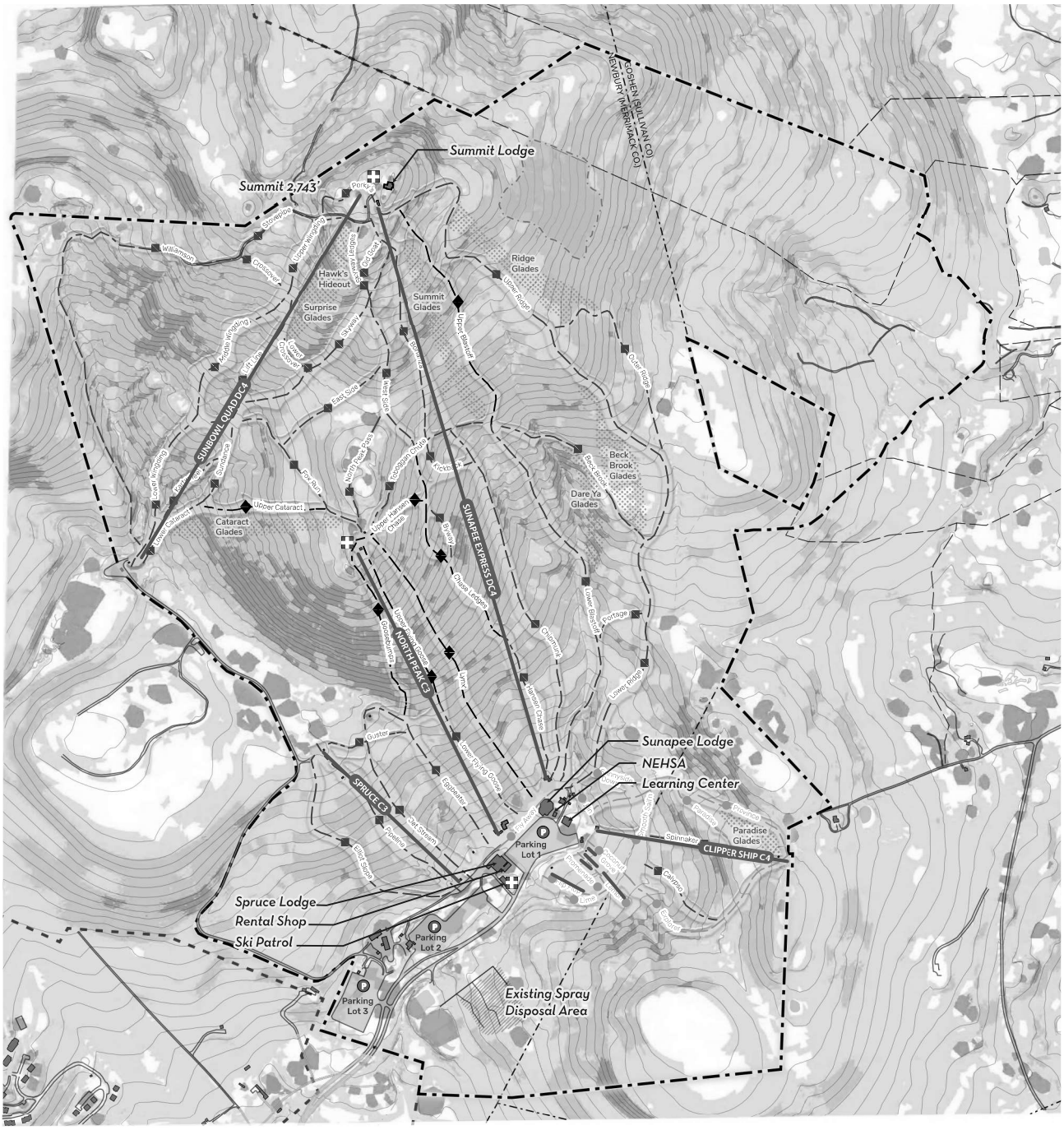


MOUNT SUNAPEE

MOUNT SUNAPEE 2020 MDP

Figure I-1. Location Map

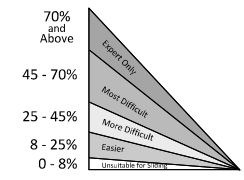
Prepared by: SE GROUP



Legend

- Existing Lifts
- Existing Ski Runs by Ability Level
- Approximate Lease Boundary
- Existing Buildings
- Polygon D
- Town Lines
- Ski Patrol
- Existing Roads
- Parking
- Park Boundary
- Other Property

Slope Legend



Contour Interval: 25'

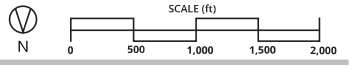


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Figure I-2. Slope Analysis Plan

Prepared by: SE GROUP

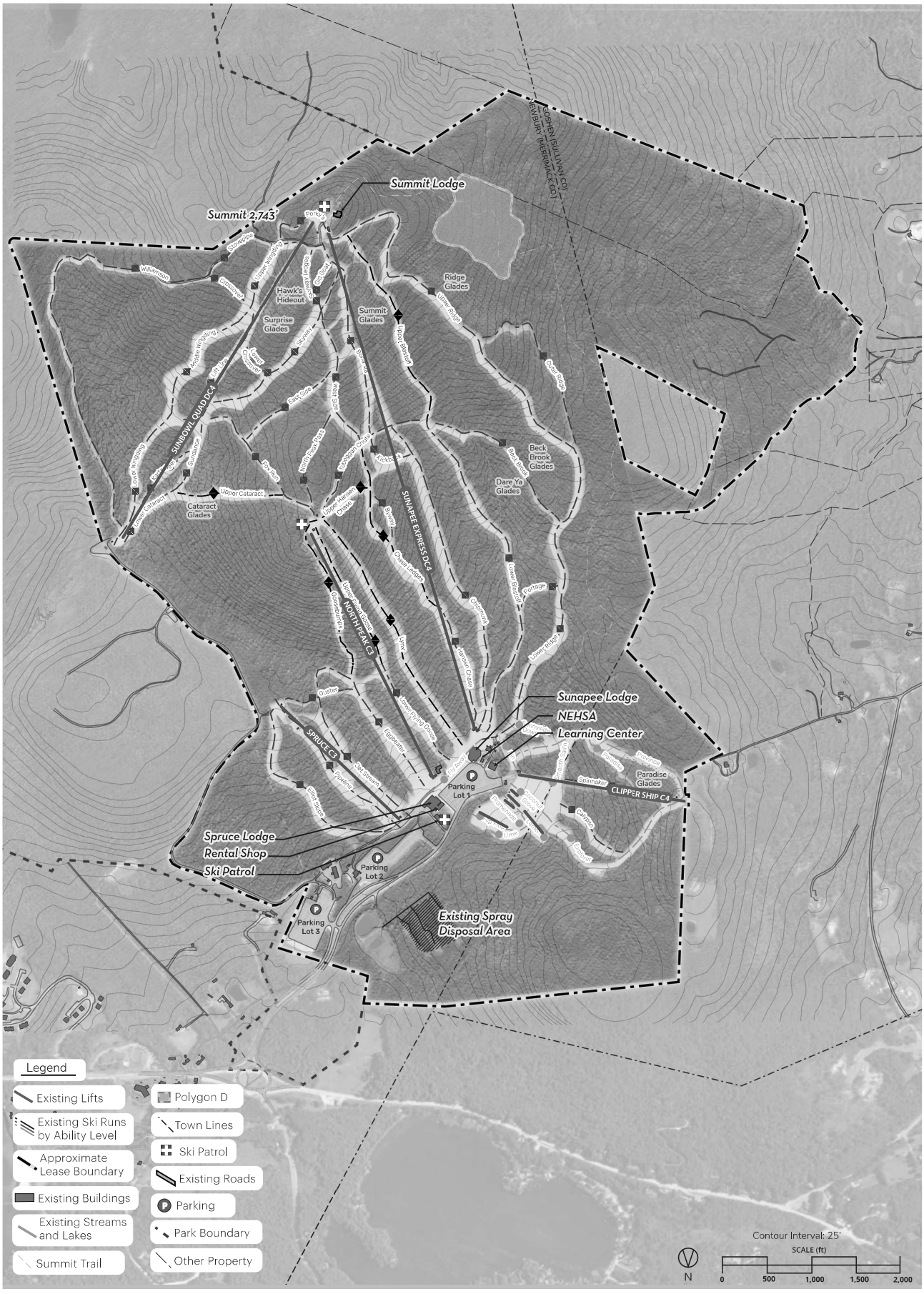

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Figure II-1. Existing Conditions Plan

Prepared by: SE GROUP

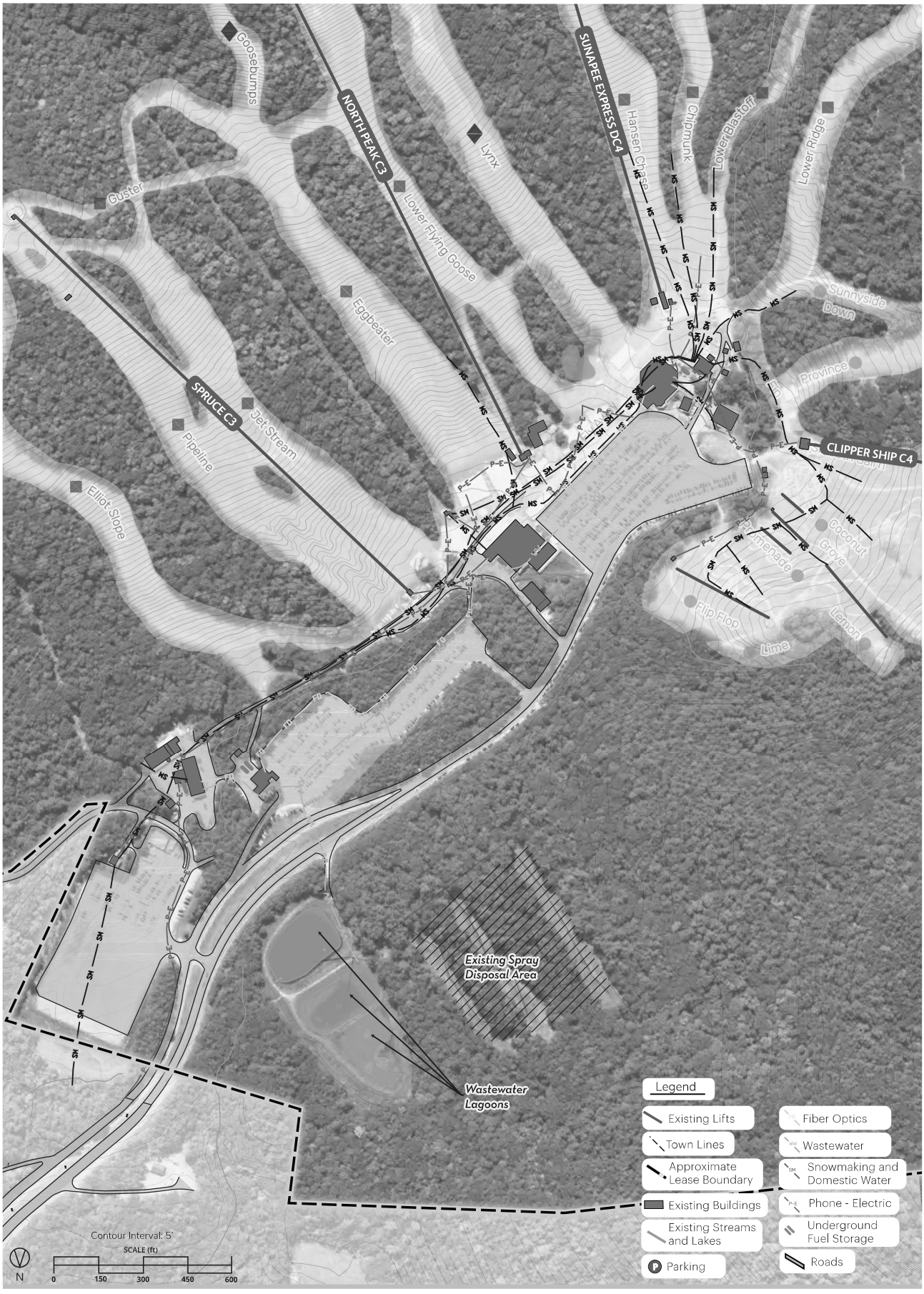

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Figure II-2. Existing Base Area Utilities

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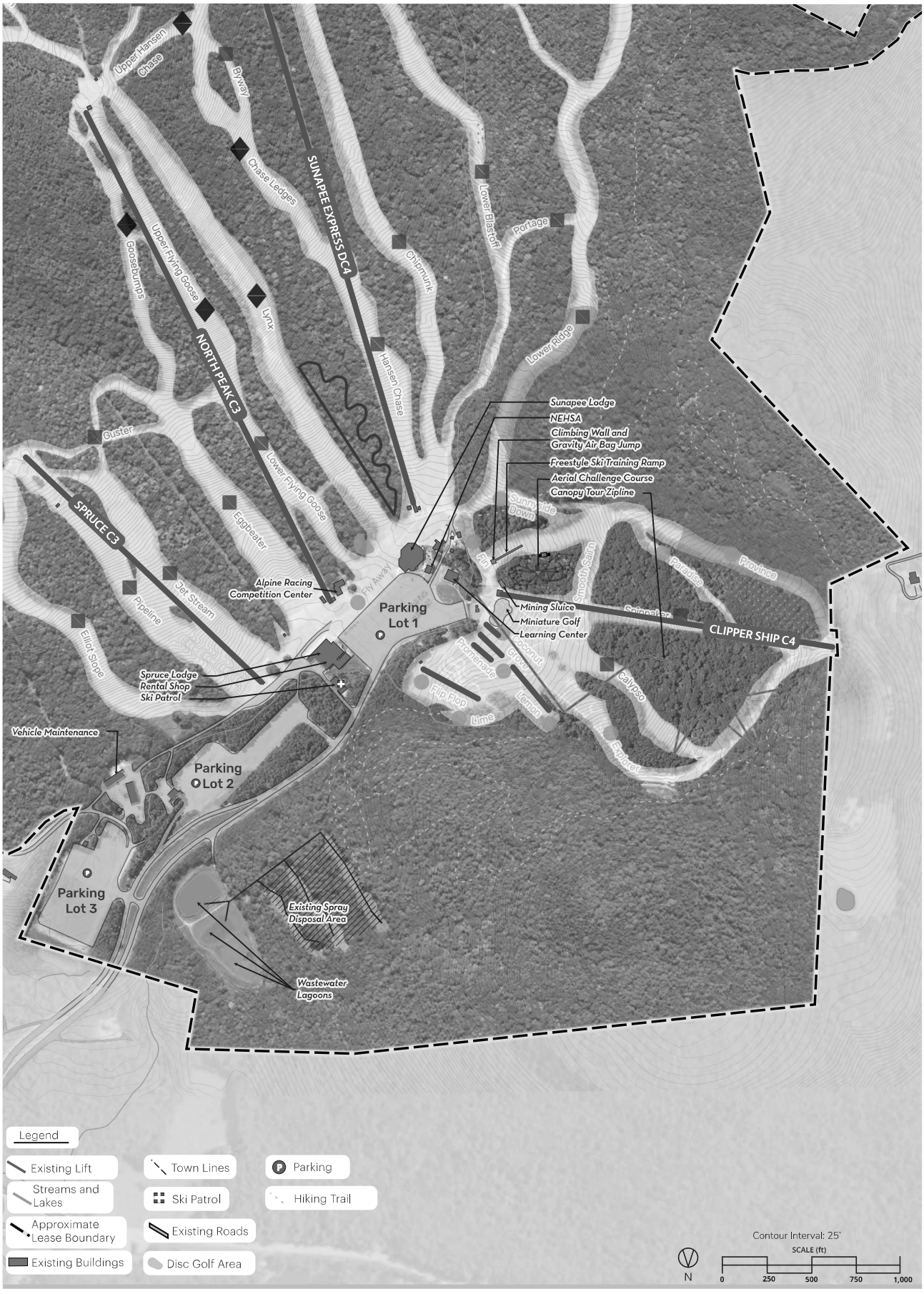

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Figure II-3. Base Area Existing Conditions

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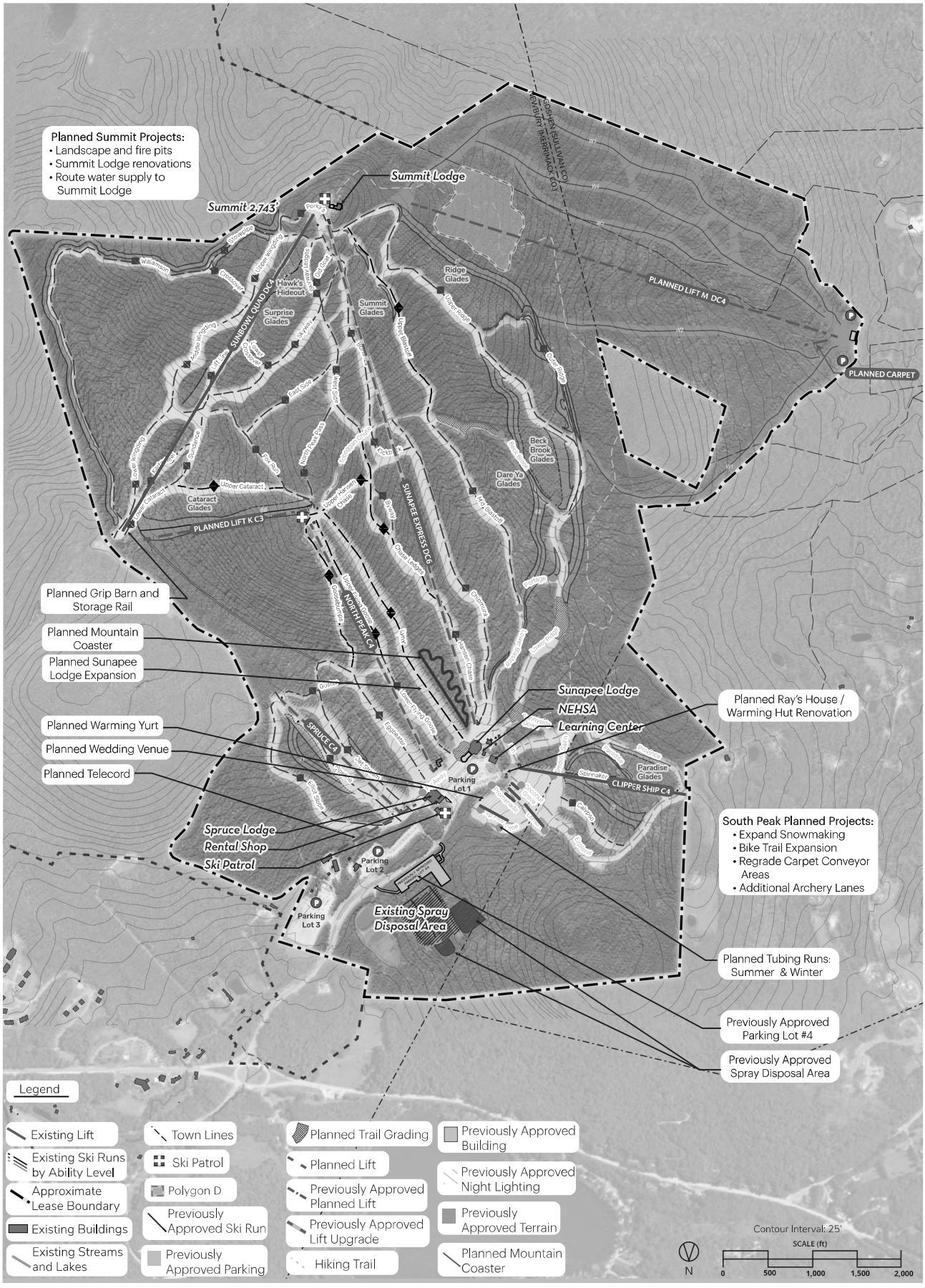
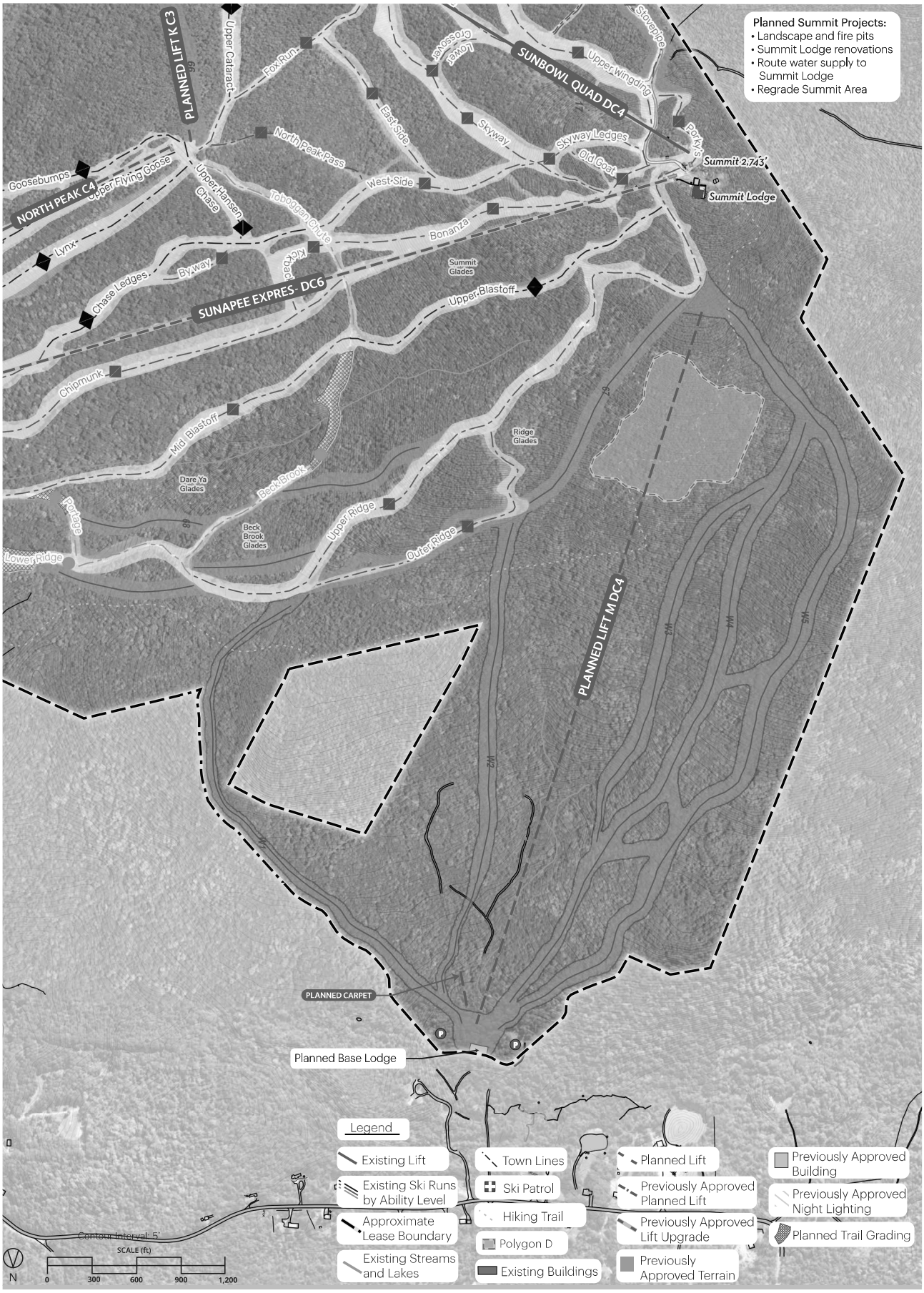


MOUNT SUNAPEE

MOUNT SUNAPEE 2020 MDP

Figure III-1. Upgrade Plan

Prepared by: SE GROUP

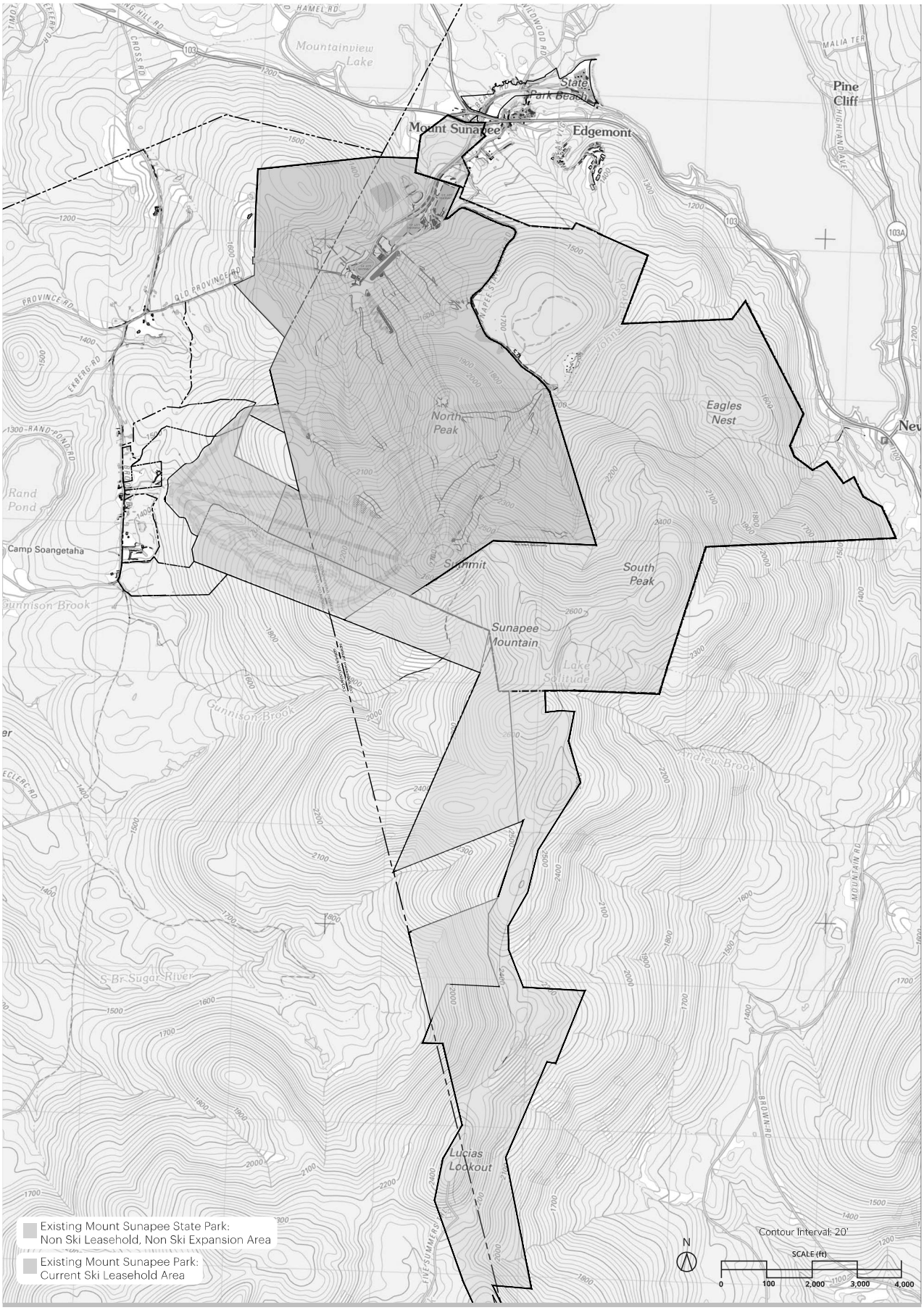


MOUNT SUNAPEE

MOUNT SUNAPEE 2020 MDP

Figure III-2. West Bowl Overall Plan

Prepared by: SE GROUP



MOUNT SUNAPEE

MOUNT SUNAPEE 2020 MDP

Figure III-3. Regional Map

Prepared by: SE GROUP

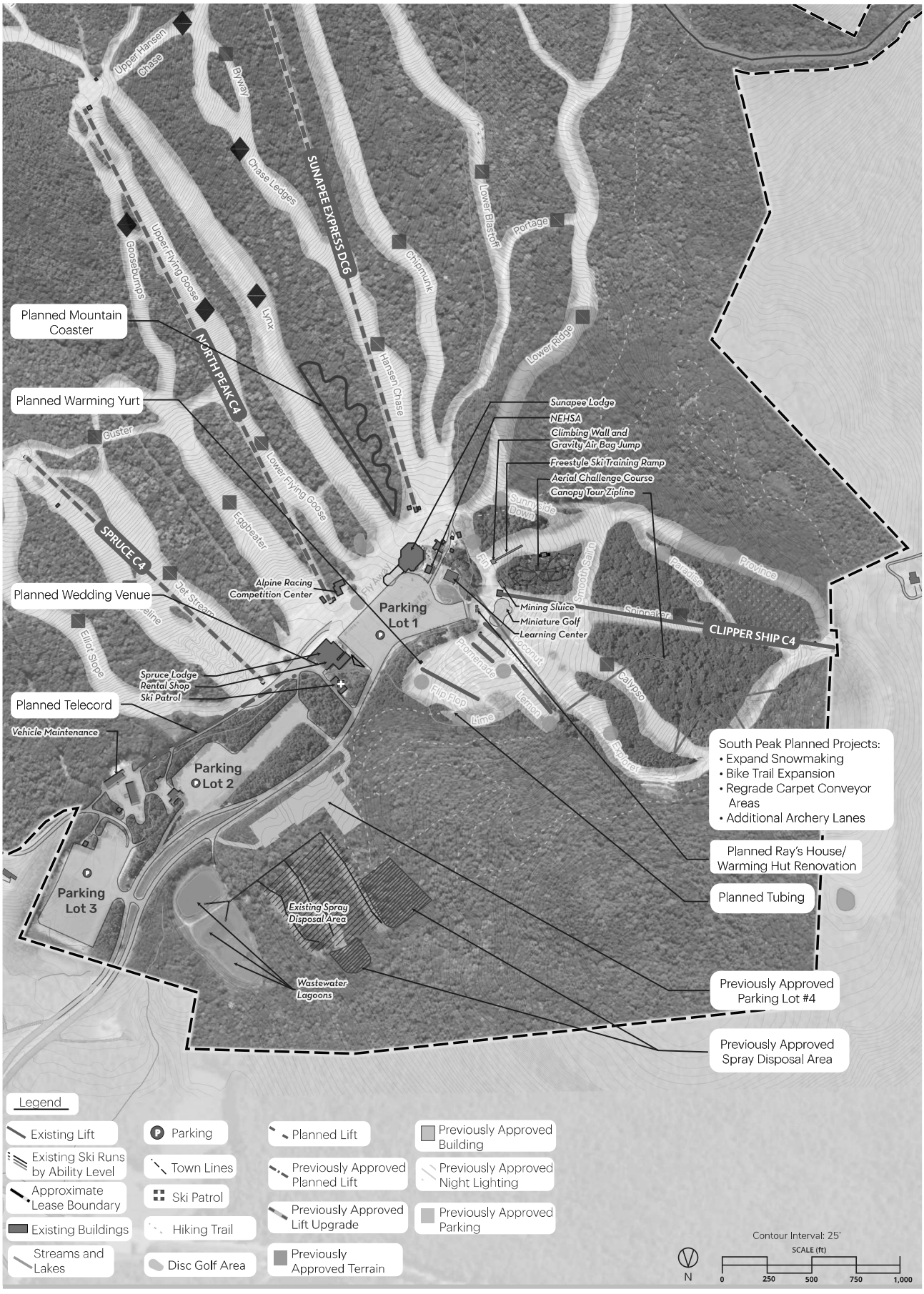


MOUNT SUNAPEE

MOUNT SUNAPEE 2020 MDP

Figure III-4. Snowmaking Plan

Prepared by: SE GROUP



MOUNT SUNAPEE

MOUNT SUNAPEE 2020 MDP

Figure III-5. Base Area Upgrade Plan

Prepared by: SE GROUP

Appendices

Appendix A. Design Criteria

Appendix B. Lease and Operating Agreements

APPENDIX A

Design Criteria

The upgrading and expansion of a ski area is influenced by a variety of ski facility design criteria that help to create a quality ski experience. This section will briefly discuss these factors as they apply to Mount Sunapee.

A. Trail Design

1. Fall Line

The Fall-Line Analysis evaluates the natural fall-lines of mountainous terrain, with the fall-line representing the path an object would take as it descends a slope under the influence of gravity. Fall-line paths indicate the natural flow of potential ski trail routes, from the top of mountain ridges to the valleys and base areas below. Consistency of fall-line provides for the best recreational skiing experience and results in the least amount of environmental disruption due to the minimal amount of terrain modification required for trail construction.

2. Slope Gradients and Terrain Breakdown

The following gradients were used to determine the skier ability level of the mountain terrain.

Table A-1. Terrain Gradients

Skier Ability	Slope Gradient
Beginner	8 to 12%
Novice	to 25%
Low Intermediate	to 35%
Intermediate	to 45%
Advanced Intermediate	to 55%
Expert	over 55%

Source: SE Group, Mountain Planning Guidelines

The distribution of terrain by skier ability level and slope gradient is then compared with the market demand for each ability level. The available ski terrain should be capable of accommodating the full range of ability levels consistent with market demand. The ideal breakdown of terrain for the Northeastern skier market is shown below, illustrating that intermediate skiers comprise the bulk of market demand.

Table A-2. Skier Ability Breakdown

Skier Ability	Percent of Skier Market
Beginner	5%
Novice	15%
Low Intermediate	25%
Intermediate	35%
Advanced Intermediate	15%
Expert	5%

Source: SE Group, Mountain Planning Guidelines

3. Trail Density

The calculation of capacity for a ski area is based in part on the acceptable number of skiers that can be accommodated on each acre of ski terrain at any one given time. The specific density criteria used for Mount Sunapee are listed in Table A-3

Table A-3. Skier Density per Acre

Skier Ability	Trail Density (skiers/acres)
Beginner	30
Novice	15
Low Intermediate	12
Intermediate	10
Advanced Intermediate	5
Expert	3

Source: SE Group

These density figures account for the skiers that are actually populating the ski trails and do not account for other guests, who are either waiting in lift lines, riding the lifts, or using the milling areas or other support facilities. These criteria assume that on an average day approximately 33% of the total number of skiers in the area will be on the trails at any one time. The densities listed above have been used in the analysis of Mount Sunapee's trail densities.

4. Trail System

Each trail must have generally consistent grades to provide an interesting and challenging experience for skiers with the ability level the trail is designed for. Optimum trail widths should vary depending upon topographic conditions and the caliber of the skier being served. The trail network must minimize cross-traffic and should provide the full range of ability levels consistent with market demand. The trails must be designed and constructed to minimize off fall-line conditions and to avoid bottlenecks and convergence zones that might produce skier congestion.

In summary, a broad range of skiing terrain must be provided in order to satisfy skiers from beginner through expert ability levels within the natural topographic characteristics of the site.

B. Lift Design

Ski lifts should be placed to serve the available ski terrain in the most efficient manner. A myriad of factors should be considered including wind conditions, round-trip skiing and access needs, interconnectability between other lifts and trails, and the need for circulatory space at the lower and upper terminal sites. The vertical rise and length of ski lifts for a mountain are the primary measures of overall attractiveness and marketability of a ski area.

C. Capacity Analysis and Design

Comfortable Carrying Capacity (CCC) is defined as an optimal level of utilization for the ski area (the number of visitors that can be accommodated at any given time) that guarantees a pleasant recreational experience, without overburdening the resort infrastructure.

The accurate estimation of the CCC of a mountain is a complex issue and is the single most important planning criterion for the resort. Related skier service facilities can be planned, including base lodge seating, mountain restaurant requirements, sanitary facilities, parking, and other skier services with proper identification of the mountain's true capacity. The CCC figure is based on a combination of the uphill hourly capacity of the lift system, the downhill capacity of the trail system, and the total amount of time spent in the lift waiting line, on the lift itself, and in the downhill descent.

D. Base Area Design

Consideration should be given to the relationship between the base area and the mountain facilities. Upon arrival at the ski area, skiers should be able to move directly from parking, through ticketing or rentals, to the base of the lifts. Walking distance and vertical differential between the base area facilities and lifts should be minimized to move skiers directly onto the mountain. Vehicle, pedestrian, and skier circulation should be coordinated to create an organized and pleasant base area environment.

E. Balance of Facilities

The mountain master planning process emphasizes the importance of balancing recreational facility development. The size of the skier service functions must be matched to the CCC of the mountain. The future development of a ski area should be designed and coordinated to maintain a balance between skier demand, ski area capacity (lifts and trails), and the supporting equipment and facilities (e.g., grooming machines, day lodge services and facilities, utility infrastructure, access, and parking).

APPENDIX B

Lease and Operating Agreements

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LEASE AND OPERATING AGREEMENT

This Lease and Operating Agreement entered into this 30th day of APRIL, 1998, by and between the **State of New Hampshire**, acting by and through its Department of Resources and Economic Development (hereinafter referred to as the "State" and "DRED," respectively) and **Okemo Mountain, Inc.,** a Vermont corporation with a principal place of business in Ludlow, Vermont, and to be qualified to do business as a foreign corporation in the State of New Hampshire (hereinafter referred to as the "Operator").

WHEREAS, since 1948 the State has operated a ski area at Mount Sunapee State Park to provide public outdoor recreational opportunities for the citizens of New Hampshire and surrounding states and provinces; and

WHEREAS, the State has developed Mount Sunapee State Park using federal outdoor recreation funding from the Land and Water Conservation Fund Program administered by the United States Department of Interior, National Park Service; and

WHEREAS, the State recognizes its continuing obligation under Section 6(f)(3) of the Land and Water Conservation Fund Act and related federal regulations and project agreements to make Mount Sunapee State Park available for public outdoor recreation use; and

WHEREAS, Land and Water Conservation Fund Program regulations allow for leasing the operation of properties acquired or developed with Land and Water Conservation Fund assistance as long as the State retains ownership and control of the property so that it continues to be used for public outdoor recreation uses; and

WHEREAS, in Chapter 119, Laws 1997, the General Court of New Hampshire authorized the Commissioner of the Department of Resources and Economic Development, in consultation with a Joint Legislative Committee, to develop and issue a request for proposal for a lease, concession agreement or management contract for the operation of the Mount Sunapee Ski Area; and

WHEREAS, it is the desire of the State and the Operator that the development of summer and winter recreational activities continue at Mount Sunapee for the mutual benefit of the public and the Operator; and

WHEREAS, following an evaluation and selection process, the Joint Legislative Committee and the Commissioner of the Department of Resources and Economic Development have recommended that the State enter into this Lease and Operating Agreement with the Operator.

1. **LEASE OF PREMISES.**

The State hereby leases to the Operator and the Operator does hereby lease from the State a certain parcel of land and improvements thereon within and forming part of the Mount Sunapee State Park in the Towns of Newbury and Goshen, New Hampshire, comprising 850 acres, more or less (the "Leased Premises"). The Leased Premises are more particularly described in Appendices 1, 2 and 3 attached hereto and made a part hereof of this Lease and Operating Agreement, entitled Map of Leased Premises, Property Description of Leased Premises and Other Assets Included in Lease. The Operator shall have the right of ingress and egress to and from the Leased Premises over and across all public highways, work roads or trails owned, constructed, or to be constructed by the State within the general area of the Leased Premises. The State warrants that it has good and marketable title to the Leased Premises and that the Leased Premises are free and clear of all liens, encumberences, rights of way, easements or claims of title that may interfere with the Operator's ability to perform its obligations under this Lease and Operating Agreement.

2. **TERM.**

The term of this Lease and Operating Agreement shall be twenty (20) years, beginning on July 1, 1998 and terminating on June 30, 2018, unless earlier terminated as hereinafter provided. The Operator shall have the option of extending the term for two (2) additional ten (10) year periods. The Operator shall give written notice to the

State of its intent to extend the term for an additional ten (10) year period at least one (1) year prior to the expiration of the current term.

3. **RENT.**

The Operator agrees to pay, without demand, to the State as rent for the Leased Premises a base fee of one hundred fifty thousand dollars ($150,000) per year (adjusted annually for inflation) plus a variable fee of three percent (3%) of the Operator's gross annual revenues from the operation of the ski area, payable on or before December 31, 1998 of each year following the ski season year end.

Gross revenues shall mean the total amount received by or accruing to the Operator by reason of the privileges granted under this Lease and Operating Agreement from sales or rentals by the Operator or its subcontractors to patrons, for cash or credit, sold for consumption or use on the Leased Premises, of food, beverages, recreational equipment, rentals, tickets or other merchandise or services, including vending machines or coin operated devices.

The following shall be excluded or deducted from gross revenues:

a. Sales, excise, or other taxes which are imposed upon the sale of goods or services and which are collected by the Operator for remittance to the appropriate government or taxing authority. This exclusion from gross revenues is not intended to apply to any franchise, capital stock, income or similar taxes which are based upon the profits of the Operator.

b. Refunds, discounts, rebates or allowances paid or given by the Operator to ski area patrons.

c. Tips, gratuities or other charges for merchandise or services which are included in the account or bill of a patron.

d. All revenues from the sale or rental of real estate.

The Operator shall maintain an accounting system, including a ticket identification and control system designed to accurately account for the revenues received by the Operator. The Operator shall provide the State a certified public

accountant's statement verifying the amount due and paid at the time of payment of the rent. The Operator shall preserve all of its accounting books and records pertaining to its revenues at the Premises for a period of five (5) years following the close of each fiscal year.

4. **SKI AREA OPERATIONS.**

The Operator agrees to manage and operate the Leased Premises as a public ski area and summer recreational facility to provide year-round outdoor recreational opportunities for the general public. This Lease and Operating Agreement shall entitle the Operator to the right to operate a commercial recreational recreational facility (including all of its support activities) on Mount Sunapee in the Towns of Newbury and Goshen. The State agrees that no other commercial recreational activity shall be authorized at this location.

5. **ANNUAL OPERATING PLAN.**

On or before the 15th day of May during each year of this Agreement, the Operator shall submit to DRED an annual operating plan, including a schedule of the proposed days and hours of operation for the ski area, and a description of the types of recreational activities available to the public. The proposed schedule of operation shall be reviewed by DRED and either approved as proposed, or revised for resubmission. DRED shall notify the Operator in writing of a final schedule of operations no later than June 30th of each year. No changes in the days of operation or the scheduled hours of operation may be made without the prior approval of DRED. The Leased Premises shall not be closed to the public except for emergency or unsafe weather conditions.

The Annual Operating Plan shall describe in detail the following operations:

a. Types of recreational activities available to the public
b. Ski lift operations
c. Snow making and grooming operations
d. Ski support services

i. Ski school
ii. Rentals and repairs
iii. First aid/public safety
iv. Retail ski shop
v. Food and beverage services
vi. Entertainment

e. Maintenance procedures
f. Security procedures
g. Emergency operating plan
h. Status of special use permits and leases
i. Marketing and advertising
j. Environmental management program
k. Signage
l. Utilities and roads
m. Implementation of Master Development Plan site improvements

6. **MASTER DEVELOPMENT PLAN.**

The Operator shall prepare a Master Development Plan ("MDP") covering operations, facilities, site improvements and strategic plans for the ski area by June 1, 2000. The Operator's proposed MDP shall be submitted to DRED and shall be either approved as proposed or revised for resubmission. The MDP shall embody both the Operator's and the State's long term goals for the ski area and shall include all major elements of the Operator's "Proposal for the Operation of the Mount Sunapee Ski Area" submitted on April 1, 1998. The MDP shall include, but not be limited to, plans for expanding the ski trail network, construction of new lifts, construction or renovation of lodges or other facilities, additional water withdrawals from Lake Sunapee to expand snow-making capacity, upgrading or modifying infrastructure, including power, water and sewage disposal systems and such other improvements or

modifications that are appropriate for the recreational use of the Leased Premises. The MDP shall be revised and updated every five (5) years.

7. **SITE IMPROVEMENTS.**

The Operator shall complete site improvements in accordance with the MDP. All plans and specifications for site improvements and structures shall be submitted to DRED for approval at least sixty (60) days before the proposed construction date. All development and improvement projects shall be accomplished without interrupting skiing activities or other public outdoor recreational activities at the ski area.

The Operator shall bear the cost of all renovations and improvements and shall ensure that they are done in a good and workmanlike manner and in compliance with all applicable laws.

Site improvements built or installed by the Operator shall remain the real or personal property of the Operator during the term of this Lease. Title to all site improvements shall vest in the State upon the termination of this Lease.

8. **CONSTRUCTION BONDS.**

The Operator shall purchase, or shall require its contractors or subcontractors to purchase construction bonds issued by a surety or sureties satisfactory to DRED to guarantee the completion of any construction project. The Operator shall also purchase, or require its contractors or subcontractors to purchase labor and materials payment bonds to guarantee the payment for goods and services provided on all construction contracts.

9. **OPERATIONS BOND.**

The Operator shall provide to the State a performance bond in the penal amount of one million dollars ($1,000,000) issued by a surety or sureties satisfactory to the State to guarantee the faithful performance by the Operator of all the terms and conditions of this Lease and Operating Agreement and to indemnify the State and its agents from all loss for failure or inability to perform the obligations undertaken by the

Operator hereunder. An irrevocable letter of credit issued by a financial institution satisfactory to the State in the amount of one million dollars ($1,000,000) may be substituted for the performance bond.

10. RIGHT TO ENTER LEASED PREMISES.

The State and its agents and representatives may enter the Leased Premises at any time for the purposes of inspection.

11. UTILITIES.

The Operator shall be responsible for arranging for and making payment directly to the provider of all utility services required to operate the ski area. Failure by the Operator to pay for any utility services purchased, resulting in termination of the services by the provider, may be considered a material breach of this Lease and Operating Agreement. The Operator shall accept an assignment of the State's rights to discounted electric rates under Special Contract No. NHPUC 97-1 entered into with Public Service Company of New Hampshire.

12. TAXES.

The Operator shall pay all properly assessed real and personal property taxes no later than the due date. Failure by the Operator to pay any duly assessed personal and real estate taxes when due shall be cause to terminate this Lease and Operating Agreement.

13. RATE SCHEDULE.

All rates and prices charged by the Operator for ski lift tickets, admission fees, permit or license fees or other fees to be paid by members of the general public shall be submitted to DRED for its review and approval. All rates and prices charged by the Operator shall be competitive with similar privately operated facilities. DRED's approval shall be automatic unless DRED makes a determination that the rates are not competitive and so notifies the Operator.

14. PUBLIC USE OF THE LEASED PREMISES.

The Operator shall allow public access to the Leased Premises for recreational and park activities as permitted in the Annual Operating Plan.

15. ENVIRONMENTAL PROTECTION.

The Operator shall develop and submit for approval to DRED an Environmental Management Plan adopting recognized Best Management Practices to preserve and protect the Leased Premises, which shall include but not be limited to:

a. Water usage and conservation;

b. Septage disposal/treatment;

c. Drainage, erosion and water quality issues;

d. Solid waste disposal;

e. Air quality and traffic congestion mitigation;

f. Forestry management;

g. Wetlands impacts;

h. Wildlife habitat preservation; and

i. Scenic and aesthetic qualities.

16. MAINTENANCE.

The Operator shall maintain the Leased Premises in first class condition. The Operator, at its expense, shall undertake all maintenance of the facilities, lifts, trails, slopes, ponds, water courses, buildings, structures, roadways and other appurtenances, and housekeeping in all areas of the Leased Premises. The Operator shall be responsible for all litter pickup, trash disposal, cleaning, housekeeping and sanitation within each building and on all grounds within the Premises. At the beginning of the lease term, the State and the Operator shall jointly inspect and document the baseline conditions of all structures, facilities and natural or artificial features of the Leased Premises. The State shall inspect the Leased Premises at least annually and require the Operator to correct any maintenance deficiencies noted.

17. **SECURITY INTERESTS IN LEASED PREMISES.**

A pledge, mortgage or other security interest may be executed by the Operator impairing or encumbering the Operator's interests in this Agreement or any leasehold improvements with the approval of the State. Such approval shall not be unreasonably withheld by the State

18. **COMPLIANCE BY OPERATOR WITH LAWS AND REGULATIONS; EQUAL EMPLOYMENT OPPORTUNITY.**

The Operator shall comply with all statutes, laws, regulations, and orders of federal, state, county or municipal authorities which impose any obligation or duty upon the Operator, including, but not limited to the Land and Water Conservation Fund Act and implementing regulations and state and federal civil rights and equal opportunity laws. During the term of this Agreement, the Operator shall not discriminate against members of the public, employees or applicants for employment because of age, sex, race, creed, color, marital status, physical or mental disability, national origin or sexual orientation and will take affirmative action to prevent such discrimination. The Operator shall comply with all the provisions of Executive Order No. 11246 ("Equal Employment Opportunity"), as supplemented by the regulations of the United States Department of Labor (41 C.F.R. Part 60), and with any rules, regulations and guidelines as the State or the United States issue to implement these regulations.

19. **INSPECTION OF OPERATOR'S RECORDS.**

The Operator agrees to permit the State, or any agency of the United States, access to any of the Operator's books, records and accounts for the purpose of ascertaining compliance with any statutes, regulation and order, and with the terms and conditions of this Agreement. The Operator shall follow Generally Accepted Accounting Principles or Other Comprehensive Bases of Accounting acceptable to the State in recording financial transactions. When requested by the State, the Operator at its own expense shall have its annual accounting reports audited or prepared by a licensed independent accountant acceptable to the State.

20. PERSONNEL.

The performance of this Agreement shall be carried out by employees of the Operator at its own expense. The Operator warrants that all personnel engaged in the services shall be qualified to perform the services, and shall be properly licensed and otherwise authorized to do so under all applicable laws.

21. OPERATOR'S RELATION TO THE STATE.

In the performance of this Agreement the Operator is in all respects an independent contractor. Neither the Operator nor any of its officers, employees, agents or members shall have authority to bind the State or receive any benefits, worker's compensation or other emoluments provided by the State to its employees.

22. ASSIGNMENT, DELEGATION AND SUBCONTRACTS.

The Operator may assign, or otherwise transfer any interest in this Agreement with the prior written approval of the State. Services required under this Agreement may be delegated or subcontracted by the Operator with the prior written approval of the State. Such approval shall not be unreasonably withheld by the State.

23. INDEMNIFICATION.

The Operator shall defend, indemnify and hold harmless the State, and its officers and employees, from and against any and all losses suffered by the State, its officers and employees, and any and all claims, liabilities or penalties asserted against the State, its officers and employees, by or on behalf of any person, on account of, based or resulting from, arising out of (or which may be claimed to arise out of) the acts or omissions of the Operator or its subcontractors, agents or assignees. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the State, which immunity is hereby reserved to the State. This covenant shall survive the termination of this Agreement.

24. **INSURANCE.**

During the entire term of this Agreement, the Operator shall, at its sole expense, obtain and maintain in force, and shall require any subcontractor or assignee to obtain and maintain in force, the following insurance:

a. Comprehensive general liability insurance against all claims of bodily injury, death or property damage, in amounts of not less than three hundred thousand dollars ($500,000) per occurrence and five million dollars ($5,000,000) annual aggregate; and

b. Fire and extended coverage insurance covering the Leased Premises, in an amount not less than one hundred percent (100%) of the whole replacement value of the Leased Premises.

The policies described above shall list the State of New Hampshire as an additional insured. They shall be in the standard form employed in the State of New Hampshire, issued by underwriters acceptable to the State, and authorized to do business in the State of New Hampshire. Each policy shall contain a clause prohibiting cancellation or modifications of the policy earlier than ten (10) days after written notice thereof has been received by the State. Certificates of insurance demonstrating that the required policies are in effect shall be filed with the State before the Agreement is presented to the Capital Budget Overview Committee and the Governor and Executive Council for approval and shall thereafter be renewed or replaced as necessary.

25. **DEFAULT AND TERMINATION.**

Any one or more of the following acts or omissions of the Operator shall constitute an event of default hereunder ("Events of Default"):

a. Failure to operate the ski area in a manner acceptable to the State; or

b. Failure to perform any task or service required by this Agreement satisfactorily or on schedule; or

c. Failure to submit any plan or report required hereunder; or

d. Failure to perform any other covenant or condition of this Agreement.

Upon the occurrence of any Event of Default, the State shall give the Operator a written notice specifying the Event of Default and requiring it to be remedied within, in the absence of a greater or lesser specification of time, thirty (30) days from the date of the notice. If the Event of Default is not timely remedied, the State may treat the Agreement as breached and pursue any of its remedies at law or in equity, effective two (2) days after giving the Operator notice of termination. The State shall also set off against any other obligations the State may owe to the Operator any damages the State suffers by reason of any Event of Default.

26. WAIVER OF BREACH.

No failure by the State to enforce any provisions hereof after any Event of Default shall be deemed a waiver of its rights with regard to that Event, or any subsequent Event. No express failure by the State to notify the Operator of any Event of Default shall be deemed a waiver of the right of the State to enforce each and all of the provisions hereof upon any further or other default on the part of the Operator. Upon the request of the Operator, the State shall issue letters to the Operator's lenders or creditors certifying that there are no outstanding defaults in its performance under this Agreement.

27. AMENDMENT.

This Agreement may be amended, waived or discharged only by an instrument in writing signed by the parties hereto and only after approval of such amendment, waiver or discharge by the Governor and Executive Council of the State of New Hampshire.

28. CONSTRUCTION OF AGREEMENT AND TERMS.

This Agreement shall be construed in accordance with the laws of the State of New Hampshire.

29. **THIRD PARTIES.**

The parties do not intend to benefit any third parties and this agreement shall not be construed to confer any such benefit.

30. **ENTIRE AGREEMENT.**

This Agreement, which may be executed in a number of counterparts, each of which shall be deemed an original, constitutes the entire agreement and understanding between the parties, and supersedes all prior agreements and understandings relating hereto.

31. **APPROVAL CONTINGENCIES**

This Lease and Operating Agreement shall not be final and binding upon the State until it is approved by the Capital Budget Overview Committee of the New Hampshire General Court and by the New Hampshire Governor and Executive Council.

IN WITNESS WHEREOF, the parties have executed this Lease and Operating Agreement as of the day and year first above written.

THE STATE OF NEW HAMPSHIRE

By: _____
Robb R. Thomson, Commissioner
Department of Resources and
Economic Development

OKEMO MOUNTAIN, INC.

By: _____
Timothy Mueller, President

Form, substance and execution approved this 14th day of May 1998.

Michael A. Delaney

Senior Assistant Attorney General
Department of Justice

Approved by Capital Budget Overview Committee this 14th day of May, 1998. CONDITIONED UPON ENACTMENT OF HB 1291 AS AMENDED BY SEN. FRED KING. SEE COMMITTEE MINUTES. GBC

Gene H. Chandler

Approved by the Governor and Executive Council this 10th day of June, 1998.

Robert P. Ambrose

DEPUTY SECRETARY OF STATE

THE SUNAPEE DIFFERENCE, LLC
VR US HOLDINGS, INC.
SECRETARY'S CERTIFICATE

October 5, 2018

I, David T. Shapiro, Executive Vice President, General Counsel & Secretary, of VR US Holdings, Inc. (the "***Parent***"), acting for itself and in its capacity as the sole member of VR NE Holdings, LLC, a Delaware limited liability company, acting for itself and in its capacity as the sole member of Triple Peaks, LLC, a Colorado limited liability company, acting for itself and in its capacity as the sole member of The Sunapee Difference, LLC, a New Hampshire limited liability company (the "***Company***"), do hereby certify that I, as Executive Vice President, General Counsel & Secretary of VR US Holdings, Inc. am a duly appointed officer of the Parent and an authorized representative and signatory for each of the Parent and the Company in connection with the Amendment to Lease and Operating Agreement, dated on or around October 5, 2018, by and between The Sunapee Difference, LLC and the State of New Hampshire, acting through its Department of Natural and Cultural Resources.

IN WITNESS WHEREOF, I have executed this Certificate as of the date first set forth above.

By: _____
Name: David T. Shapiro
Title: Executive Vice President, General Counsel and Secretary

AMENDMENT TO LEASE AND OPERATING AGREEMENT

THIS AMENDMENT to the Lease and Operating Agreement is made by and among the State of New Hampshire, acting through its Department of Natural and Cultural Resources (hereinafter referred to as the "State") with a mailing address of 172 Pembroke Road, Concord, New Hampshire, 03301, and The Sunapee Difference, LLC, (hereinafter referred to as "TSD" or "Operator") with a mailing address of 390 Interlocken Crescent, Suite 1000, Broomfield, CO 80021.

WHEREAS, the State and Okemo Mountain, Inc., entered into a Lease and Operating Agreement dated April 30, 1998 and recorded in the Merrimack County Registry of Deeds at Book 1154, Page 458 and in the Sullivan County Registry of Deeds at Book 2103, Page 308, which was subsequently amended and assigned to TSD (as amended from time to time, the "Lease," and the subject property, the "Leased Premises");

WHEREAS, at the time of this Amendment, Vail Holdings, Inc., a Colorado corporation, wholly owns TSD (indirectly through a wholly-owned subsidiary);

WHEREAS, TSD owns approximately 657 acres of unimproved land located westerly of the Leased Premises (the "TSD Land"); including, a land area of approximately 150 acres in size which is more particularly described on the plan attached hereto as Exhibit A (said 150 acre parcel hereinafter being referred to as the "West Bowl Expansion Land");

WHEREAS, TSD may construct chairlifts, surface lifts, ski trails, a base lodge, parking areas and other building and other infrastructure improvements, which may include, but not be limited to, retail shops, food concessions, equipment rentals, daycare facilities, ticket sales, ski and/or other schools, and other recreational operations infrastructure that will serve the day use skiers and/or other day use recreational users, and which shall be located, with the approval of DNCR, on a portion of the West Bowl Expansion Land (collectively, the "West Bowl Expansion Improvements");

WHEREAS, the following requests related to the possible West Bowl expansion must be included in this Amendment and be approved by the Governor and Executive Council in accordance with RSA 4:40:

- Acceptance of the West Bowl Expansion Land and the West Bowl Expansion Improvements into the Sunapee State Park if an operating chairlift and one or more trails that are accessed by that lift are constructed on the West Bowl Expansion Land,
- Permission to build a chairlift and/or skiing and/or other recreational trails from Mount Sunapee State Park's existing ski area and/or Mount Sunapee State Park onto the TSD Lands,
- Acceptance of the Conservation Lands (as hereinafter defined) into Mount Sunapee State Park,
- Acceptance of any additional easements, rights-of-way, or agreements to ensure that the State has any and all necessary rights of access and use to the West Bowl

Expansion Land and Improvements for future use as a ski area and recreational day use area, including parking lots, infrastructure, and utilities; and,

- Extension of certain terms of the Lease to the West Bowl Expansion Land and TSD Land.

WHEREAS, in addition to the required approvals by DNCR through the Master Development Plan and other certain provisions of the Lease, the West Bowl Expansion Improvements will require various land use and environmental approvals from federal, state and local governmental authorities ("West Bowl Expansion Permits");

WHEREAS, if an operating chairlift and one or more trails that are accessed by the chairlift are constructed, the parties agree that in the event that any residential development occurs on the Private Land (hereinafter defined), there shall be no direct access to or use of the West Bowl Expansion Improvements from the Private Land unless public access is provided from any public road or Brook Road, a parking lot is built for the public to use, and the public has access to the West Bowl Expansion Improvements;

WHEREAS, the grant of the West Bowl Expansion Permits will likely require some of the West Bowl Expansion Land to be subject to restrictions requiring preservation of upland areas and other conservation related restrictions (collectively, the "Conservation Restrictions");

WHEREAS, the implementation and construction of projects like the West Bowl Expansion Improvements are a business and financial decision and are dependent on many factors, including, but not limited to, financing, and changes in market trends and guest expectations;

WHEREAS, therefore, no assurances can be made at this time that the West Bowl Expansion Permits will be sought or obtained, or that the West Bowl Expansion Improvements will be constructed;

WHEREAS, TSD may pay for the construction of the West Bowl Expansion Improvements by borrowing money from banks, other lending institutions and/or other private sources and to secure those loans with a security interest on the West Bowl Expansion Improvements;

WHEREAS, as acknowledged in this Amendment, access to and utilities for the West Bowl Expansion Improvements and West Bowl Expansion Land, which may also serve the Private Land, may be located outside of the West Bowl Expansion Land. The parties to this Lease Amendment agree that all legal rights necessary to operate the ski area and recreational day use area shall be granted to the State and TSD upon the conveyance of the West Bowl Expansion Land and the West Bowl Expansion Improvements;

WHEREAS, TSD shall, under the terms and conditions agreed to in this Amendment, convey in fee the West Bowl Expansion Land together with all necessary non-exclusive perpetual easements for road access from any public road or from Brook Road to provide public access to the West Bowl Expansion Land and the West Bowl Expansion Improvements. In addition to access, TSD shall also execute all necessary non-exclusive perpetual easements, rights-of-way, and/or other agreements, which may include, but are not limited to, rights to use, maintain, improve, repair, replace, rebuild, transfer, operate and manage the ski and other recreational area operations' infrastructure, (including, without limitation, snowmaking, water lines, sewerage treatment facilities, power lines, that may be built on the Private Land. In its

deed to the State, TSD shall carve out and reserve for TSD, its successors and assigns, perpetual necessary easements for parking areas, roads and other infrastructure built on the West Bowl Expansion Land and for utilities necessary for the development of the Private Land;

WHEREAS, upon the completion of construction of the West Bowl Expansion Improvements, the completion of an as-built survey and site plan, and the commencement of operation thereon, the conveyance of title in fee of the West Bowl Expansion Land and the West Bowl Expansion Improvements shall occur and the West Bowl Expansion Land and the West Bowl Expansion Improvements shall be subject to all the terms and conditions of the Lease and Operating Agreement, as amended, and all Master Development Plans (each a "MDP"), approved by DNCR, in the same manner as all other lands constituting the Leased Premises;

WHEREAS, in the event that all of the West Bowl Expansion Improvements are not completed by June 30, 2028, but TSD has constructed an operating chairlift and one or more trails accessed by the lift, then in this event TSD shall complete an as-built survey and site plan and shall transfer the West Bowl Expansion Land and the West Bowl Expansion Improvements, and all necessary easements, rights-of-way, and/or agreements for ski area and other recreational day use infrastructure on the Private Land, including an easement for vehicular access for maintenance and construction purposes, to DNCR by June 30, 2028;

WHEREAS, a portion of the TSD Lands includes the following two (2) parcels of land; the first being approximately 208 acres ("O'Connell Tract") and the second being approximately 52 acres (a portion of the Lewin/Powell parcel, sometimes herein referred to as the "52 Acre Parcel"). These parcels are more particularly described on the Plan attached hereto as Exhibit B (said 260 acres being hereinafter referred to as the "Conservation Lands"). These parcels shall

not become part of the Leased Premises but shall become part of Mount Sunapee State Park. At the time of conveyance, the parties agree that the 52 Acre Parcel shall be transferred with deed restrictions preventing future development;

WHEREAS, as noted on Exhibits A and B, the pictorial descriptions of the West Bowl Expansion Land and Conservation Lands shown on Exhibits A and B, respectively, are approximate only but were done using GPS technology; land surveys and the final description will be done when (a) in the case of the West Bowl Expansion Lands, the West Bowl Expansion Land is permitted and constructed and (b) in the case of the Conservation Lands, when the West Bowl Expansion Improvements are permitted and a Notice to Proceed (as such term is defined below) is issued;

WHEREAS, TSD is willing, under certain circumstances and conditions described below to convey in fee the Conservation Lands to DNCR to be added to Mount Sunapee State Park;

WHEREAS, a portion of the TSD Lands includes approximately 248 acres of land adjacent to the West Bowl Expansion Land that it may privately develop in the future (said 248 acres being referred to as the "Private Land");

WHEREAS, the acreage contained within the West Bowl Expansion Land (approximately 150 acres) may exceed the acreage required by the Town of Goshen's lot coverage and density regulations to construct the West Bowl Expansion Improvements (said excess acreage is deemed the "Excess Density Allocation Acreage");

WHEREAS, to the extent allowed by the Town of Goshen, the parties agree that the Excess Density Allocation Acreage may be used to satisfy, in whole or in part, any lot coverage or density regulations of the Town of Goshen applicable to development of the Private Land as if

the Private Land contained an amount of land equal to 248 acres plus the Excess Density Allocation Acreage;

WHEREAS, DNCR and TSD agree that only the projects and improvements that have been approved in prior MDPs and the 2016-2020 Revised MDP for Polygon 23, and any necessary maintenance, repair, renovation, or replacement of those projects or currently existing improvements in Polygon 23, shall be allowed to be implemented. Additionally, DNCR and TSD agree that there shall be no further development of either ski trails or ski infrastructure in Polygon 20;

WHEREAS, upon conveyance to the State, the West Bowl Expansion Land and Improvements will not be subject to section 6(f)(3) of the Land and Water Conservation Fund Act. However, the State reserves the right to elect to designate the West Bowl Expansion Land under section 6(f)(3) at a later date through mutual agreement with the National Park Service.

The foregoing recitals constitute a part of this Amendment and are incorporated herein.

NOW THEREFORE, for good and valuable consideration, the Parties agree to amend the Lease as follows:

1. **Amend Section 22 of the Lease and Operating Agreement to add the following:**

Operator shall not assign or transfer this Agreement by any means without the prior written consent of the State, which shall not be unreasonably withheld. For purposes of this paragraph, a Change of Control shall constitute assignment. "Change of Control" means (a) a merger, consolidation, or a transaction or series of related transactions in which a third

party, together with its Affiliates, becomes the direct or indirect owner of fifty percent (50%) or more of the voting shares or similar equity interests, or combined voting power of the Operator, or (b) the sale of all or substantially all of the assets of the Operator. Notwithstanding the foregoing, for so long as Vail Holdings, Inc. wholly owns Operator either directly or through a subsidiary, prior written consent of the State shall not be required for assignment of the Lease to, or any transaction involving the transfer of equity interests of the Operator to, any other (direct or indirect) wholly owned subsidiary of Vail Holdings, Inc. Any attempted assignment or transfer in contravention of this paragraph will be null and void.

2. Amend the Lease and Operating Agreement to add the following after Section 31:

32. OVERSIGHT AND ADMINISTRATION OF THE LEASE.

The Mount Sunapee Advisory Commission, established pursuant to the State's Lease Oversight Policy, advises the Commissioner regarding oversight and administration of the Sunapee lease in accordance with RSA 12-A:29-a and meets with the Operator at the call of the Commissioner. The Operator shall meet with the Commission upon request of the Commissioner and shall cooperate with the Commission.

33. WEST BOWL EXPANSION

When all of the West Bowl Expansion Improvements are fully approved and permitted by all authorities having jurisdiction (after expiration of all applicable appeal periods) and when Operator has issued a written notice to State stating that it intends to construct the West Bowl Expansion Improvements in accordance with the West Bowl Expansion Permits (the

"Notice to Proceed to Construct") but prior to actual construction commencing construction of such improvements, Operator shall convey in fee the two hundred sixty (260) acres of Conservation Lands to State as described on Exhibit B to be added to Mount Sunapee State Park. The Conservation Lands shall not become a part of the Leased Premises but shall become a part of Mount Sunapee State Park. At the time of conveyance, the parties agree that the 52 Acre Parcel shall be transferred subject to deed restrictions preventing future development of such land.

When and if the West Bowl Expansion Improvements are completed, or when Operator has constructed an operating chairlift and one or more trails that are accessed by the lift, Operator shall convey in fee the West Bowl Expansion Land and the West Bowl Expansion Improvements by June 30, 2028, to State and the description of the Leased Premises shall be amended in fact to include the West Bowl Expansion Land and the West Bowl Expansion Improvements, which shall be free and clear of all real estate mortgages but subject to the Excess Density Allocation Acreage restriction, the Conservation Restrictions and any security interests in the West Bowl Expansion Improvements. If and to the extent that access to and/or utilities for the West Bowl Expansion Improvements or the West Bowl Expansion Land are located outside of the West Bowl Expansion Land, at the time of the conveyance of the West Bowl Expansion Land to State, Operator shall cause all legal rights necessary to operate the ski area and recreational day use area to be granted to State. In addition, at the time of the conveyance of the West Bowl Expansion Land to State, Operator shall also execute all necessary non-exclusive perpetual easements, rights-of-way, and/or other

agreements, which may include, but are not limited to, rights to use, maintain, improve, repair, replace, rebuild, transfer, operate and manage the ski and other recreational area operations' infrastructure, (including, without limitation, snowmaking, water lines, sewerage treatment facilities, power lines), that may be built on the Private Land. In its deed to State, Operator shall carve out and reserve for Operator, its successors and assigns, perpetual necessary easements for parking areas, roads and other infrastructure built on the West Bowl Expansion Land and for utilities necessary for the development of the Private Land. At the time of conveyance of the West Bowl Expansion Land to State, the description of the Leased Premises shall be amended to add the West Bowl Expansion Land as a part of the Leased Premises. Such description shall be recorded in the Merrimack and Sullivan County Registries of Deeds, along with Mylars of the As-Built Survey of the Leased Premises including the West Bowl Expansion Land. The State shall be authorized, upon approval of this Amendment by Governor and Council, to add such As-Built Survey as a new Appendix I to the Lease and to include a revised legal description of the Leased Premises including the West Bowl Expansion Land as a new Appendix II, which legal description will define the revised Mount Sunapee Resort leasehold.

Attached to this Amendment as Exhibit A is the planned West Bowl Expansion Land boundary as agreed to by the parties and approved by the Governor and Executive Council in accordance with RSA 4:40, subject to the final boundary to be established in the As-Built Survey to be completed at least 3 months prior to the transfer of the West Bowl Expansion Land to the State. The parties agree that the boundary of the West Bowl Expansion Land, as

shown in Exhibit A and then as shown in the final As-Built Survey, shall not change at any point by more than 150 feet, except in the proposed areas of the base lodge and parking lot, as shown on Exhibit A where the boundary may change by more than 150 feet between GPS points N:298.598, E:869.954 and N:297.342, E:870.642.

Upon approval of this Amendment by the Governor and Executive Council, the State shall be authorized to execute an easement authorizing Operator to build, repair, maintain, replace and operate a chairlift, and any necessary infrastructure, and a ski trail on the Leased Premises to the West Bowl Expansion Land once it moves forward with construction after the Notice to Proceed is issued.

Upon approval of this Amendment by the Governor and Executive Council, the West Bowl Expansion Land and Improvements shall be subject to Section 5 (Annual Operating Plan), and Section 7 (Site Improvements) of the Lease, as amended, and the applicable provisions of the 2016-2020 Revised Master Development Plan, as approved by State, in the same manner as all other lands currently constituting the Leased Premises.

If and when Operator constructs an operating chairlift and one or more trails that are accessed by the lift, the West Bowl Expansion Land also shall be subject to Section 3 (Rent), Section 12 (Taxes) and Section 15 (Environmental Management) of the Lease, as amended.

In the event that any of the West Bowl Expansion Improvements are built on the Private

Land by Operator, its affiliates and/or its assigns and those improvements are competitive with services provided by the ski area, then all revenue generated from these Improvements while any of the facilities at Mount Sunapee Ski Area are open to the public during the winter ski season will be subject to the three (3%) percent Lease payments as long as Operator operates the ski area.

In the event that the West Bowl Expansion Improvements are not completed or Operator has not constructed an operating chairlift and one or more trails accessed by the lift on the West Bowl Expansion Land by June 30, 2028, this Amendment to the Lease shall be null and void in all respects. Notwithstanding any provision set forth in the Lease to the contrary, and notwithstanding any and all rights available at law or in equity, the parties hereby acknowledge and agree that Operator is not obligated to seek or obtain the West Bowl Expansion Permits or construct the West Bowl Expansion Improvements. Further, in the event that such West Bowl Expansion Improvements are not completed or Operator has not constructed an operating chairlift and one or more trails accessed by the lift on the West Bowl Expansion Land by June 30, 2028, then Operator shall not be considered in breach of the Lease, but any and all associated approvals granted in the 2016- 2020 Revised MDP, and future MDPs, related to the West Bowl Expansion Improvements shall be withdrawn and not be effective as of June 30, 2028.

3. Amend Section 25 of the Lease and Operating Agreement (Default and Termination) to add the following:

If Operator constructs an operating chairlift and one or more trails accessed by the lift on the West Bowl Expansion Land but fails to convey the West Bowl Expansion Land and Improvements to the State on or before June 30, 2028, Operator shall be prohibited from operating the chairlift and accessing the trails. The State reserves all rights to pursue Operator for any other legal remedies available to it outside of and not affecting the Lease, any amendments thereto, or any of the terms thereunder.

Any capitalized terms not otherwise defined in this Amendment shall have the meanings ascribed to such terms in the Lease and the amendments thereto.

In all other respects, the Lease remains unmodified and in full force and effect.

[signatures on pages following]

IN WITNESS WHEREOF, the undersigned have executed this Amendment to Lease and Operating Agreement as of the date and year first written above.

STATE:

STATE OF NEW HAMPSHIRE
DEPARTMENT OF NATURAL & CULTURAL RESOURCES

By: _____
Sarah Stewart, Commissioner

STATE OF NEW HAMPSHIRE
COUNTY OF MERRIMACK

At _____, in said County this ___ day of _____, 2018, personally appeared Sarah Stewart, Commissioner of the Department of Natural & Cultural Resources and such person acknowledged this instrument to be her free act and deed in such capacity, and the free act and deed of State of New Hampshire.

OPERATOR:

THE SUNAPEE DIFFERENCE, LLC

By: _____
Name: David T. Shapiro
Title: EVP, GC + Secretary

STATE OF COLORADO
COUNTY OF BROOMFIELD, S.S.

Then personally appeared before me, the above named DAVID T. SHAPIRO, as EVP, GC + SECRETARY of The Sunapee Difference, LLC and such person acknowledged this instrument to be his free act and deed in such capacity, and the free act and deed of The Sunapee Difference, LLC.

_____
Notary Public
My commission expires: 02/05/2021
Notary Seal or Stamp:

KARA M.W. BOWYER
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20134006946
MY COMMISSION EXPIRES FEBRUARY 5, 2021

Form, substance and execution approved this ____ day of October, 2018.

_____
Dianne Martin, Senior Assistant Attorney General

Approved by the Governor and Executive Council this ____ day of _____, 2018.

Item No. _____ _____

APPENDIX B

MOUNT SUNAPEE

Environmental Management Plan 2020–2025

June 2020

Prepared by:

SE GROUP

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I. Introduction

Mount Sunapee is dedicated to the protection of the environment and ensuring that the values of environmental stewardship are in the forefront of our planning efforts. We understand the balance between resource protection, recreational opportunity and fiscal responsibility. All three must be in harmony if we are to achieve our management objectives and those set forth in the Lease.

Pursuant to Section 15 of the Lease and Operating Agreement (herein "the Lease") signed with the State of New Hampshire Department of Natural and Cultural Resources (formally a division of Department of Resources and Economic Development) on April 30, 1998, Mount Sunapee submits this Environmental Management Plan (EMP).

The Master Development Plan (MDP) provides a broad road map for the major improvements over the next five years at Mount Sunapee. The focus of this EMP is to respond to the overall impacts of the proposed MDP, recognizing its generalities.

This EMP addresses existing environmental conditions within the leasehold and anticipated environmental impacts from the proposed expansion into the West Bowl area. We have created this document around the specific environmental categories mentioned in Section 15, Environmental Practices, of the Lease and Operating Agreement. We have also added several categories to address other potential environmental and development concerns. Where appropriate, we have also addressed the continued implementation of the Summer Adventure Park and non-winter uses on relevant criteria of the EMP.

At this time, it is not possible to address all potential impacts from the implementation of the MDP. During the state and local permitting process, additional information will be provided with the Site Plan Review application to the Towns of Newbury and Goshen, and with the applicable applications to the New Hampshire Department of Environmental Services.

When the West Bowl expansion was originally proposed in 2005, many studies were conducted to assess this project's impacts. These studies included wildlife habitat, rare and endangered species, wetlands, watershed run-off, traffic and economic impacts. As considerable time has passed since these studies were completed, the future pursuit of state and local permits for the West Bowl will likely require an update.

For reference, we have included the original West Bowl impact studies in this EMP, and we have addressed other areas where our planning provides some guidance towards creating an environmental management approach.

As the projects described in the MDP move forward, specific design plans will be created, and the potential impacts will be addressed at a level of detail appropriate to their scale and required permitting.

II. Water Usage and Conservation

A. Water Usage

1. Potable Water

Mount Sunapee continues to renovate and improve our potable water system. Mount Sunapee maintains, monitors and tests the potable water supply pursuant to NH-Department of Environmental Services (NHDES) regulations.

A certified hydrogeologist (see Appendix A) tested the Mount Sunapee base area well in 1999 to determine its capacity. The test found that this well has a design flow rate of 73.1 gallons per minute (gpm) or 105,216 gallons per day (gpd). This capacity provides the resort base area with considerable capacity without the need to identify new potable water sources. This well is located at the base of the Duckling Lift within a 400-foot radius Sanitary Protection Area (SPA). The SPA does not allow for the storage of petroleum products or the use of chemical fertilizers in the area.

The vast majority of potable water consumption at Mount Sunapee occurs during the winter ski season. Over the past five years the average annual potable water usage from the base area well has been approximately 1,511,360 gallons. Additional wells service the much lower potable water requirements at the Summit Lodge and the maintenance shop. These wells have averaged 33,652 and 74,388 gallons per year respectively over the past five years. A summary of the recent potable water usage is provided in Table EMP-1.

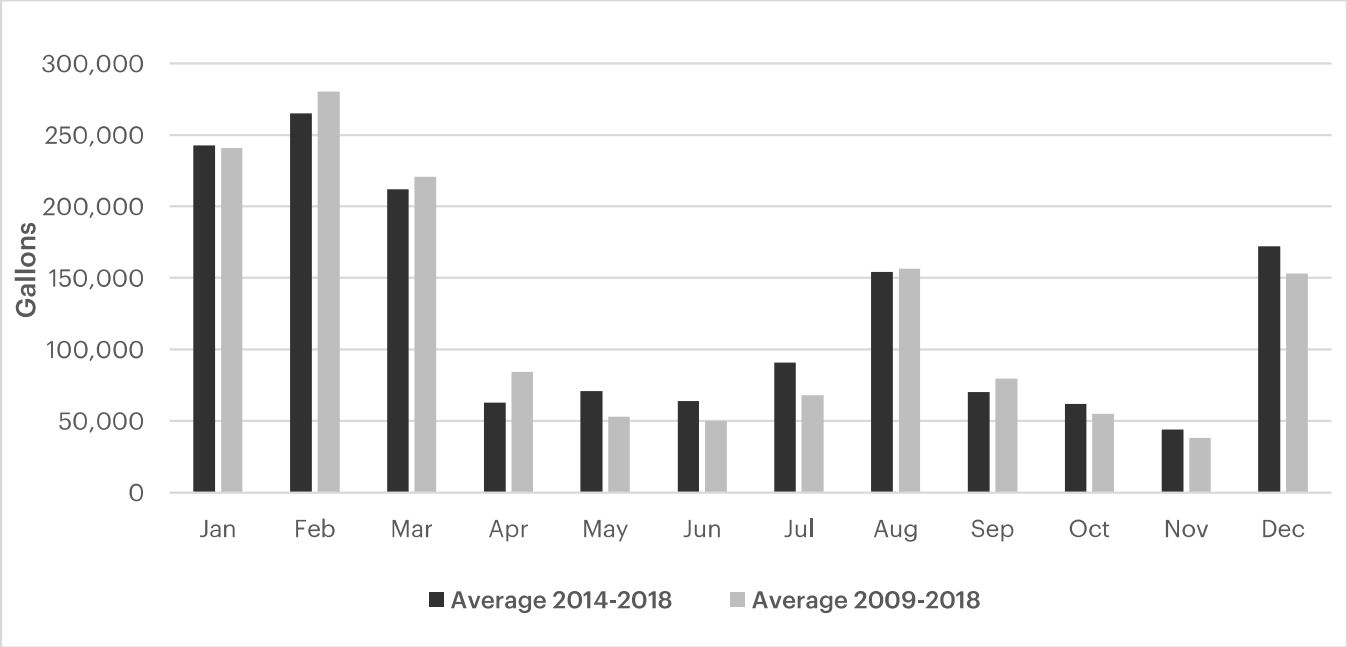
Table EMP-1. Potable Water Usage – 2014 to 2018

Year	Total Potable Water Used (gallons)	Base Area Well (gallons)	Summit Lodge Well (gallons)	Maintenance Shop Well (gallons)
2014	1,764,230	1,629,400	47,500	87,330
2015	1,492,220	1,373,800	42,780	75,640
2016	1,471,950	1,380,000	33,250	58,700
2017	1,445,500	1,342,500	23,670	79,330
2018	1,382,900	1,290,900	21,060	70,940
TOTAL (2014–2018)	**7,556,800**	**7,016,600**	**168,260**	**371,940**
AVERAGE (2014–2018)	**1,511,360**	**1,403,320**	**33,652**	**74,388**

Summer Use

Chart EMP-1 illustrates that non-winter demand for potable water represents a small fraction of the peak winter use. August exhibits the highest water use during the summer, coinciding with the annual League of NH Craftsmen's Fair which draws approximately 30,000 visitors each year. The expectation is that summer events and the Adventure Park will not generate enough additional visitation to tax the water or wastewater facilities, and any increases would be easily accommodated by the unused capacity during non-winter months.

Chart EMP-1. Average (2014–2018) Potable Water Used (gallons) By Month



Water consumption at Mount Sunapee continues to be far below the capacity of the water supply system and this reserve capacity will continue to meet the demand for potable water anticipated during implementation of the MDP within the existing leasehold.

West Bowl Expansion

The distance between the existing potable water system and the West Bowl expansion would likely require development of a new water source and system to support the base area of the West Bowl. Detailed engineering studies of water needs and sources may be required to address these issues.

2. Snowmaking

Snowmaking is a vital component in the operation of a successful ski resort in the eastern United States. Mount Sunapee is fortunate to have Lake Sunapee and its abundant water supply adjacent to the mountain for its snowmaking water supply. We manage this resource carefully as we recognize how important Lake Sunapee is to our resort and to the greater community and region. The substantial surface area of Lake Sunapee, at 4,090 acres, enables us to withdraw enough water to support our snowmaking operations without causing any measurable impact to the lake.

Mount Sunapee's water withdrawals for winter snowmaking from Lake Sunapee are regulated by a water withdrawal permit (#2000-02687) from the NHDES. This permit allows Mount Sunapee to use Lake Sunapee for its snowmaking water supply during the winter months.

In 2007, Mount Sunapee purchased 58 new high-efficiency HKD SV-10 snow guns. Since 2007, an additional 80 SV-10 snow guns have been purchased, giving us a total of 138 of these energy efficient snow guns.

The efficiency of these snow guns has allowed Mount Sunapee to retire all four of its diesel air compressors that were used exclusively for snowmaking. This has resulted in the significant savings of over 12,000 gallons of diesel fuel annually. Mount Sunapee currently uses three electric air compressors for snowmaking and uses the energy efficient HKD snow guns as much as possible.

The replacement of all fluorescent lighting to higher efficiency ballasts and bulbs has also contributed to this reduction in electricity consumption. Motion sensor lighting switches have been installed in all restrooms and some other areas to reduce electricity usage when those areas are not being used. The following chart and table summarize the snowmaking activities of Mount Sunapee since the 2004/05 ski season.

Chart EMP-2. Snowmaking Water Consumption – 2004/05 to 2018/19

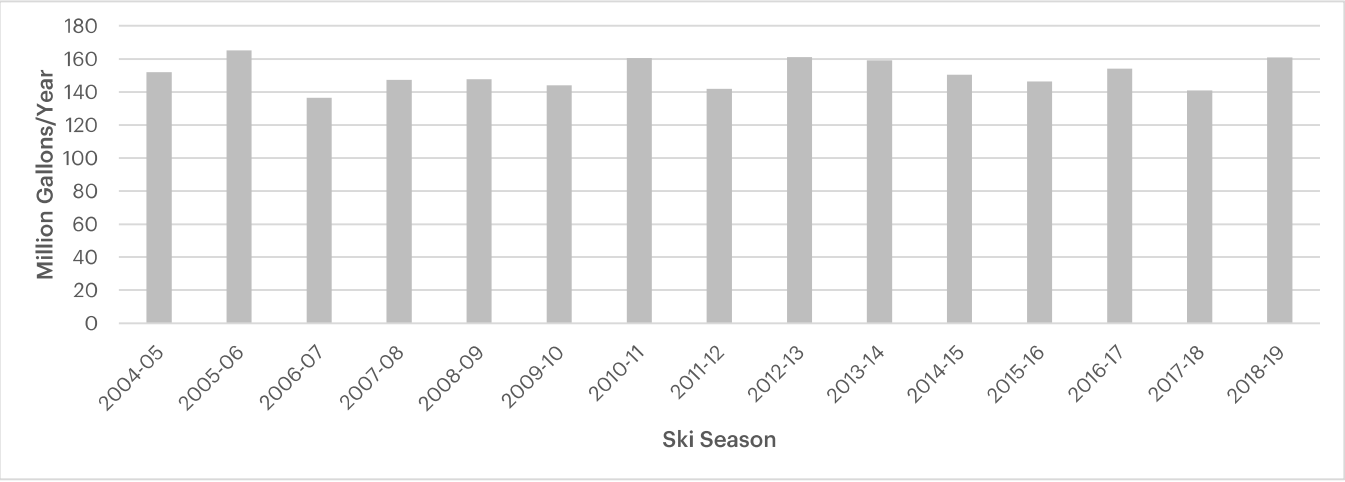


Table EMP-2. Snowmaking Water Consumption – 2004/05 to 2018/19

Snowmaking Season	Gallons Pumped (total)	Maximum Pumping Rate (gpm)	Operating Hours	Acres Covered	Acre-Feet Produced	Average Depth (feet)
2004/05	151,851,000	5,000	690	195	843.6	4.33
2005/06	165,000,000	5,000	745	195	916.7	4.70
2006/07	136,416,000	5,000	696	202	757.9	3.75
2007/08	147,268,000	5,000	674	204	818.2	4.01
2008/09	147,730,575	5,000	735	204	820.7	4.02
2009/10	144,028,387	5,000	622	204	800.2	3.92
2010/11	160,413,000	5,000	777	204	891.2	4.37
2011/12	141,872,528	5,000	653	207	788.2	3.83
2012/13	161,007,579	5,000	766	207	894.5	4.34
2013/14	159,058,098	5,000	670	207	883.7	4.29
2014/15	150,456,780	5,000	697	207	831	4.01
2015/16	146,237,886	5,000	736	207	807	3.9
2016/17	154,126,505	5,000	743	207	854	4.13
2017/18	140,933,032	5,000	666	207	776	3.75
2018/19	160,973,166	5,000	736	207	882	4.26
5-YEAR AVERAGE	150,545,474	5,000	716	207	830	4
10-YEAR AVERAGE	151,158,169	5,000	707	204	838	4.07

Notes:
Maximum snowmaking pumping rate has been maintained at 5000 gpm since 2001/02.
Six acres (Elliot Slope) added to snowmaking system coverage in 2006.
Four acres (Eastside and Portage) added to snowmaking system coverage in 2007.
Snowmaking was added to Outer Ridge in 2012.
Acre feet are calculated by using an average of 180,000 gallons/acre feet of snow.

Based on the past five ski seasons, Mount Sunapee is averaging about 150,500,000 gallons of snowmaking withdrawal per year. Higher withdrawal volumes for snowmaking generally occur in years with mild winter temperatures and/or lower natural snowfall amounts. Mount Sunapee's current snowmaking water withdrawal permit is sufficient to meet its future needs.

To put Mount Sunapee's snowmaking water usage into perspective, if 100% of Mount Sunapee's annual snowmaking water were to be instantaneously withdrawn from Lake Sunapee, the lake level would be reduced by only 1.33 inches (one and one-third inches).

Snowmaking water withdrawals typically occur over a four-month period from mid-November to early March. Based upon the total hours of snowmaking during this period, the average daily water usage would impact the lake level by approximately 1/32nd of an inch. Natural recharge to the lake on any given day most likely exceeds any snowmaking water withdrawals.

West Bowl Expansion

The current MDP terrain upgrading plan identifies 104.5 acres of additional terrain to be added to Mount Sunapee's developed trail network.

A total of 56.2 acres of new ski terrain is proposed for the West Bowl expansion area. The currently permitted water reserve capacity is adequate to accommodate this projected growth.

Once constructed, the addition of this new terrain would bring the total developed trail area to 321.5 acres. In addition, Mount Sunapee currently has 17 acres of glades and the upgrading program adds another 7 acres. Glades are not covered by the snowmaking system.

B. Water Conservation

Mount Sunapee's focus on encouraging water conservation since the inception of the lease in 1998 has resulted in a reduction in wastewater flows. In 2006 all fixtures (water closets and lavatories) in the Spruce Lodge were replaced with low flow fixtures as part of these continuing efforts.

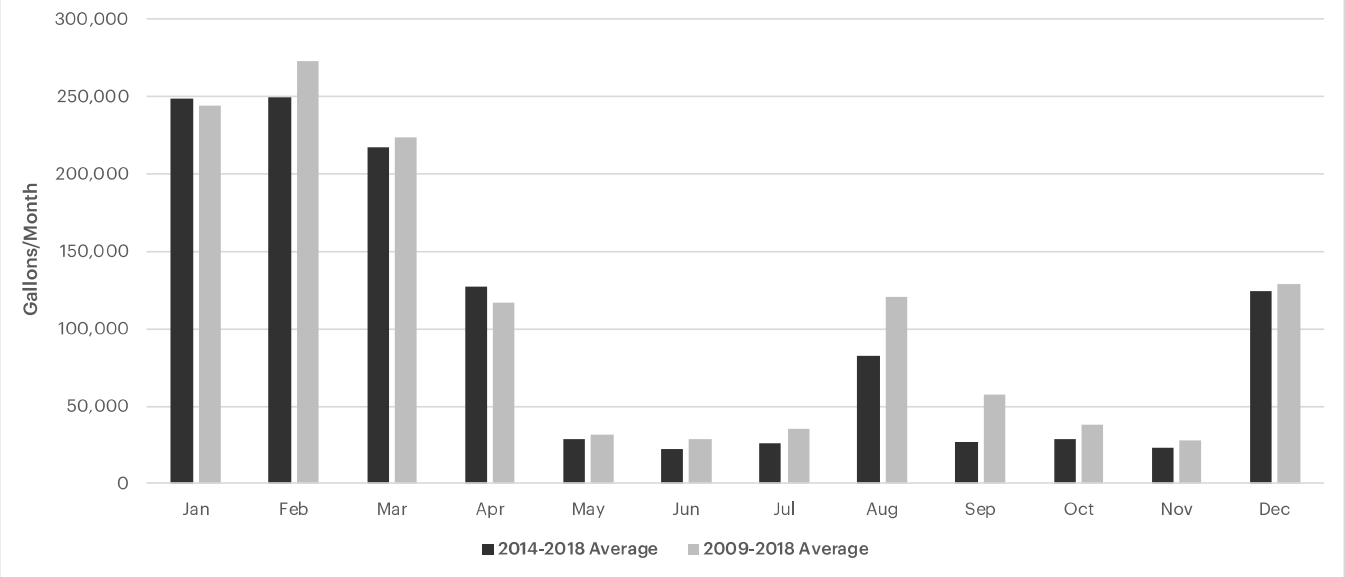
Chart EMP-3 compares the five-year average wastewater flows (2014–2018) with the ten-year average wastewater flows. Most months (with the exception of January and April) indicate a reduced demand on the wastewater system. As would be expected, the vast majority of wastewater flows from Mount Sunapee occur during the ski season (Chart EMP-3).

Table EMP-3. Annual Wastewater Flows – 2014 to 2018

Year	Wastewater Influent (gallons)
2014	1,305,536
2015	1,314,822
2016	1,045,474
2017	1,031,220
2018	1,319,102
AVERAGE (2014–2018)	1,203,231
AVERAGE (2009–2018)	1,270,657

Notes:
Attendance figures do not include summer operations.
1999 water consumption was 5.32 gallons per person.

Chart EMP-3. Average (2014–2018) Wastewater Flows (gallons) by Month



III. Wastewater Disposal/Treatment

Mount Sunapee Resort currently operates a lagoon and spray field system for on-site wastewater treatment and disposal under NHDES permit #GWP-198801026-N-006. Mount Sunapee staff, licensed with the State of New Hampshire, operates, monitors and maintains this system. The monitoring program utilizes a series of monitoring wells with chemical and biological sampling requirements.

Currently a separate septic tank and leach field system provides sewage disposal at the Summit Lodge. Annual pumping of the septic tank at each lodge is part of a routine maintenance program for the system.

Mount Sunapee continues to use the engineering services of Hoyle Tanner Associates for its wastewater systems as they have over twenty years of experience with the Mount Sunapee system. They are retained to:

1. evaluate the integrity of the existing systems,
2. evaluate the capacity and utilization of the existing systems,
3. study the future wastewater requirements at Mount Sunapee,
4. make recommendations on how to meet the future wastewater requirements at Mount Sunapee, and
5. design appropriate expansion measures to meet future requirements.

In the spring of 2000, Mount Sunapee completely rebuilt the existing spray field lines due to the age and condition of the existing disposal lines. The new spray lines can operate nozzles individually, increasing spray effectiveness within the disposal area.

An additional engineering report by Hoyle Tanner and Associates, Inc. in March 2003 (see Appendix B), suggested that the wastewater system (lagoons and spray fields) provides adequate capacity. Mount Sunapee does not propose to expand the wastewater lagoons.

The current permitted capacity of the spray fields is 250,000 gallons per week of lagoon effluent. Mount Sunapee has proposed to expand the spray field by 15–20% to allow better ability to dispose of lagoon effluent during the permitted spring, summer and fall spraying seasons. In very rainy spring and fall periods, the soil conditions may be too saturated to permit spraying. Although Mount Sunapee has not expanded the spray fields to date this remains a viable option in the overall management of the wastewater system. Our primary lagoon management objective is to have the full storage capacity of the lagoons maximized by completely emptying the lagoon by October 31st of each year.

Summer Use

The current use and planned expansion of the Summer Adventure Park does not adversely affect the ability of the current wastewater treatment system. The attendance for non-winter uses, in addition to representing only a small fraction of the overall resort attendance, also occurs during months when use of the spray fields is permitted.

Overall, the current wastewater systems are expected to meet all anticipated wastewater disposal requirements for implementation of the MDP within the existing leasehold.

West Bowl Expansion

The proposed expansion in the West Bowl area will require the development of a new wastewater disposal system to service the proposed base lodge in that area.

The West Bowl base lodge is envisioned as a smaller "satellite" base lodge with limited services compared with the primary base lodges. The type of wastewater disposal system needed has not been determined. Mount Sunapee will work with professional engineers and the State of New Hampshire to develop a certified wastewater disposal system to meet the required demands for the West Bowl.

IV. Drainage, Erosion and Water Quality Issues

Two named permanent streams, Beck Brook and Johnson Brook, flow out of the Mount Sunapee drainage basin. As named permanent streams, they are afforded protection under the Shoreline Zoning Regulations of both the Town of Newbury and NH-DES. The general location of the existing Mount Sunapee base area is depicted on Figure EMP-1. These named streams are identified on Figure EMP-2.

Mount Sunapee recognizes the importance Johnson Brook has as one of the major tributaries flowing into Lake Sunapee. Mount Sunapee continues to prevent degradation of Johnson Brook by using Best Management Practices to prevent soil erosion in the Sun Bowl area. For example, we have evaluated the size of culverts on the summit work road and on ski trails in the Sun Bowl area. New water bars on the summit road minimize erosion in the gravel road base. All of these measures continue to provide protection of Johnson Brook.

Mount Sunapee has continued to work in cooperation with the Lake Sunapee Protective Association (LSPA), to develop measures that prevent or minimize sedimentation along Beck Brook as it flows through the base areas. Since 1998, measures have included the development of small sediment basins to catch parking lot run-off, creation of new drainage swales and sediment dams, and creation of stabilization systems along important segments of Beck Brook. In some instances, LSPA has provided design services with construction and maintenance by Mount Sunapee. Based on the annual maintenance of these systems, it appears that substantial amounts of sediment are being captured.

Mount Sunapee utilizes the New Hampshire Stormwater Manuals, volumes 1-3, published in December 2008 for guidance in managing storm water run-off, soil stabilization and erosion control methods.

When soils are disturbed on the mountain, Mount Sunapee utilizes the Vermont Conservation Mix, a highly recommended seed mixture for ski slopes containing a mixture of fast germinating annual rye grasses and other perennial grasses for re-vegetation of the disturbed areas. Mount Sunapee owns an agricultural tractor and a power mulcher for effectively blowing hay over the Vermont Conservation Mix when re-seeding and stabilizing disturbed areas.

Mount Sunapee also protects groundwater resources from fuel and other hazardous materials. Employees are educated on the proper techniques for handling, storing and disposing of hazardous materials. Mount Sunapee has procedures and technologies in place for protecting and monitoring above and below ground tanks. Beyond regular safety meetings, Mount Sunapee personnel routinely inventory containment systems and materials. These personnel are equipped and trained to respond to fuel spills of less than 25 gallons in a safe and expeditious manner. For spills in excess of 25 gallons, personnel are familiar with procedures for notifying the NHDES Oil Response Team.

West Bowl Expansion

Within the West Bowl, one unnamed brook is noted moving downhill through the center of the site. The location of this drainage is also noted on Figure EMP-2. Pioneer Environmental Associates conducted a hydrologic resource inventory along the portions of this unnamed brook within the project site in 2001 and again in 2004 (see Appendix C). In general, they characterize the drainage as being perennial in nature and having been impacted by intense logging within the private lands.

This brook flows westward then south through a known wetland area into Gunnison Brook (see Photo 1). At this point, Gunnison Brook continues to move westward parallel to Brook Road.

It is important to note that Gunnison Brook does not flow into Lake Gunnison. Lake Gunnison, also known locally as the "Goshen Ocean," lies within the Sugar River Watershed area on Blood Brook (see Photo 2). The Blood Brook was dammed in this part of the valley to create the lake. Although Gunnison Brook and Lake Gunnison both lie within the Sugar River Watershed, Lake Gunnison is fed by Blood Brook, and is not hydraulically connected to Gunnison Brook. Chandler Hill and other mountain peaks create a drainage divide between the Gunnison Brook and Blood Brook, separating these two watersheds. Waters from these two brooks meet in Goshen, across Route 10 from Brook Road, where the South Branch of the Sugar River begins.

Due to the hydraulic separation of the lake from Gunnison Brook, there is no potential for the water level or water quality to be affected by snowmelt or runoff from the proposed trails and improvements within the West Bowl area.



Photo 1. Confluence of unnamed brook and Gunnison Brook near Brook Road

A second major water body, Rand Pond, lies within the Gunnison Brook Watershed. The pond's watershed area is approximately 270 acres and does not receive any runoff from the West Bowl area. Rand Pond is fed by numerous tributaries, and it outflows drain into the Gunnison Brook. Since the pond is located hydraulically up-gradient of the Gunnison Brook, its inflows and water quality will not in any way be affected by runoff from the West Bowl area. These watershed areas are depicted on Figure EMP-3.

The analysis of the hydrologic conditions within this watershed, prepared by Bruno Associates was completed to identify the characteristics of the watershed so that an appropriate BMP strategy for water quality can be created (see Appendix D). The results of this study show that Gunnison Brook presents the major drainage in which runoff and snowmelt will flow from the West Bowl area. It also shows that the amount of runoff projected from snowmelt will have little impact on overall stream flows during the spring melt-off period.

Given this background, while Mount Sunapee's efforts within the current leasehold has been to create new solutions within existing developed areas, the expansion with the West Bowl will allow for more proactive efforts to protect and preserve water quality within the new watershed. Mount Sunapee fully anticipates working closely with the NHDES, LSPA, professional engineers and hydrogeologists and our local communities, to develop storm water and erosion control systems that provide the necessary detention and treatment of runoff at all times of the year.



Photo 2. Lake Gunnison looking northeastward to Mount Sunapee

V. Solid Waste Disposal

Although solid waste is generated in many forms at Mount Sunapee, the handling of these wastes is done pursuant to the relevant regulations and guidelines for the disposal of such waste.

Mount Sunapee does not use the transfer stations in the Town of Newbury or Goshen for any of its solid waste. All solid waste removal is done on a contract basis with Casella Waste Management.

The waste reduction and recycling efforts at Mount Sunapee have increased dramatically over the past ten years. Currently cardboard, glass, maintenance shop waste oils, food service cooking oils, light bulbs, batteries and scrap metals are all recycled.

In the fall of 2010, Casella Waste Management began offering single stream recycling and Mount Sunapee began using that program to increase its recycling efforts. Currently, approximately 38% of all waste generated in our winter operations are recycled through this program. Each year, we try to increase the percentage of recycled waste.

Mount Sunapee expects to be able to fully manage the solid waste for all future upgrades and increases in CCC as described in the MDP.

VI. Air Quality and Traffic Congestion Mitigation

A. Air Quality

On January 31, 2014, the NH Department of Environmental Service's Air Resources Division approved a General State Permit (#GSP-EG-0427) to Mount Sunapee for the operation of the four emergency evacuation engines on the chair lifts.

For the past five winter seasons (2014/2015 to 2018/2019), the maximum operation for our emergency evacuation engines has been between 44 and 78 hours. Evacuation engine use consistently operates within the limits set forth in the permit.

Mount Sunapee continues to investigate ways to reduce fuel usage through both conservation and through capital investment in newer, more fuel-efficient technologies.

An example of this was the replacement of the original 1962 boiler in the Spruce Lodge in the summer of 2013. The existing boiler was a single stage, 100% duty fuel oil boiler. It was replaced with a two stage, propane fired boiler. Only the first stage of the boiler operates when the demand on the boiler less than 50% of its capacity. Only when the demand is greater than 50% capacity does the second stage come on-line.

Summer Use

Summer operations are not expected to generate significant evacuation engine usage, and given the current operation only presents 15% of the maximum allowable, usage is expected to be below operational limits.

West Bowl Expansion

The proposed chairlift in the West Bowl will be required by ANSI B77.1 Passenger Tramway Code to include an emergency evacuation engine. This will likely be a 500 to 600 horsepower diesel engine.

Mount Sunapee will modify its General State Permit with NHDES to include the additional emissions from this engine.

B. Traffic Congestion

At present, Mount Sunapee has approximately 2,130 parking spaces to accommodate visitors and employees. This total does not include the 272 spaces in parking lot #4 which has not been built yet and would have to be re-permitted as the previous permits have lapsed.

Mount Sunapee has a Special Use Permit from the New Hampshire Department of Natural and Cultural Resources (DNCR) which allows overflow parking at the Lake Sunapee State Beach parking area on peak winter days. Over the past five years this overflow lot has been used approximately five to six days per winter season.

Usually, the State Beach parking lot is used on peak holiday periods such as during the Christmas to New Year's holiday week, the January Martin Luther King weekend, and the February President's Day weekend. When the State Beach parking lot is used, Mount Sunapee provides employees and guests with shuttle bus service from the beach parking area to the main base area.

As a condition of this permit, Mount Sunapee provides winter plowing of the beach access road and parking area for DNCR. Plowing happens regardless of whether the parking area is used for overflow during the winter season. Plowing allows public winter access to Lake Sunapee for ice fishing, snowmobiling, hard water sailing and other recreational activities.

Heavy traffic volume at Mount Sunapee is generally associated with a few predictable days throughout the year. Approximately eight to ten days, typically the peak holiday periods described above, during the ski season experience very heavy traffic volumes.

Summer

Similarly, during the summer months, the nine-day period during the Craft Fair has increased traffic volumes, although it is spread out over a greater part of the day. Peak arrival traffic generally occurs between 8:30 a.m. and 10:30 a.m. Peak departure traffic occurs in a more concentrated pattern generally between 3:30 p.m. and 4:45 p.m. The continued implementation of the Summer Adventure Park has not materially changed the observed traffic pattern due to the much lower car counts for the summer operations.

West Bowl Expansion

In 2004, Mount Sunapee commissioned a study of traffic impacts and site access associated with the implementation of the MDP, including the West Bowl expansion (see Appendix E). This study, among other things, noted roadways in the area generally had additional capacity to handle new vehicle trips, some intersections in the area have a pool "Level of Service" and may require some mitigation strategies including use of police officer controls or lane widening.

The baseline conditions for the traffic study may need to be updated prior to any finalizing of planning for the West Bowl Expansion. This update would clarify existing traffic flows and ascertain the appropriate mitigation measures.

VII. Forestry Management

Mount Sunapee recognizes that it must balance natural resources and outdoor recreation. Our identity is linked to how well the natural environment contributes to the sense of being "in" nature. Protection of our forest resources is a critical component in creating this identity.

A. Timber Management

The forest within the Lease area is not currently managed for timber harvesting nor is timber harvesting an activity in which Mount Sunapee is engaged. Tree clear-cutting is done solely for the purpose of new ski trail construction. Selective cutting of trees and brush is a routine maintenance activity along the edges of existing ski trails. Although large portions of the West Bowl area have been extensively logged in the past, we do not anticipate managing those private lands for timber extraction.

B. Old Growth Forest

Old growth forest characteristics have been identified by New Hampshire Natural Heritage Inventory in portions of two areas of Mount Sunapee known as "polygon 23" and "polygon 20". A 1999 report entitled Old Forests and Rare Plants at the Mount Sunapee Ski Lease Area, identified these two old growth forest areas. A more recent study commissioned by DNCR and paid for by Mount Sunapee was completed in 2003. This report entitled, Natural Heritage Inventory of the East Bowl, provides a full documentation of the characteristics and issues involving these two areas.

Consistent with the recommendations of these studies, Mount Sunapee's management approach to these old growth areas has been avoidance. Lift "J" and associated ski trail were approved in the 2000–2004 MDP within a portion of "polygon 23" outside of the area identified as having "old growth characteristics." Mount Sunapee will maintain a 200-foot natural wooded buffer between ski trails and areas within "polygon 23" identified as having "old growth characteristics." Furthermore, Mount Sunapee agreed in 2000 that "polygon 20" would remain in its current state with no new ski trail or lift development.

Mount Sunapee, working cooperatively with the DNCR, agreed to abandon their original expansion plans in the East Bowl and took steps to analyze the capacity of the West Bowl for ski potential. The West Bowl was found to have favorable ski terrain potential. Mount Sunapee is seeking expansion within the West Bowl area to avoid the old growth characteristic areas identified within the East Bowl.

Mount Sunapee commissioned a field review of the forest within the West Bowl by W.D. Countryman and Associates (see Appendix F). Completed in May 2004, the study noted that the private land portions of the West Bowl expansion area have been extensively logged for decades, while the public lands have been left relatively intact. The scientists described the general forest cover as young and relatively sparse.

The Countryman field study did not find any areas of old growth forest or areas with "old growth characteristics." These field results are consistent with the findings outlined in the 1999 study by

New Hampshire Natural Heritage. In that study, they identified polygon five (including portions of the public lands area within the West Bowl) as having "little, if any, clear evidence of old growth" (Old Forests and Rare Plants at the Mount Sunapee Ski Lease Area, page 12).

C. Rare Plant Resource

The New Hampshire Natural Heritage Inventory identified a population of a state-threatened orchid, bog twayblade (*Liparis loeselii*), existing in the Duckling slope below the Spruce Triple Chairlift that is apparently perpetuated "in part by management of the open ski run." The proposed MDP is not expected to affect the population. Additionally, the population will continue to be protected by mowing the trail after mid-August allowing time for flowering and seed dispersal. The population has been inventoried every few years by New Hampshire Natural Heritage.

According to the inventory of Rare Plants, Rare Animals and Exemplary Communities in New Hampshire Towns (updated in July 2013) prepared by the New Hampshire Natural Heritage Bureau, no rare plants are noted within the Town of Goshen.

To better verify this inventory, Mount Sunapee retained W.D. Countryman and Associates to complete a field review. During their two-day field visit in May of 2004, their field ecologist did note only one species of potential concern. According to this study, "One species listed on the New Hampshire Natural Heritage Bureau proposed list of Endangered, Threatened, Watch, Extirpated and Intermediate Plant Species was noted during field work. A single butternut tree (*Juglans cinerea*) occurs on the north side of the existing access road off Brook Road. The area appears to have been an old house site, and there are likely to be additional butternuts nearby. Butternut is of concern because of the threat posed by canker dieback (*Melanconis juglandis*), a widespread fungus disease that weakens and then kills the tree. The tree noted at Brook Road can likely be avoided and therefore not be affected by the project." The summary of this field work can be found in Appendix F.

VIII. Wetlands Impacts

Wetlands at Mount Sunapee are regulated by Local, State and Federal rules. In general, wetlands fall under the jurisdiction of the NHDES and the U.S. Army Corps of Engineers.

West Bowl Expansion

The National Wetlands Inventory mapping (see Figure EMP-2) shows a wetland complex on the western edge of the West Bowl area. This complex is identified as a scrub-shrub/forested wetland.

Pioneer Environmental Associates conducted onsite field investigations in 2001and 2004 confirming this known wetland feature (see Appendix C). These field investigations concentrated their efforts on the lower portions of the mountain, where the majority of potential development impacts could occur.

The wetland scientists concluded that the majority of the West Bowl area has been heavily impacted by logging activities that have continued within the parcel for decades. Hardwood species identified include northern red oak (*Quercus rubra*), American beech (*Fagus grandifolia*) and paper birch (*Betula papyrifera*). In general, the site is comprised mostly of samplings with a limited overstory. The study also noted that the National Resource Conservation Service (NRCS) soils survey for Sullivan County, New Hampshire identified the soils within the site from Mondadock (well-drained) to Lyme-Mooskilauke (somewhat to poorly drained).

The site has several small, unnamed streams and drainages moving downhill. The largest of these was observed to flow toward Brook Road through the known Class II wetland and into the Gunnison Brook south of the site. Along this and other smaller drainages some potential riparian wetlands (forested and scrub-shrub) were noted. Some potential wetland areas were observed within obviously constructed drainage ditches. The quality of these wetlands appears to have been largely influenced by the logging activities of the site.

The Best Management Practices (BMPs) employed by Mount Sunapee rely on two basic techniques: avoidance where possible and minimization of impacts elsewhere. The resort has attempted to minimize wetlands impacts within the existing leasehold. The West Bowl expansion provides Mount Sunapee with a new opportunity to implement our BMPs from the earliest point. As the design phase for improvements move forward within the West Bowl, Mount Sunapee will seek ways to avoid or minimize wetland impacts.

Mount Sunapee will update and complete a more detailed delineation of regulated wetlands within the West Bowl as design plans are refined. Based on our current understanding of the site, and with effective design and use of our BMPs, plans for the West Bowl area can be completed with minimal disruption to natural wetland systems.

IX. Wildlife Habitat Preservation

As identified in the Town of Newbury Master Plan, several important benefits are imparted by wildlife resources as follows:

- *"An abundant and diverse supply of wildlife and plant resources provides opportunities for education, entertainment, leisure, and recreation, including hunting, fishing, photography, bird watching, nature studies, art and similar activities."*
- *"The presence or absence of native wildlife species, sensitive to pollution or loss of habitat, helps to indicate the condition of the natural environment."*
- *"Abundant and healthy wildlife and plant resources help attract visitors and support entertainment, educational and recreational business opportunities."*

Mount Sunapee Resort supports these values and is committed to managing the leased lands in a manner that does not threaten wildlife habitat. This includes not only the protection of habitat, but also the implementation of programs that enhance and educate the public about the resources and the value of their protection.

No critical wildlife habitat has been identified within the confines of the Mount Sunapee Resort lease lands. Per the most recent New Hampshire Fish and Game Department mapping, no deer wintering areas or deer yards were identified within the lease lands. Improvements currently proposed as part of the proposed MDP will not affect any identified critical habitat.

West Bowl Expansion

Both the public and private lands within the proposed West Bowl expansion have also been screened for potential wildlife habitat. No critical wildlife habitat was found in the review of information from the State of New Hampshire (Rare Plants, Rare Animals and Exemplary Communities in New Hampshire Towns, July 2013). A field analysis by W.D. Countryman and Associates, completed in May of 2004, more fully evaluated these issues within the West Bowl area. This study confirmed that the observed wildlife is typical of large wooded tracts within the State of New Hampshire. Evidence of deer and moose was noted during the site walk, most commonly in areas where prior logging had occurred. The field investigators found no evidence of tree scaring by bears, but some potential denning areas were seen at upper elevations along the southern edge of the proposed ski terrain in the West Bowl. The study document can be found in Appendix F.

The field investigation also reviewed the site for the presence of bird species. Due to the timing of the fieldwork, migratory species were not observed in large numbers. The majority of species observed were resident and common to northern hardwood forests. The forests are expected to support a wide variety of both resident and migratory species. Evidence of two twig nests near the Summit Hiking Trail was also noted. These nests were not complete and did not suggest recent use. The field scientists suggest that great blue herons (*Ardea herodias*) were most likely responsible rather than raptor species, due to their position in the canopy. It is noteworthy that these nests were located adjacent to the hiking trail, an area of persistent human presence.

Mount Sunapee is committed to environmental stewardship. We will continue to be vigilante during the implementation of the MDP to address wildlife issues.

X. Scenic and Aesthetic Qualities

The proposed MDP has carefully considered the aesthetic character of Mount Sunapee. Lift and trail improvements are consistent with the existing visual characteristics of the mountain as a ski area. New trail and lift clearing will be performed in a manner that is consistent with the recreation character of the ski area.

Night skiing and lighting was previously approved in the 2000–2004 MPD for the South Peak area, Elliot Slope, Billy Goat (Pipeline), Duckling (Jet Stream), Eggbeater, Upper Flying Goose, Lower Flying Goose, and Lynx trails. Although night skiing has not been implemented since its approval, it remains an option that may be pursued. These trails are low on the mountain, which will minimize off-site lighting impacts.

Mount Sunapee will comply with the design standards for ski slope lighting as established by the Illuminating Engineering Society of North America (IESNA) and the National Ski Area Association (NSAA). Additionally, other design techniques will be employed to limit the off-site visibility of the proposed lighting. These techniques may include:

- Limiting the height of light poles.
- Locating light poles within the tree line and below the forest canopy.
- Light is directed downward and limited above the horizontal by utilizing high cut-off, shielded and louvered luminaires.

Summer Use

The existing and expected uses associated with the Summer Adventure Park are wholly compatible with the aesthetic character of Mount Sunapee as a resort area. Contemporary resorts routinely include activities such as canopy tours, zip lines and similar features which are woven around the natural features of the mountain setting and enhance the public's ability to appreciate the natural beauty of the setting. These features and activities are placed low on the mountain and indiscernible from off-site vantage points.

West Bowl Expansion

The West Bowl expansion presents the opportunity for new recreational skiing terrain at Mount Sunapee which is consistent with the formation and use of Mount Sunapee as a ski area in 1948. Mount Sunapee has always been and will continue to be a leader in alpine skiing recreation in New Hampshire. New architecture and building additions will be designed to be consistent with the recreational and historic character of the region and the surroundings. The use of indigenous materials and colors will be incorporated into new structures.

With the exception of upper lift terminal, new buildings within the West Bowl will be placed on the lower elevation portions of the mountain. This, coupled with appropriate setbacks from Brook Road, will make views of the project very limited in scope and intensity.

As the master plan process continues, Mount Sunapee will address local aesthetic concerns and issues through landscaping and site design.

Night skiing and lighting is not proposed for ski trails in the West Bowl area.

An analysis of potential visibility of the West Bowl area has also been completed. The first step in this process was to determine the general topographic characteristics of the area and define the extent of likely views. This was accomplished by examining the United States Geologic Survey 1:24,000 topographic contour maps of the area surrounding the West Bowl.

Based on this analysis (see Figure EMP-4), we believe that the base area improvements will be seen from very few vantage points. These areas are mostly within the short stretch of Brook Road between NH103 and just south of the site. Even within these areas, the extensive roadside canopy creates effective screening of the project. Other manmade elements, such as those at the Goshen transfer station, are also visible in the foreground within these areas. Photographs from these various vantage points can be found on Figure EMP-5. We also believe that although the proposed ski terrain will likely be visible from a variety of vantage points around the region, they will be viewed at a great distance. In general, the areas to the south and west will have better views of the proposed ski terrain.

Mount Sunapee will work closely with the Sunapee-Kearsage-Ragged Greenway Coalition to address ski trail crossing with the Summit Hiking Trail within the West Bowl. Hikers will be allowed to cross ski trails during the winter ski season.

Mount Sunapee believes that the implementation of the MDP including expansion into the West Bowl area would not create a significant impact to the scenic or aesthetic qualities of the region. Although ski trails and the West Bowl lift may be visible from distant vantage points, these elements are consistent with the scenic context of Mount Sunapee and its role as a winter recreational destination within the region. Base area improvements would be screened from offsite views due to extensive woodland cover and setbacks. Mount Sunapee is also proposing several important mitigation measures for long-term protection of other areas surrounding Mount Sunapee. On balance these measures seem reasonable and consistent with appropriate management of the aesthetic resource.

XI. Archaeological and Historical Resources

Past discussions with the State of New Hampshire Division of Historical Resources (NHDHR) have not identified any known or documented archeological and/or historical resources within the lease lands or within the private lands proposed for the West Bowl expansion. Furthermore, a review of the state and federal register of historic places found no structures designated as historic NHDHR has been asked to comment on the MDP in the past and will be involved, as necessary, in reference to cultural resources.

Figures

Figure 1: Base Map

Figure 2: Resource Map

Figure 3: Watershed Map

Figure 4: Viewshed

Figure 5: Photographs

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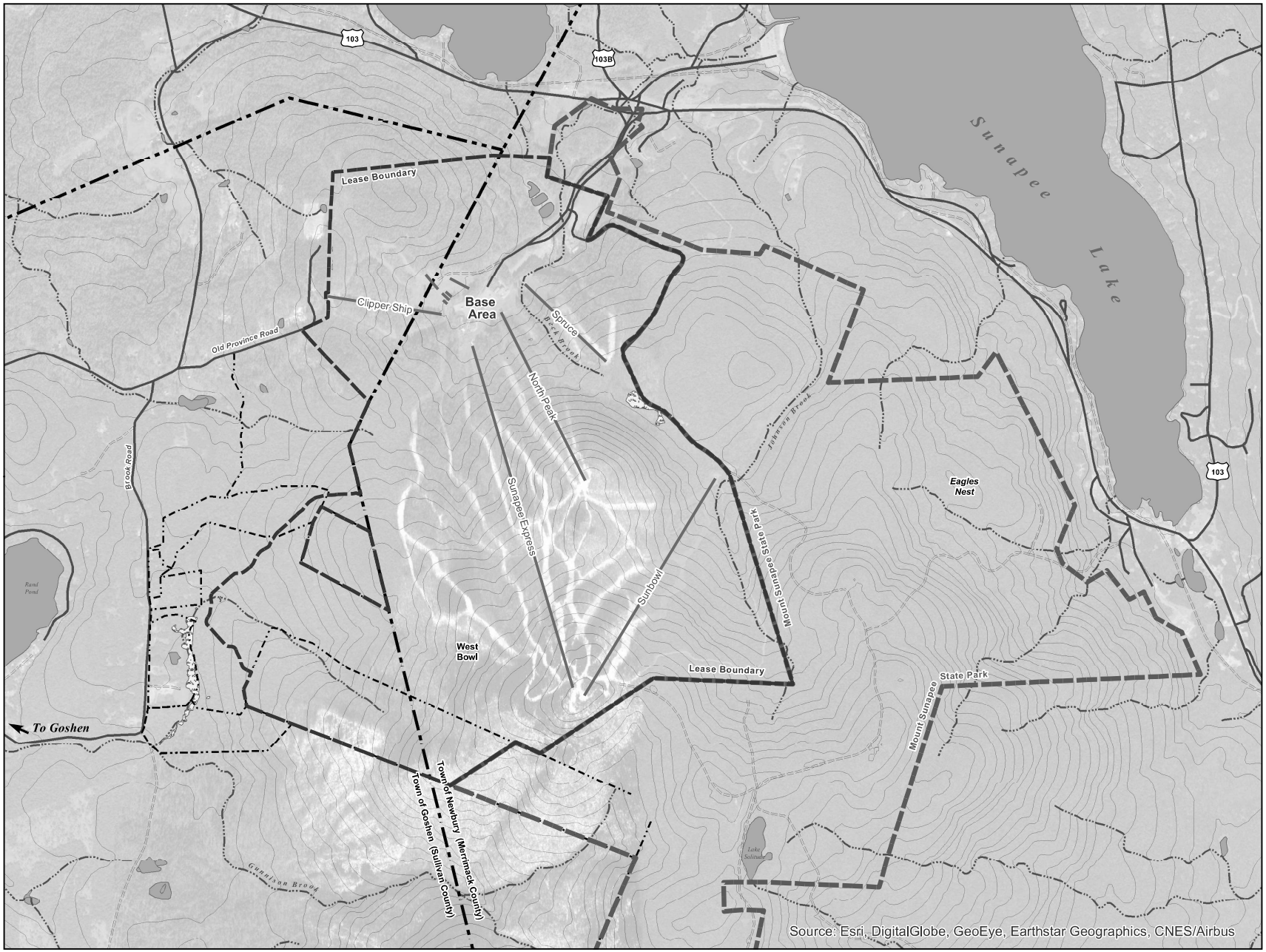


MOUNT SUNAPEE

ENVIRONMENTAL MANAGEMENT PLAN

- Existing Lift
- Proposed Lift
- Existing Trail
- Proposed Trail
- Ski Area Lease Boundary
- State Park Boundary
- Property Line
- Town Boundary
- Road
- Known Wetland
- Water Body
- Stream

SCALE (ft)

0 750 1,500 2,250 3,000

Scale: 1 In = 1,500 Ft
Contour Interval: 50 Ft
Date: June 2020
Drawn By: AE
Checked By: ML
Prepared By:

N

SE GROUP

Title
Base Map

Sheet Number
EMP - 1

Project Number:19112001
File: EMP_1_2



MOUNT SUNAPEE

ENVIRONMENTAL MANAGEMENT PLAN

- Existing Lift
- Proposed Lift
- Existing Trail
- Proposed Trail
- Ski Area Lease Boundary
- State Park Boundary
- Property Line
- Town Boundary
- Road
- Known Wetland
- Water Body
- Stream

Notes:

1. Unnamed drainage within West Bowl Area
2. Known wetland area
3. Confluence of unnamed drainage and Gunnison Brook
4. Beck Brook Drainage
5. Johnson Brook Drainage
6. Gunnison Brook Drainage

SCALE (ft)

0 750 1,500 2,250 3,000

N

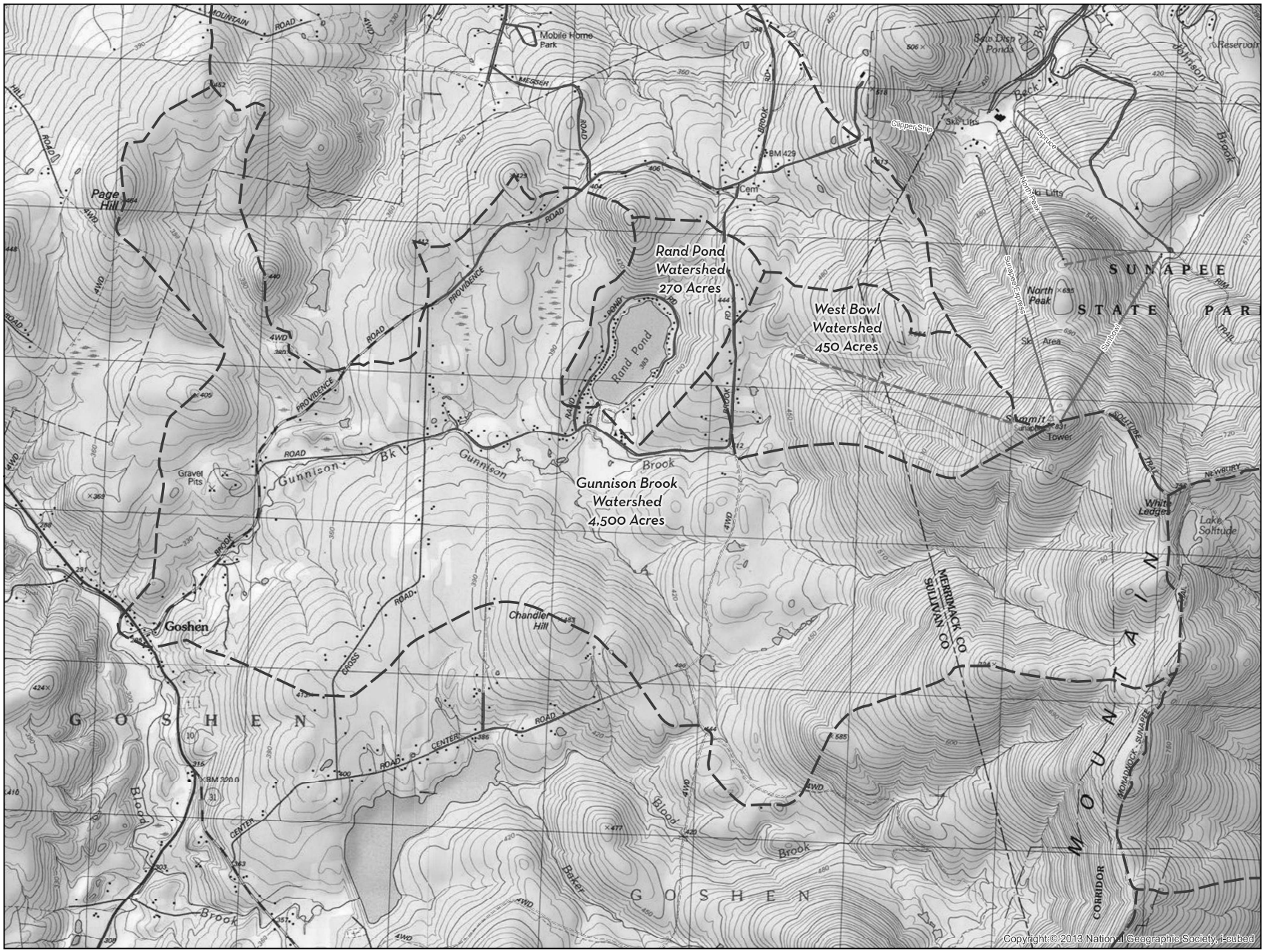
Scale: 1 In = 1,500 Ft
Contour Interval: 50 Ft
Date: June 2020
Drawn By: AE
Checked By: ML
Prepared By:

SE GROUP

Title
Resource Map

Sheet Number
EMP - 2

Project Number:19112001
File: EMP_1_2



MOUNT SUNAPEE

ENVIRONMENTAL MANAGEMENT PLAN

- Existing Lift
- Proposed Lift
- Existing Trail
- Proposed Trail
- Watershed Boundary

SCALE (ft)

0 1,000 2,000 3,000 4,000

N

Scale: 1 In = 2,000 Ft
Date: June 2020
Drawn By: AE
Checked By: ML
Prepared By:

SE GROUP

Title
Watershed Map

Sheet Number
EMP - 3

Project Number:19112001
File: EMP_3



MOUNT SUNAPEE

ENVIRONMENTAL MANAGEMENT PLAN

- Existing Lift
- Proposed Lift
- Existing Trail
- Proposed Trail

1. **View Point #1**
   3.5 miles southwest of Mount Sunapee
2. **View Point #2**
   4.3 miles northwest of Mount Sunapee
3. **View Point #3**
   1.4 miles west of Mount Sunapee
4. **View Point #4**
   6.7 miles north of Mount Sunapee

SCALE (ft)

0 2,500 5,000 7,500 10,000

N

Scale: 1 In = 5,000 Ft
Date: June 2020
Drawn By: AE
Checked By: ML
Prepared By:

SE GROUP

Title
Viewshed

Sheet Number
EMP - 4

Project Number:19112001
File: EMP_4



Viewpoint1: View looking north and east from Lake Gunnison towards Mount Sunapee(left) and the West Bowl Area (left-center).



Viewpoint 2: View looking south and slightly east from Bradford Road near Newbury towards Mount Sunapee and the West Bowl (slightly right of center).



Viewpoint 3: View looking east from Brook Road towards the West Bowl area. Note that the lower elevarions are largely screened by foreground vegetation.



Viewpoint 4: Long-range view looking south and east from Brown Hill area towards Mount Sunapee (right) and the East Bowl / Eagles Nest area (center and left).

MOUNT SUNAPEE

ENVIRONMENTAL MANAGEMENT PLAN

Date: June 2020
Drawn By: ZP
Checked By: ML
Prepared By:

SE GROUP

Title
Photographs

Sheet Number
EMP-5

Project Number: 19112001
File: EMP-5

Appendices

Appendix A. **Mount Sunapee Base Area Well Yield Evaluation**

Appendix B. **Wastewater Facilities Evaluation Report**

Appendix C. **Wetland and Surface Water Delineation Study Reports**

Appendix D. **Mount Sunapee West Bowl Expansion Snowmelt Drainage and Watershed Analysis**

Appendix E. **Traffic Impact and Site Access Study**

Appendix F. **Preliminary Wildlife and Habitat Assessment, Mount Sunapee West Bowl Expansion**

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PIONEER ENVIRONMENTAL ASSOCIATES, LLC.
10 SEYMOUR STREET
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June 18, 1999

Mr. Richard Flanders, Jr.
Water Supply and Pollution Control Division
Department of Environmental Services
64 North Main Street
Concord, New Hampshire 03301

RE: Mt. Sunapee Base Area Well Yield Evaluation
Newbury, New Hampshire

Dear Mr. Flanders:

Pioneer Environmental Associates, LLC. (Pioneer) of Middlebury, Vermont has completed testing associated with the re-evaluation of the yield of the Mt. Sunapee Base Area Well at the ski area at Mt. Sunapee State Park located in Newbury, New Hampshire (see site location map, page 1 of Attachment). In accordance with the June 1997 Design Standards for Small Public Drinking Water Systems (Section Env-Ws 372.14), we performed a 48-hour constant discharge test for this well from May 18 through 20, 1999. In addition to the required pumping test, we have also completed a step-drawdown test at the well on May 17, 1999, and a recovery test following the end of the constant discharge test on May 20, 1999. These additional tasks were performed to provide additional data on the hydraulics of the well and the bedrock aquifer in which the well is completed to help characterize the source capacity of this well. We also collected water samples prior to the end of the 48-hour test for analysis for the constituents listed in Table 372-4 of Env-Ws 372.

In summary, the aquifer testing indicates that, at a minimum, the Mt. Sunapee Base Area Well has a source capacity of 109.6 gallons per minute (gpm), or 157,824 gallons per day (gpd), based on our capacity analysis. As specified in Section Env-Ws 372.11(b), a minimum total source capacity of 1½ times the design flow rate is required for public non-community water systems such as this. A source capacity of 109.6 gpm is adequate to serve a design flow rate of 73.1 gpm, or 105,216 gpd. This exceeds the currently permitted source capacity of 70 gpm which is sufficient to serve a design flow rate of 67,200 gpd. A detailed description of the testing program follows.

INTRODUCTION

The ski area at Mt. Sunapee State Park has historically been operated by the New Hampshire Department of Resources and Economic Development (DRED). However, as of the 1998-99 ski season, the ski area is operated by Okemo Mountain Resort, as Mount Sunapee Resort, through a lease agreement with the State of New Hampshire. Because of improvement plans being implemented at the resort, primarily the construction of the new Sunapee Base Lodge, a re-evaluation of well capacity was requested by the Department of Environmental Services. The water system is a transient non-community system as it serves a transient, rather than residential, population.

The Base Area Well is located near the base of the Duckling chairlift at the Mt. Sunapee Resort (Attachment, page 1). The well is used to meet the water needs of the base area of the resort's facilities. Details of the well are as follows:

- Date Drilled: February 1980
- Drilled By: Gallagher and Philbrick, Concord, NH
- Drilling Method: Pounder/Percussion
- Depth of Well: 244 feet
- Depth to Bedrock: 47 feet
- Casing Length: 63 feet
- Static Level: 10 feet

According to a sanitary survey performed on November 1, 1993 by Mr. Jack Mollica of the Department of Environmental Services Water Supply Engineering Bureau, the Base Area Well has a permitted source capacity of 70 gpm, sufficient to serve a design flow rate of 67,200 gpd. During a previous pumping test performed for this well on June 4-6, 1980, the water level in the well was slowly rising while being pumped at a rate of 70 gpm. This suggests that the capacity of the well is greater than the currently approved 70 gpm. Therefore, this most recent testing was performed to determine the source capacity of the well to a greater degree of accuracy.

WELL TESTING

Testing of the Base Area Well occurred from May 17-20, 1999 and consisted of the following:

- Step-Drawdown Test
- 48-Hour Constant Discharge Test
- Observation Well Monitoring at Shop Well
- Recovery Test
- Collection of Water Quality Samples

The production well data (step-drawdown test, constant discharge test, and recovery test) are presented on pages 2 through 21 of the Attachment. The results and evaluation of the water quantity testing are discussed below.

Step Drawdown Test

A step-drawdown test was performed at the well on May 17, 1999. The purpose of this test was to determine a safe pumping rate for the 48-hour pumping test. Additionally, the step-drawdown test data allows for the development of a head loss equation for the well to determine the components of drawdown in the well attributable to formation (aquifer) drawdown and turbulent (in-well) drawdown.

The step-drawdown test consisted of six 60-minute step performed at mean discharges ranging from 11.5 gpm to 181.2 gpm. At the end of the sixth step, the pump was allowed to run for an additional 38 minutes at which time the water level was 75.62 feet, representing a drawdown of 64.99 feet. Step-drawdown test data are included on pages 2 through 14 of the Attachment.

From the step-drawdown test data, a head loss equation has been derived for the Base Area Well. The head loss equation is as follows:

$$s_w\,(60\text{-}minute) = 0.199Q + 0.000784Q^2$$

where:

s_w = drawdown in production well at a pumping duration of 60 minutes (feet)
Q = pumping rate (gpm)

This equation can be used in conjunction with the 48-hour test constant discharge test data to determine the source capacity of the well. The step-drawdown test analysis is presented on pages 24 through 25 of the Attachment.

Constant Discharge and Recovery Tests

A 48-hour constant discharge test was performed at a mean discharge of 134.4 gpm from May 18-20, 1999 (Attachment, pages 15 through 19). At the conclusion of the 48-hour test, the production well water level was 115.21 feet below top of casing, representing a drawdown of 105.59 feet. A generally linear drawdown curve (on semi-logarithmic data plot) was maintained during the initial 1,000 minutes (16.7 hours) of the test at which time it appears that a discharging boundary within the

bedrock aquifer was encountered. The discharging boundary resulted in the steepening of the drawdown curve, which remained linear on the semi-logarithmic data plot at the steeper slope for the remainder of the test (Attachment, page 17).

Section Env-Ws 372.14(a) indicates that the 48-hour pumping test shall demonstrate stabilized drawdown (less than one inch of drawdown in two hours) for at least the last 12-hours of the test. This criterion was not met during the final 12 hours of the test as the water level was declining at an average rate of approximately 1.9 feet every two hours during this time period. However, the test was shut off at 48 hours for two primary reasons:

1) The testing performed for this well exceeds the requirements of Env-Ws 372 as a step-drawdown test and recovery test were performed to provide additional data concerning the source capacity of the well.

2) This is the main water source for Mt. Sunapee Resort, and it had been disconnected since May 14, 1999 when the temporary test pump was installed to allow for the well testing. A large event (the Mt. Sunapee Bike Race) was scheduled for May 22, 1999 and the permanent pump needed to be reinstalled and the reservoir filled prior to this event to accommodate the anticipated demand.

The testing performed for the Base Area Well provides adequate data to characterize the yield of the well.

Following the constant discharge test, recovery measurements were made at the production well and the maintenance building observation well (Attachment, pages 20 through 23). At the conclusion of 257 minutes of recovery measurements, the water level in the production well was 45.8 feet (drawdown = 36.2 feet) representing a recovery of 66 percent. At this time, the process of removing the temporary test pump and reinstallation of the permanent pump needed to begin to ensure its timely completion.

Observation Well Monitoring

Water level measurements were collected during the testing procedures at the Mt. Sunapee Shop Well located approximately 1,500 feet northeast of the Base Area Well to determine if there were any interference effects between the two wells. Well details for the Shop Well are as follows:

- Date Drilled: May 1985
- Depth of Well: 360 feet
- Depth to Bedrock: 185 feet

- Casing Length: 200 feet
- Static Level: Overflowing (at time of drilling)
- Driller's Yield: 5 gpm

As can be noted on the data plot for the water level data collected at this well (Attachment, pages 22 through 23), the pumping of the Base Area Well does not affect the water level at the Shop Well.

Water Quality Sampling

Water quality samples were collected just prior to the end of the 48-hour constant discharge test to be analyzed for the constituents listed in Table 372-4 of Env-Ws 372. The pH was measured in the field to be 6.98, and the temperature of the discharge water was 9.1ºC. Complete analytical results are included on pages 29 through 30 of the Attachment. The concentrations of all analytes tested for are below the Environmental Protection Agency's Maximum Contaminant Levels. Total Coliform tested as being present; however, the water samples collected represent the raw water quality from the well, and not after treatment prior to distribution. In addition, *E. Coli* was absent in the sample.

CAPACITY ANALYSIS

Section Env-Ws 372.13(c) indicates that the permitted production volume shall not be greater than the source capacity based on a 24-hour period, as defined by the 48-hour constant discharge test. For the purposes of this analysis, the total available head (TAH) in the well is 105.6 feet, as this is the maximum drawdown obtained during the testing.

To determine the source capacity of this well at steady-state conditions, which is what is essentially required by Env-Ws 372 given the stabilization requirement for the pumping test, the capacity analysis for the Base Area Well was performed by modeling the noted discharging boundary using the method developed by Stallman (Ground-Water Hydraulics, 1972). The aquifer coefficients of transmissivity (T) and storativity (S) were calculated from data collected during the 48-hour constant discharge test and recovery test (Attachment, pages 17 through 21). The calculated values are summarized in Table 1.

Table 1: Calculated Aquifer Coefficients from Pumping Well Data

Test	T (ft^2/day)	S (dimensionless)†
48-hr. pumping	215.26	6.41
48-hr. recovery	197.32	---

Table 1: Calculated Aquifer Coefficients from Pumping Well Data		
Test	**T (ft^2/day)**	**S (dimensionless)†**
† S value used in equations to predict long-term drawdown, does not reflect actual aquifer S value		

To accurately model the aquifer behavior during pumping conditions, an aquifer T of 215.26 ft^2/day is used in the calculations to determine the source capacity of the well. As footnoted in Table 1, the calculated S values are not indicative of the actual storativity of the bedrock aquifer. However, the values can be used in the long-term capacity analysis equations to predict the drawdown in the pumping well over long periods of time. Essentially, the aquifer equations define the drawdown curve of the production well and, thus, can be used to predict the long-term drawdown.

The Stallman method is an analysis that models boundaries, either discharging or recharging, that are noted during aquifer tests. The boundary is modeled via a curve matching technique to determine the Stallman constant of proportionality (K). This is illustrated for the Base Area Well on page 18 of the Attachment. A K value of 10 was determined for the Base Area Well. This K value, and the values of T and S determined for the aquifer are used in the equations developed by Stallman to model the behavior of the aquifer under extended pumping conditions. The Stallman equations are presented on pages 27 and 28 of the Attachment.

The well capacity has been evaluated based on a seven day peak demand, to account for the one-week holiday periods during the winter season when the demand will be the greatest. Using the Stallman equations, the calculated source yield using a total available head of 105.9 feet is 109.6 gpm (157,824 gpd) for a continuous seven day pumping period. Therefore, in accordance with Section Env-Ws 372.11(b), a source capacity of 109.6 gpm is adequate to serve a design flow of 73.1 gpm, or 105,216 gpd. Equations used in the capacity analysis are included on page 27 of the Attachment, and calculations specific to the Base Area Well are included on page 28 of the Attachment.

This capacity analysis is very conservative (i.e., results in a low source capacity) because of the assumptions used in performing the analysis. These include:

- A total available head for the well based only on the tested portion of the well bore, ignoring the remaining well bore below this point (approximately 129 feet). In essence, the analysis uses only 45% of the projected total available head. This is extremely conservative given that the well was drilled using a pounder/percussion drilling methodology. The main water bearing fractures in wells of this type are usually at the bottom of the well bore, because additional percussion drilling becomes difficult after a substantial water bearing fracture zone is encountered.

- The continuous pumping for a seven day period at the source capacity, with no recovery or recharge events.

- The 1.5 reduction factor applied to the calculated source capacity to calculate the design flow able to be accommodated by the well.

Therefore, a permitted source capacity of 109.6 gpm is requested for this well. The actual source capacity is likely significantly greater than the requested capacity given the conservative assumptions used in the analysis. The aquifer characteristics noted during the 48-hour constant discharge test indicate that the source capacity may equal or exceed the constant discharge pumping rate of 134.4 gpm.

SANITARY PROTECTIVE AREA

A sanitary protective area has been designated for the Mt. Sunapee Base Area Well in accordance with Section Env-Ws 372.13. In this case, given the requested permitted source capacity of 157,824 gpd, the sanitary protective area is comprised of the area of land encompassed by a circle around the well with a 400-foot radius. This land is entirely included within Mt. Sunapee State Park land and the lease area.

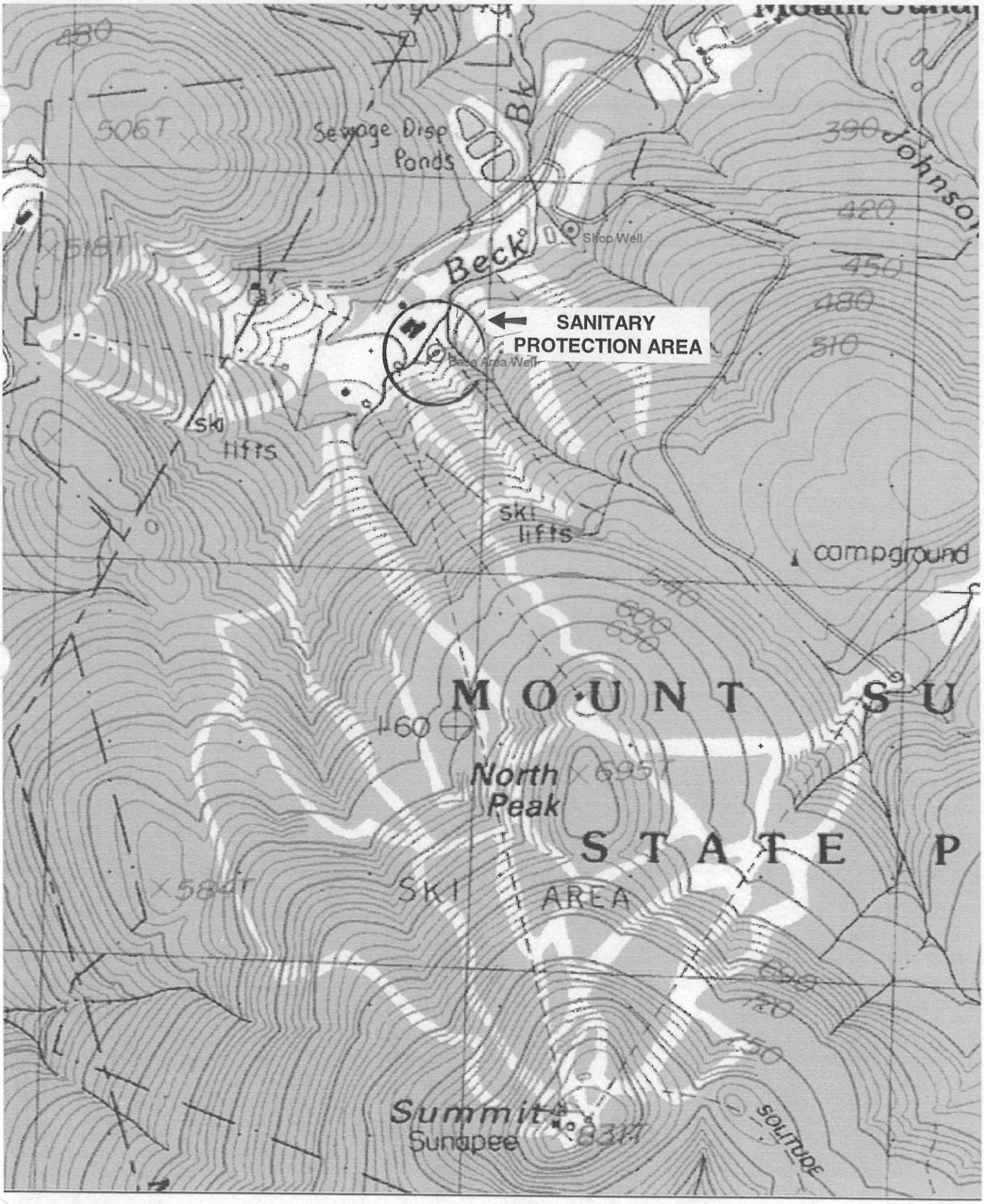
The bottom termini of two chairlifts (Duckling double and North Peak triple) and the Lower Mountain Base Lodge exist within the sanitary protective area. According to Mt. Sunapee Resort personnel, there is no storage of petroleum products or hazardous materials within this area. A large expanse of lawn exists between the well and the North Peak triple chairlift to the west. Given this area's location within the sanitary protective area, no chemical soil fertilization will occur on this lawn area. No wastewater disposal systems are located within the sanitary protective area.

Please call with any questions or comments you may have during your review of this report. I hope to hear from you soon.

Sincerely,

Eric R. Hanson
Senior Hydrogeologist

cc: Tim Drew
Jay Gamble



Name: NEWPORT
Date: 6/4/99
Scale: 1 inch equals 1000 feet

Location: 043° 19' 34.4" N 072° 04' 35.1" W
Caption: Mount Sunapee Resort
Base Area Well Location Map
Newbury, New Hampshire

ENVIRONMENTAL ASSOCIATES, LLC
10 SEYMOUR STREET

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March 12, 2003

Mr. Jay Gamble, General Manager
Mount Sunapee Ski Resort
P.O. Box 2021
Route 103
Newbury, New Hampshire 03255

RE: Wastewater Facilities Evaluation Report

Dear Mr. Gamble

The following letter report constitutes our evaluation of the existing wastewater treatment facilities at the Mount Sunapee Ski Area and its capacity to adequately handle the projected increase in skier visits for the future.

1.0 PROJECT DESCRIPTION

In the summer of 1998, the Mount Sunapee Ski Area was leased to a private ski industry firm, Okemo Mountain Resort. Under the new management, the ski area has incorporated many upgrades to the ski area and to the wastewater treatment system. Based on previous engineering recommendations, they have installed a v-notch weir and ultrasonic meter in the distribution box to measure and record influent lagoon flows. This has allowed for accurate records of flow data during the past five years. Drainage around the lagoons has been improved to reduce the amount of surface run-off that enters the lagoons each year during the spring. This has been accomplished by construction of a berm around the up gradient side of the lagoon and providing a drainage swale to direct run-off from the forested slope around the lagoons. Also, the ski area has made many other improvements to the wastewater systems such as replacing leaky manhole covers with water-tight covers, disconnecting sump pumps from the collection system, and also locating and correcting sources of extraneous inflow and/or infiltration. These changes have improved the operating conditions of the wastewater treatment system considerably since previous evaluations.

Hoyle, Tanner & Associates, Inc. (HTA) has been retained to complete an evaluation of the wastewater treatment and disposal system to determine if the system is capable of handling an increase in skier volumes. Our evaluation includes the review and analysis of the past five years of operating data, including monthly average wastewater influent data, spray application data, skier visits and other data associated with the wastewater facilities. One goal of this study is to evaluate the impact that the various improvements made at the ski area have had on the operations of the wastewater treatment facilities.

Our evaluations include analysis of the lagoons and spray areas. The lagoon evaluation included analysis of meteorological impacts, free board levels and other design factors. Our evaluation focused on the conditions for the last five years. Projected future trends have been evaluated for expected skier visit levels of 275,000, 300,000 and 325,000. The existing wastewater facilities were analyzed to determine their ability to satisfy these anticipated needs. HTA has also reviewed groundwater monitoring reports, and evaluated the overall operation condition of the lagoons and spray areas.

2.0 SKI AREA ATTENDANCE

Ski area attendance is defined as the number of ski tickets sold, ski season pass visits, and employees attending the park during the ski season. Attendance was determined for ski seasons 1998/1999 thru 2001/2002 based on actual recorded data. The current season, 2002/2003, represents accurate data from the ski season opening in November 2002 thru February 2003, and projected data from February 2003 through the end of the season based on historical data. The following table shows the attendance for the past five seasons:

Table 2-1
Annual Ski Season Attendance

	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003*
Ticketed Skier Visits	109,803	131,511	195,237	159,646	194,990
Season Pass Visits	55,516	58,150	62,599	70,542	66,571
Employees	17,200	23,095	30,375	25,625	28,025
Total	**182,519**	**212,756**	**288,211**	**255,813**	**289,586**

*The season 2002/2003 represents actual data (Nov. thru Feb.) and projected data through the end of the season which is based on historical data.

Skier Attendance

Historical records of skier attendance during the ski season are maintained through both the sale of daily lift tickets and season passes. The daily sale of lift tickets was used to determine the daily skier visits at the ski area, and then totalized for the annual skier visits for each of the last five ski seasons. Figures for season pass visits are estimated based on the number of season passes sold and total skier visits. The table above summarizes attendance for the past five ski seasons.

Employees

Employee figures were obtained from the ski area's payroll records. The amount of skiers varies from year to year and also with the length of the ski season. As

attendance increases, so have the employee numbers. Earlier seasons used original figures of 125-225 employees.

3.0 EXISTING WASTEWATER FLOWS

Wastewater inputs to the ski area's treatment and disposal facilities come from several sources, including skiers, summer visitors, and employees. There are also sources that are directly influenced by the local weather conditions, such as infiltration and inflow into the sewage collection system as well as direct precipitation into the lagoons.

Ski-Season Wastewater Flows

To correlate wastewater flows to the attendance at the mountain, wastewater flows to the lagoons during the last five ski seasons were analyzed. Influent flows to the lagoons are measured and recorded by a v-notch weir and ultrasonic meter located in the distribution box. Daily wastewater flows were totalized for each of the past five ski seasons and correlated with the ski season attendance for each ski season to determine a per person wastewater flow rate.

A summary of the total influent wastewater flows per season, the total number of attendance per season, and the corresponding wastewater flow rate in gallons per person are presented in the following table:

Table 3-1
Ski Season Wastewater Data

Ski Season Year	Wastewater Influent (gallons) [1]	Attendance	Wastewater Flowrates (gal/person)
1998-1999	970,417	182,519	5.32
1999-2000	856,522	212,756	4.03
2000-2001	1,010,728	288,211	3.51
2001-2002	765,739	255,813	2.99
2002-2003 [2]	651,973	194,598	3.35

Notes:
[1] Wastewater Influent is the total gallons during the ski season year based on the opening and closing dates of each ski season.
[2] Ski season 2002-2003 data is not complete.

From the last five years of operating data, one can see that the corresponding wastewater flow rate per person has decreased. This is very likely due in part to the implementation of several flow saving measures, such as low flow fixtures, improvements to the collection system, and other improvements aimed at reducing wastewater flows. Based on the available data, Hoyle, Tanner and Associates, Inc.

feels that a 4 gallon per person wastewater flow rate for estimating future ski season wastewater flows is reasonable.

Off-Season Wastewater Flows

For the above wastewater correlation, we did not include summer visitors, summer-time employees, nor summer wastewater flows. However, wastewater flows into the lagoons that occur during the remainder of the year, or "off-season," need to be considered when evaluating the total capacity of the lagoons. For the purpose of determining the off-season wastewater flows into the lagoons, we subtracted the total ski season wastewater flows from the total annual wastewater flows for each of the last five years. The resulting off-season flows are summarized in the following table:

Table 3-2
Off-Seasonal Wastewater Data

Season Year[1]	Annual Wastewater Influent (gallons)	Ski-Season Wastewater Influent (gallons)[2]	Off-Season Wastewater Influent (gallons)
1998-1999	1,494,670	970,417	524,253
1999-2000	1,226,590	856,522	370,068
2000-2001	1,261,832	1,010,728	251,104
2001-2002	1,048,150	765,739	282,411
2002-2003[3]	N/A	651,973	N/A

Notes:
1. The season year is from November thru October.
2. Ski-Season Wastewater Influent is the total gallons during the ski season year based on the opening and closing dates of each ski season.
3. Season 2002-2003 data is not complete.

Infiltration/Inflow

Total inputs into the storage lagoons include inflow and infiltration (I/I) into the sewer collection system. Inflow is defined as extraneous water that enters into a sewer collection system from sources that are directly connected, such as sump pumps, catch basins, manhole covers, and other direct inlets. Infiltration is defined as extraneous water that enters into the sewer system from the ground through sources such as defective pipes, pipe joints, connections and manhole walls. Infiltration is directly influenced by groundwater levels.

In our analysis, I/I is included as a part of the total influent flow measured and summarized in Table 3-1. We have seen from previous studies, that while the system does not appear to have excessive I/I, the collection system does experience a steady nighttime flow, which can be associated with infiltration and/or inflow. For the purpose

of our evaluation, I/I is considered as part of the total wastewater influent amounts on both an annual basis and ski season basis, and is therefore accounted for in the per person wastewater flow rate correlation.

Meteorological Inputs

The meteorological inputs have been examined a number of ways. In our 1999 *Wastewater Lagoon and Spray Irrigation System Phase II Report*, an empirical analysis of using the Thornthwaite method to calculate the evaporation losses from the lagoons and run-of areas was used. This previous report estimated a net total of 2.4 million gallons per year could be expected from meteorological factors.

Another method for estimating the meteorological inputs is to look at historical operating data. The difference between the annual wastewater sprayed (effluent) in the irrigation field and the annual wastewater that flows into the lagoons (influent) can be considered as net annual meteorological inputs to the lagoons. This accounts for precipitation, evaporation losses, and direct run-off into the lagoons. The following table shows the annual meteorological inputs for the seasons of 1998/99 thru 2001/02:

Table 3-3
Meteorological Inputs into Lagoon

Season Year[1]	Annual Influent (gallons)	Annual Effluent (Spray) (gallons)	Meteorological Inputs (gallons)
1998-1999	1,494,670	2,896,971	1,402,301
1999-2000	1,226,590	3,587,830	2,361,240
2000-2001	1,261,832	3,894,900	2,633,068
2001-2002	1,048,150	2,534,200	1,486,050
Average	**1,257,811**	**3,228,475**	**1,970,665**

[1]The season year is from November thru October.

By examining the last four years of operating data, one can seen that the two methodologies result in similar estimates of meteorological input into the lagoons. The 2000/2001 season was an unusually very wet year, whereas, 2001-2002 season was a very dry year. Previously recommended improvements have been made to reduce the runoff that flows into the lagoons from the adjacent hillside. These improvements, together with the historical average of less than 2.0 million gallons, lead us to recommend an allowance of 2.4 million gallons for future meteorological inputs.

Lagoon Capacity

In our *Wastewater Lagoon and Spray Irrigation System Phase II Report, 1999*, the active storage capacity of the lagoons had been estimated to be approximately 5.48 million gallons. This was based on the past operating conditions of maintaining 1' of freeboard and a 1' minimum operating depth. Operator reports have shown that no sludge accumulation occurs in Lagoon #3 nor in Lagoon #2, and little if any in Lagoon #1. Taking this into consideration, it is acceptable to conclude that the active storage space is approximately 5.48 million gallons.

Water level measurements in the lagoons were analyzed for the past four operating years to determine the reasonable operating capacity of the lagoons. Historically, the maximum depths seen in the lagoons occur just before spraying starts. The ski area spray season begins on May 1 which makes this a critical time, and represents the maximum water level depth in the lagoons per year. The maximum water level measured over the past four years occurred on April 27, 2000. This was 65.5 inches, which correlates to a lagoon freeboard of approximately 2.5 feet. This is within the operating parameters of the lagoons.

Groundwater Monitoring Data

Groundwater data from monitoring wells installed down gradient of the lagoon were reviewed and show that there appears to be no evidence of groundwater degradation in the vicinity of the lagoon or spray area.

Spray Season Capacity

The Ski Area is permitted to spray 250,000 gallons per week of lagoon effluent on its spray disposal fields, which consists of approximately 5 acres. Spray application is permitted from May to October or until leaf drop. Spraying is also limited during this period and is not allowed during rain events or when ground water levels are high. Theoretically, there are approximately 24 weeks of available spray season. However, wet weather and high groundwater conditions reduce this by as much as 25 to 30 percent. Based on historical spray data, we would estimate that the annual capacity of the spray area is between 4.2 and 4.5 million gallons per season.

4.0 FUTURE CONDITIONS

This section of the report will focus on projecting wastewater flows for future conditions. Future wastewater flows will be based on projected future trends for expected skier visit levels during the ski season, employee figures, off-season wastewater flows, and meteorological inputs into the lagoons.

Future Skier Attendance

Projections were made for the following three levels of skier visits:

Current:	275,000 skiers
Future:	300,000 skiers
Future:	325,000 skiers

It is assumed that these expected levels of skier attendance include season pass holders.

Future Ski Season Employee Attendance

Employee attendance during the ski season must be included in the wastewater flow projection as well. The average employee attendance per ski season from seasons 00-01 thru 01-02 used in this report was approximately 28,000 employees. The current 2002/2003 season was not included in this average, since the season is not completed. This amount of employees will be added to the projected number of skiers for total ski season attendance figures.

Projected Ski Season Wastewater Flows

To project ski season wastewater flows, we applied a wastewater flow estimate of 4 gallon per person to the total ski season attendance for the different targeted skier visit levels. The resulting ski season wastewater flows are shown in Table 4-1.

Projected Off-Season Wastewater Flows

For the purpose of determining projected off-season wastewater flows, we assumed that current attendance levels and wastewater flows generated during the summer months are going to remain fairly consistent from year to year. Taking the average of these flows from the past three years results in a projected off-season wastewater flow of approximately 300,000 gallons. The past three years are more representative of the actual conditions seen at the treatment facility due to system improvements made after the 1998/1999 season.

Projected Meteorological Inputs

A future projected meteorological input amount of 2,400,000 gallons was used for each targeted skier visit level.

Total Projected Wastewater Flows

The following table shows the total amount of projected wastewater flows for each of the targeted skier visit levels:

Table 4-1
Projected Wastewater Flows

Skier Visits	**275,000**	**300,000**	**325,000**
Ski Season Employees	28,000	28,000	28,000
Total Ski Season Attendance	303,000	328,000	353,000
Ski Season Wastewater Flows @ 4 gal/person (gallons)	1,212,000	1,312,000	1,412,000
Off-Season Wastewater Flows (gallons)	300,000	300,000	300,000
Meteorological Inputs (gallons)	2,400,000	2,400,000	2,400,000
Total Wastewater Flows (gallons)	**3,912,000**	**4,012,000**	**4,112,000**

5.0 ABILITY OF EXISTING WASTEWATER FACILITIES TO MEET FUTURE NEEDS

The existing wastewater treatment system was evaluated to determine its ability to satisfy the projected capacity needs for the projected skier visits.

As discussed previously, review of the lagoon capacity indicates a total usable volume of 5.48 million gallons. In addition, the last several years of operating data indicate that ski seasons ended with an average freeboard condition at the lagoons of approximately 2.5 feet. Therefore, the projected flows should be able to be accommodated in the lagoons. While the capacity requirement of the lagoons is very weather dependent, it appears that there will be adequate storage capacity for the projected wastewater flows associated with the targeted levels of skier visits.

The Ski Area is permitted to spray 250,000 gallons per week of lagoon effluent on its spray disposal fields, which consists of approximately 5 acres. Spray application is permitted from May to October or until leaf drop. Spraying is however, restricted and is not allowed when groundwater levels are high and is further limited by precipitation. Earlier in this report we estimated that the spray area will have an effective spray capacity of between 4.2 and 4.5 million gallons depending on the weather and groundwater conditions.

6.0 CONCLUSIONS

The future projections of skier visits will result in an increase in wastewater flows to the Mount Sunapee Ski Resort's wastewater treatment facilities. Based on the operating data of the past five years, an estimate of 4 gallons per person is appropriate for projecting wastewater flows. The total capacity requirements also include other flow inputs, some of which are very weather dependent. The available data of actual operating conditions support the estimates of future wastewater storage and disposal capacity needs for the future projection levels.

Both the storage and disposal requirements of the Mount Sunapee Ski Resort's wastewater treatment facilities are greatly influenced by the weather. Based on our flow projections, it appears that the existing system will be adequate to handle the increase in capacity associated with the future projected skier visits. While our flow projections take into account meteorological inputs, there is no way of guaranteeing the weather conditions for upcoming years. There is a significant margin of safety in the available storage volume of the lagoons and a smaller, but adequate, margin of safety in the available spray area.

We appreciate the opportunity to provide you with this evaluation. If you have any questions or comments on this report please don't hesitate to call.

Very truly yours,

HOYLE, TANNER & ASSOCIATES, INC.

Eugene J. Forbes, P.E.
Vice President

PIONEER ENVIRONMENTAL ASSOCIATES, LLC.

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MEMORANDUM

To: Jay Gamble
From: Sean W. Donohue
Subject: Wetland and Surface Water Delineation Dodd Johnson Parcel Goshen, New Hampshire
Date: April 19, 2004

Introduction

Pioneer Environmental Associates, LLC. (Pioneer) has completed field delineation of wetlands and surface water features on approximately 15 acres of the subject property (see site location map on page 1 of the Attachment), in the vicinity of the proposed chairlift base station at the request of Mount Sunapee Resort. Field investigation was conducted by Sean Donohue, Wetland Scientist of Pioneer, on September 9, September 10, and October 1, 2003. Wetland determinations were made using the criteria outlined in the United States Army Corps of Engineers (Corps) Wetlands Delineation Manual (Corps 1987). The purpose of the investigation was to identify wetlands and surface water features within the designated portion of the property that are subject to federal and state regulation, for project planning purposes.

Previously, on November 1, 2001 Shelley Gustafson, Senior Wetland Scientist of Pioneer, conducted a preliminary wetland walkover on the entire 130 acre parcel owned

by Dodd Johnson (see cover letter, memorandum, and attachment dated January 25, 2002 summarizing this investigation on pages 2 through 9 of the Attachment). Wetlands delineated by Pioneer in 2003 are primarily associated with the stream identified as "Perennial Stream 1" in the above-referenced memorandum.

The subject property is located in the town of Goshen, New Hampshire, on the east side of Brook Road. To the north, east, and south the property is bordered by forested land. To the west the property is bordered by forested land and private residences located along Brook Road. Delineated wetland and surface water features are shown on the map on page 10 of the Attachment.

Site Description

The property is currently managed as a woodlot, and a network of skidder trails and logging roads are present on the site. The site has been heavily logged, and saplings common to the uplands on the site include *Quercus rubra* (northern red oak), *Fagus grandifolia* (American beech), *Acer saccharum* (sugar maple), and *Betula papyrifera* (paper birch). Other saplings that are also present in the upland vegetation communities include *Prunus virginiana* (chokecherry), *Fraxinus americana* (white ash), and *Acer pennsylvanicum* (striped maple). Larger *Pinus strobus* (white pine) and *Tsuga canadensis* (eastern hemlock) are occasionally present in the sparse overstory, and inclusions of hemlock dominated stands that have not been logged as heavily are also

present. The various wetland communities present on the site are described in the relevant sections below.

Site topography is substantial, with a steady increase in elevation from west to east. Elevation of the project area ranges from approximately 430 feet above sea level at the west end of the property and 570 feet above sea level at the eastern edge of the site, based on United States Geological Survey topographic mapping. The project area lies at the western foot of Mount Sunapee, and is located within the watershed of the ## River.

Soils on the site are primarily composed of ablation and basal glacial till, and generally have textures of sandy loam to loamy sand. The National Resources Conservation Service (NRCS) Soil Survey of Sullivan County, New Hampshire shows soils on the property to be mapped as Mondadnock (well-drained), Monadnock-Hermon association (well-drained to somewhat excessively drained), Marlow (well-drained), and Lyme-Moosilauke loams (somewhat poorly drained to poorly drained) series soils. Field investigation has verified that hydric soil inclusions are present along the riparian corridor within the area of investigation.

National Wetland Inventory (NWI) mapping of the project area shows a wetland complex located at the western edge of the project area (see site location map on page 1 of the Attachment). This complex is identified as a scrub-shrub/forested wetland

feature on the NWI mapping, which is consistent with the observed characteristics of the portion of the wetland that was delineated.

Fourteen wetlands were identified within the area of investigation, and were flagged using pink wetland delineation tape and labeled with the year, wetland number, and flag number (i.e., 2003-1-1). The top of bank of one perennial stream was also flagged. Wetland and top of bank flagging was located by Pioneer using sub-meter Global Positioning System (GPS) and transferred onto the wetland delineation map. The wetlands and surface water features identified in the project area are summarized in Table 1 and discussed in detail below.

Table 1: Summary of Wetland and Surface Water Features

Feature Identification	Jurisdictional Classification	Description
2003-1	Corps/ NHDES	Riparian Fringe Wetland
2003-2	Corps/ NHDES	Forested Riparian Wetland
2003-3	Corps/ NHDES	Forested Riparian Wetland
2003-4	Corps/ NHDES	Riparian Fringe Wetland
2003-5	Corps/ NHDES	Riparian Seepage Wetland
2003-6	Corps/ NHDES	Forested Riparian Wetland
2003-7	Corps/ NHDES	Scrub-Shrub/ Forested Wetland
2003-8	Corps/ NHDES	Emergent/ Scrub-Shrub Wetland
2003-9	Corps/ NHDES	Riparian Fringe Wetland
2003-10	Corps/ NHDES	Disturbed Riparian Wetland
2003-11	Corps/ NHDES	Constructed Riparian Wetland Ditch
2003-12	Corps/ NHDES	Forested Riparian Wetland

Table 1: Summary of Wetland and Surface Water Features		
Feature Identification	Jurisdictional Classification	Description
2003-13	Corps/ NHDES	Riparian Fringe Wetland
2003-14	Corps/ NHDES	Disturbed Forested Riparian Wetland
TB-1	Corps/ NHDES	Perennial Stream

Riparian Wetlands

As indicated in Table 1, twelve riparian wetlands were delineated along the corridor of Stream TB-1. The vegetation communities of these features have been influenced by the previous logging activity on the property, and most exhibit early successional vegetation. All of these wetlands are small in size and occupy riparian terraces, areas of groundwater seepage along the streambank, or the ordinary high water (OHW) of Stream TB-1. Logging disturbance history in the features is variable, ranging from none to evidence of excavation associated with construction of logging trails. Most of the wetlands exhibit some indication of recent logging activity. Some wetland features are located along the fringe of the channel of Stream TB-1 and are dominated by herbaceous growth, while others are forested features along the riparian corridor of Stream TB-1.

Herbs and shrubs typical of these wetlands include *Onoclea sensibilis* (sensitive fern), *Spirea latifolia* (meadowsweet), *Carex crinita* (fringed sedge), and *Impatiens capensis* (jewelweed). Asters and goldenrods are also common in these wetlands and include *Aster novae-angilae* (New England aster), *Solidago canadensis* (Canada goldenrod),

Solidago gramnifolia (grass leaved goldenrod), and *Solidago rugosa* (rough-stemmed goldenrod). *Osmunda cinnamomea* (cinnamon fern), *Thelypteris thelypteroides* (marsh fern), *Carex lurida* (shallow sedge), *Spirea tomentosa* (steeplebush), *Scirpus cyperinus* (woolgrass), and *Rubus allegheniensis* (blackberry) are other herbs and shrubs that are present in some of these wetland features, but not as common.

Betula alleghaniensis (yellow birch) and *Acer rubrum* (red maple) saplings are very common to these riparian wetlands. Striped maple, hemlock, and other saplings more typical of the uplands on the site are present but less prevalent. Presence of woody vegetation varies between wetlands and is primarily a function of the extent of previous logging activity and successional phase. As with adjacent uplands, large overstory trees are less common. Some features are almost entirely devoid of woody vegetation while others have a dense sapling layer. In certain upland areas with non-hydric soils, hydrophytes that also function as aggressive post-disturbance colonizers are present in the species composition. Photographs 1, 2, and 3 on pages 11 and 12 of the Attachment depict selected riparian wetlands and adjacent uplands on the property.

The soils along the riparian corridor tend to exhibit horizons and profile development that have been influenced by depositional processes associated with Stream TB-1. Soil profiles often exhibit a sandy loam A horizon underlain by a horizon of sandy parent material. In wetland areas the A horizon exhibits a dark color (black or dark brown), and the underlying horizon exhibits a gray color, often with redoximorphic features. Soils in upland portions of the riparian corridor lack dark A horizons and/or are not underlain by

horizons exhibiting redoximorphic features that suggest soil saturation within one foot of the surface for significant durations during the growing season. At the location of skidder roads and stream crossings, the upper part of the soil profile has been significantly altered, and constructed drainage ditches are evident in some areas.

At the time of field investigation, wetland hydrology in these riparian wetland features was evidenced by active groundwater seepage, soil saturation within one foot of the surface, and/or drainage patterns within the wetland boundary.

The Highway Methodology of the United States Army Corps of Engineers (Highway Methodology) for wetland evaluation identifies 13 different ecological, social, and economic functions provided by wetlands, which can be utilized as a framework for conducting wetland functional assessments. As summarized in Table 2, the riparian wetlands that have been delineated on the property may contribute to the following wetland functions and values within the landscape:

- floodflow alteration
- groundwater discharge and recharge
- retention of sediment and pollutants
- nutrient removal
- sediment/streambank stabilization

In addition, smaller species of wildlife may utilize the riparian corridor in which these features are located as a protected travel corridor.

Table 2: Matrix Summary of Wetland Functions

Wetland Unit	Groundwater Discharge/ Recharge	Sediment/ Toxicant/ Pathogen Retention	Nutrient Removal	Floodflow Alteration	Sediment/ Streambank Stabilization
2003-1					
2003-2	*	*	*	*	*
2003-3	*	*	*	*	*
2003-4	*	*	*	*	*
2003-5	*		*		
2003-6	*	*	*	*	*
2003-9	*		*		
2003-10	*	*	*	*	
2003-11					
2003-12	*	*	*	*	*
2003-13	*		*		*
2003-14	*	*	*	*	*

* = Function associated with a given wetland

Scrub-Shrub/ Forested Wetland Complex

Wetland 2003-7 consists of a scrub-shrub/forested wetland complex that is identified on NWI mapping. Stream TB-1 also drains into and runs through Wetland 2003-7. *Salix sp.* (willow), *Alnus rugosa* (speckled alder), goldenrods, asters, meadowsweet, *Populus tremuloides* (quaking aspen), and sedges are common to the portion of the wetland that was delineated. Red maple and white ash with shallow root systems are also present.

Along the periphery of the wetlands sensitive fern, cinnamon fern, and *Osmunda regalis* (royal fern) are also present. Adjacent upland communities are typical of the site.

Wetland soil profiles along the delineated boundary tend to exhibit a brown, fine sandy loam A horizon that is friable, and depleted B horizons or B horizons with depletions grading into a depleted matrix color within 20 inches of the surface. However, other areas of the wetland have a dark, thick A horizon underlain by a sandy horizon with a gray color and redoximorphic concentrations and depletions.

Data plots from Wetland 2003-7 and adjacent uplands are included on pages 13 to 16 of the Attachment. In addition, Photographs 4 and 5 on pages 12 and 17 of the Attachment depict these wetland and upland data plots.

Based on functions listed in the Highway Methodology, Wetland 2003-7 has the potential to contribute to the following wetland functions and values:

- floodflow alteration
- groundwater recharge/discharge
- retention of sediment, nutrients and pollutants
- production export (for wildlife)
- sediment/streambank stabilization
- wildlife habitat
- aesthetics

Scrub-Shrub/ Emergent Wetlands

Wetland 2003-8 is a scrub-shrub/emergent wetland located on the north side of the existing unpaved access road. Wetland 2003-7 and Wetland 2003-8 appear to have been contiguous prior to construction of the road, and still share a hydrologic connection via a 12 inch diameter metal culvert.

Meadowsweet, fringed sedge, jewelweed, New England aster, goldenrods, sensitive fern, and speckled alder are common to Wetland 2003-8. Adjacent uplands are typical of the site.

The soil profile is composed of a dark olive-gray A horizon with pieces of undecomposed organic material and oxidized rhizospheres, that is underlain by a depleted B horizon within 12 inches of the surface. The soil texture is fine sandy loam that is friable in the A horizon and firm in the B horizon. Free water was observed at two inches below grade at the time of field investigation. Although a significant amount of surface and subsurface water movement appears to occur in Wetland 2003-8, a stream with a defined channel is not present in the delineated portion of the wetland. The wetland boundary extends beyond the delineated area.

A small constructed ditch on the north edge of the existing access road drains into and is contiguous to Wetland 2003-8. The ditch contains hydric soils, and vegetation within the ditch is similar to Wetland 2003-8. The average width of the ditch is three feet.

Based on the functions listed in the Highway Methodology the delineated portion of Wetland 2003-8 may contribute to the following wetland functions and values:

- floodflow alteration
- groundwater recharge/discharge
- retention of sediment, nutrients and pollutants
- production export (for wildlife)
- wildlife habitat

Streams

The top of bank of a perennial stream identified as TB-1 was delineated on the property. The stream channel consists of sand, gravel, and small stones and exhibits an average OHW of 9 feet. However, the OHW width was observed to range from 6 to 15 feet. In a few areas where the stream channel widens and becomes less deep, small sedge dominated wetlands are confined within the defined stream channel and OHW, and were, therefore, not delineated. At other locations "overflow" channels and upland islands situated where the stream channel temporarily splits are included within the delineated top of bank. Water flow was present at the time of field investigation. The channel is incised in some areas, and the bank is also undercut in a few locations. The bank topography ranges from short, steep gullies to flat stream terraces. Vegetation along the TB-1 corridor is consistent with the previously described upland and wetland

communities. Photograph 6 on page 17 of the Attachment depicts the channel of Stream TB-1 at the location of Wetland 2003-3.

Conclusions and Recommendations

All delineated wetlands and surface waters on the property fall under the jurisdiction of the New Hampshire Department of Environmental Services (NHDES) and the Corps. With regard to wetlands and surface water permitting, avoidance and minimization of impacts to the extent practicable for any proposed project will be required in the project permitting process.

As stated in the introduction to this memorandum, Pioneer's 2003 wetland investigation was limited to an area of approximately 15 acres in the vicinity of the proposed chair lift base station. Pioneer recommends that the remainder of the project area be comprehensively surveyed for wetlands in the growing season of 2004. Delineation of all jurisdictional wetland boundaries and surface waters in these areas would be required during regulatory review of any proposed project.

However, using the mapping and findings of Pioneer's 2003 wetland delineations in conjunction with Pioneer's 2001 site walkover would provide sufficient information for preliminary project planning purposes, and for initiation of avoidance and minimization of wetland impacts.

REFERENCE

Corps 1987. Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. 1987.

Highway Methodology Workbook 1987. U.S. Army Corps of Engineers. 1987. "The Highway Methodology Workbook – Integrating Corps Section 404 Permit Requirements with Highway Planning and Engineering and NEPA EIS Process."

PIONEER ENVIRONMENTAL ASSOCIATES, LLC.

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MEMORANDUM

To: **Sunapee/Additional Parcel File**
From: **Shelley E. Gustafson**
Subject: **Wetlands and Streams Reconnaissance**
Date: **January 25, 2002**

In November of 2001, Shelley E. Gustafson of Pioneer Environmental Associates, LLC. (Pioneer) conducted a site reconnaissance for wetlands and streams on three separate parcels located near the Mount Sunapee Resort in Goshen, New Hampshire (see site location map on page 1 of Attachment). The largest of the three properties is a 130-acre parcel currently owned by Dodd Johnson and surveyed on November 1, 2001. The remaining two properties are 35.5 acres and 9 acres, owned by Lamb and Dodd Johnson, respectively. These parcels were surveyed on November 12, 2001. All three parcels are situated between the Mount Sunapee Resort area and Brook Road.

Dodd Johnson Parcel – 130 Acres

The 130-acre parcel owned by Dodd Johnson can be accessed from Brook Road via an existing logging road. The parcel as a whole has been heavily impacted by recent logging efforts evidenced by the predominance of young, regenerating forest and myriad cleared, access roads. In general, the vegetation throughout the parcel is indicative of upland communities. The most common sapling species found throughout these young woods include *Betula papyrifera* (paper birch), *Fagus grandifolia* (American beech), *Acer saccharum* (sugar maple) and *Quercus rubra* (red oak). Larger individuals

of *Tsuga canadensis* (hemlock) and *Pinus strobus* (white pine) are also found sparsely throughout the canopy.

Three distinct surface water features were identified during the course of the site walkover. First, a perennial stream bisects the property from an east to west direction (see "Perennial Stream 1" on Dodd Johnson Parcel map, page 2 of Attachment). Patches of riparian wetland can be found along its stream course, dominated by hydrophtyic vegetation species including *Carex sp.* (sedge) and *Spiraea sp.* (steeplebush). However, much of its course is bordered by upland, with hemlock in the canopy and upland ferns dominating the herbaceous understory. The stream also contains sections of eroded banks, most likely the result of heavy logging activities nearby. If this parcel were to be developed, Pioneer recommends maintaining a substantial buffer area of at least 100 feet around the stream to avoid impacting wetland areas and further degradation of the stream course.

The second surface water feature is associated with another perennial stream located along the northwest edge of the property (see "Perennial Stream 2" on Dodd Johnson Parcel map, page 2 of Attachment). This stream is contained within a steep ravine that would likely be avoided during development activities. Nonetheless, Pioneer recommends maintaining a 100-foot buffer around this feature as well.

The third feature corresponds to the first perennial stream's course after it bears to the south and follows along the southwest edge of the property. At this location, the stream is interconnected with an extensive wetland complex (see "Wetland/Stream Complex on Dodd Johnson Parcel map, page 2 of Attachment). The boundary of this stream/wetland complex is abruptly marked by a steep change in slope, the upland edge of which is characterized by white pine and hemlock in the canopy. Abundant wildlife sign was noted throughout the forest along the wetland boundary. Pioneer also recommends 100 feet of buffer along this boundary so that wildlife corridor activity can be maintained and protected.

Lamb Parcel

The Lamb parcel is located just north of the 130-acre Dodd Johnson parcel. Although evidence of recent logging was not as obvious in this parcel, the forest was relatively young and contained abundant paper birch in the understory, indicating recent disturbance. Additional common tree species found within this parcel included hemlock and white pine in the canopy with beech and red oak common in the understory. Forest composition was generally indicative of upland conditions within this parcel.

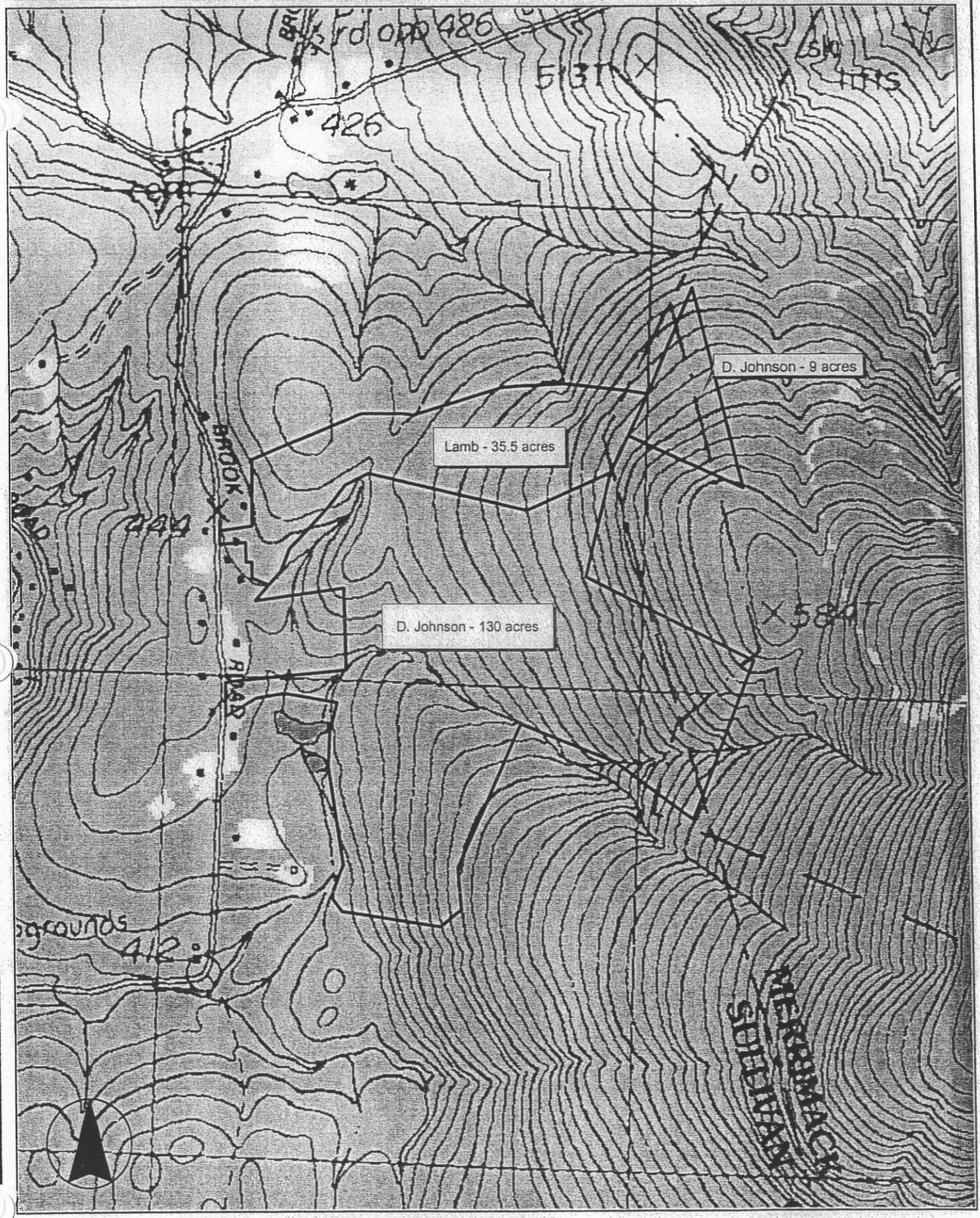
One basin-like wetland was located in the middle section of the parcel, near the saddle depicted on the USGS topographic quad (see "Wetland 1" on Lamb Parcel map, page 3 of Attachment). This roughly 4,000 square foot area was dominated by sedge, steeplebush, *Juncus sp.* (rush), and paper birch. Although no surface water was present on the day of the site walkover, this feature was characteristic of a vernal pool during the dry season. Care should be taken to avoid impact to this feature and the adjacent upland forest.

Additional surface water features located on site include two intermittent stream channels that lead to the north and beyond the property limits (see "Intermittent Stream 1 and 2" on Lamb Parcel map, page 3 of Attachment). Neither channel was flowing on the day of the delineation. Pioneer recommends maintaining a 50-foot buffer around both of these streams.

Dodd Johnson Parcel – 9 Acres

The 9-acre Dodd Johnson parcel is located to the east of the Lamb parcel and 1,660 feet above sea level. Steep slopes and exposed bedrock are predominant landscape features on this parcel. *Picea rubens* (red spruce) and *Abies balsamea* (balsam fir) dominate the canopy. No distinct surface water features were identified on the day of the site walkover.

ATTACHMENT



Mt. Sunapee Resort/Additional Parcel Investigation
Site Location Map
Goshen, New Hampshire

Property Boundaries

12/05/01

Source: USGS Topogr. Quad and Town of Goshen Tax Mapping

900 0 900 1800 Feet

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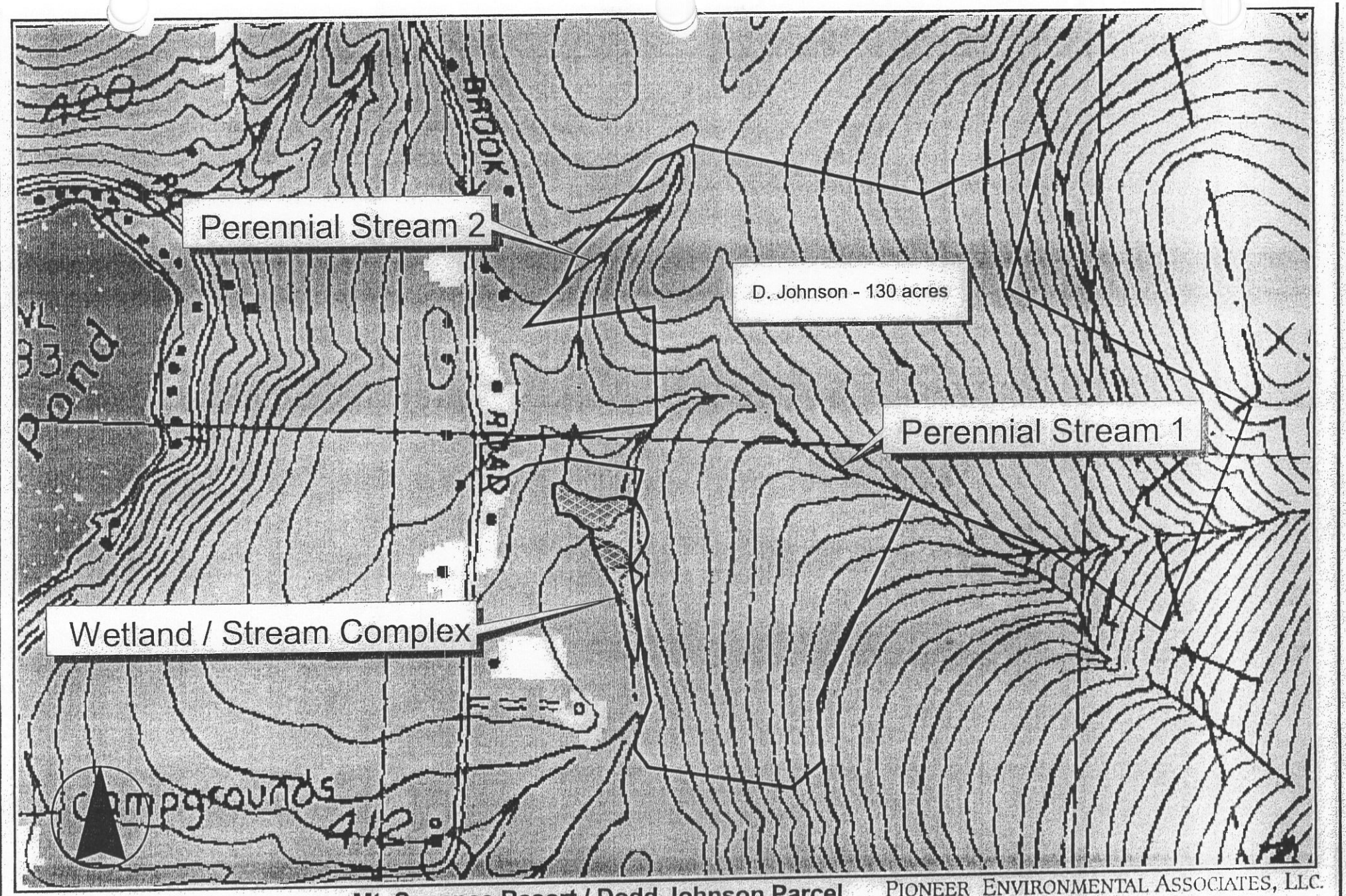

Legend

D. Johnson Property Boundary
Wetland complex.shp

January 9, 2002

Source: USGS Topogr. Quad and Town of Goshen Tax Mapping

Mt. Sunapee Resort / Dodd Johnson Parcel

Wetlands and Surface Water Features

Goshen, New Hampshire

2000 0 2000 4000 Feet

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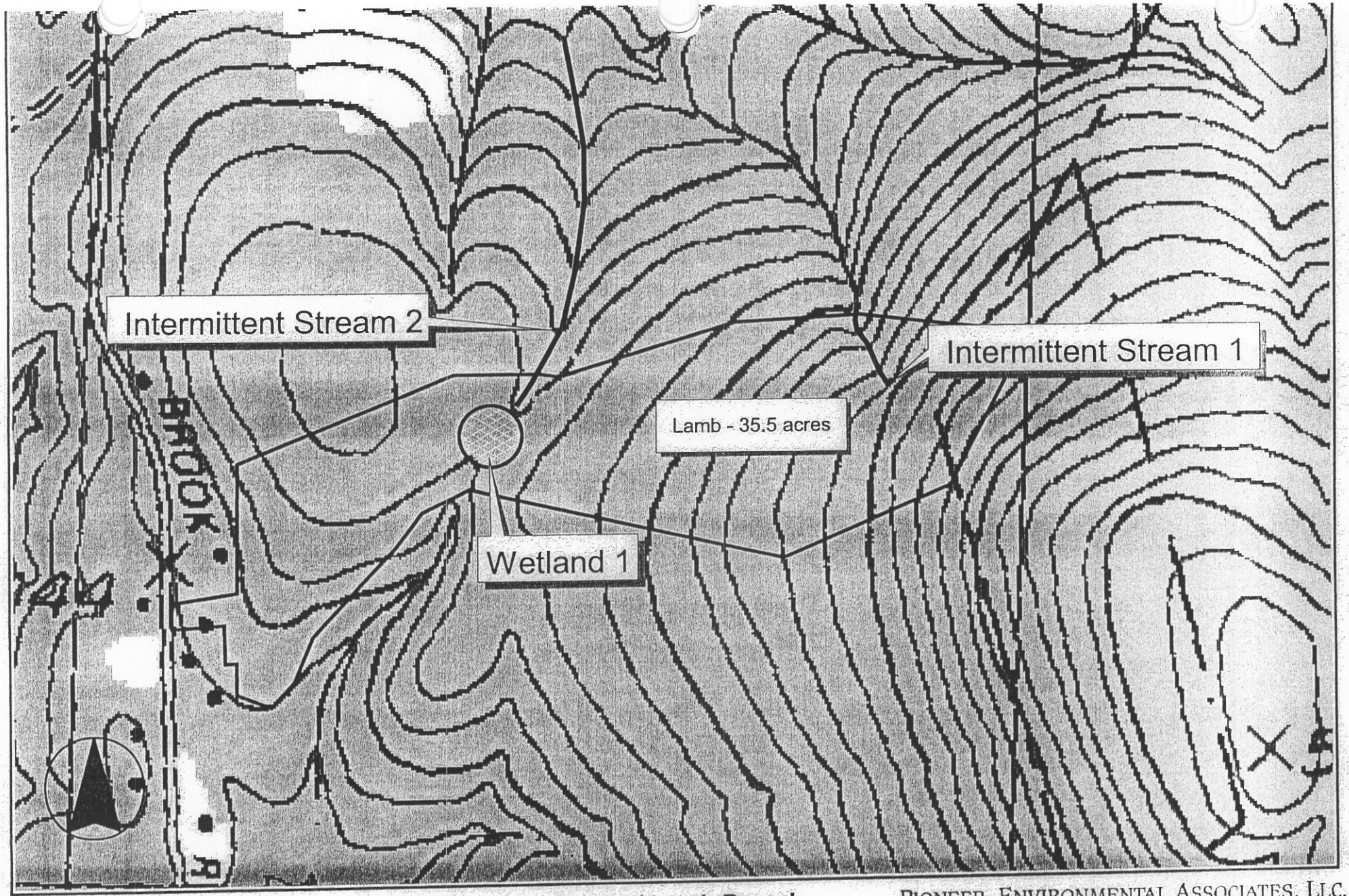

Legend

- Wetland 1
- Lamb Property Boundary

January 9, 2002

Source: USGS Topogr. Quad and Town of Goshen Tax Mapping

Mt. Sunapee Resort / Lamb Parcel

Wetlands and Surface Water Features

Goshen, New Hampshire

1500 0 1500 3000 Feet

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C I V I L E N G I N E E R S • L A N D S U R V E Y O R S

Bruno Associates

P O S T O F F I C E B O X 3 8 7 • W O O D S T O C K • V E R M O N T 0 5 0 9 1
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MEMORANDUM

To: Jay Gamble

From: Nicole Kesselring, PE NSK

Re: Mount Sunapee Resort West Bowl Expansion
Snowmelt Drainage and Watershed Analysis

Date: 5/27/04

In response to our meeting on May 3, 2004, regarding the above mentioned project, our office has performed a hydrologic study to examine the potential impact snowmaking operations could have on The Gunnison Brook, Lake Gunnison and Rand Pond.

During that meeting you conveyed the concerns of some Goshen Citizens regarding:

- Potential impact to the water quality and quantity of Lake Gunnison, also known as the Goshen Ocean,
- Potential impact to the water quality and quantity of Rand Pond, and
- The potential for flooding and washout along Brook Road.

As part of this study, we performed a field visit to each of the water bodies, and examining all culverts and bridges on the Gunnison Brook along Brook Rd. Further information was gathered through the use of USGS Maps, the FEMA Flood Insurance Study for Newport, NH (none is currently available for Goshen), FEMA Flood Insurance Maps for Goshen, and a phone conversation with Alan Hanscom of the NH DOT.

We feel that the following study will provide information which will demonstrate that the work proposed by Mt. Sunapee in the West Bowl Area will not adversely impact the Gunnison Brook Watershed.

Per our conversation, you stated that Mt. Sunapee proposes to make snow on 75 Ac of proposed trails in the West Bowl. 2 ½ feet of snow is typically made over each Ac, at a volume of 180,000 gallons per ac-ft of snow. This means that the entire volume of water proposed for snowmaking in this area will be approximately 33.75 million gallons of water.

The West Bowl area lies on the western slope of Mt. Sunapee within the Gunnison Brook Watershed. This watershed is comprised of 4,500 Ac to the point where the Gunnison Brook crosses under Rt. 10. The West Bowl area drains to an unnamed tributary on the eastern side of Brook Rd., which then discharges into the Gunnison Brook near the 90° corner in Brook Rd.(Merrill's corner). From this point the Gunnison Brook follows

JOHN BRUNO BRUCE BOEDTKER
Registered Engineer • Vermont, Connecticut, New Hampshire, New York, Massachusetts
Registered Land Surveyor • Vermont and New Hampshire

Brook Rd. its entire length, and crosses Rt. 10 prior to discharging into the South Branch of the Sugar River. See Exhibit 1.

Lake Gunnison: Lake Gunnison, also know as the Goshen Ocean, lies within the Sugar River Watershed area, on Blood Brook. The Blood Brook was dammed in this part of the valley to create the lake. Although Gunnison Brook and Lake Gunnison both lie within the Sugar River Watershed, Lake Gunnison is fed by Blood Brook, and is not hydraulically connected to Gunnison Brook. Chandler Hill and other mountain peaks create a drainage divide between the Gunnison Brook and Blood Brook, separating these two watersheds. Waters from these two brooks meet in Goshen, across Rt. 10 from Brook Rd., where the South Branch of the Sugar River begins.

Due to the hydraulic separation of the lake from Gunnison Brook, there is no potential for the lakes water level or water quality to be affected by snowmelt from the proposed trails within Mt. Sunapee Resort's West Bowl Area.

Rand Pond: Rand Pond lies within the Gunnison Brook Watershed. The pond's watershed area is approximately 270 Ac, and does not receive any runoff from the Mt. Sunapee West Bowl area. Rand Pond is fed by numerous tributaries, and it outflows drain into the Gunnison Brook. Due to the fact that the pond is located hydraulically upgradient of the Gunnison Brook, its inflows and water quality will not in any way be affected by snowmaking in the West Bowl area.

Bridges and Culverts along Brook Rd.: To assess the potential impact that snowmaking melt waters could have on the Gunnison Brook watershed a number of factors were examined.

First the snowmelt water quantity in relation to storm runoff from the entire watershed was examined. Based on The FEMA Flood Insurance Study for Newport, since none is available for Goshen, a discharge per square mile of watershed was calculated. This discharge was then applied to the Gunnison Brook Watershed area which is comprised of 7 Ac to arrive at stream flows for Gunnison Brook. These flows can be viewed in Table 1.

Table 1: Watershed Flow Data

S. Branch Sugar River @ Coon Brook Rd.				Gunnison Brook Watershed	
Storm Event (yr)	Stream Flow (cfs) *	Drainage Area (sq. miles)	Discharge per sq. mi (cfs)	Drainage Area (sq. miles)	Stream Flow (cfs) *
10	1,290	26.5	49	7	341
50	1,860	26.5	70	7	491
100	2,120	26.5	80	7	560

(Please note that due to the fact that peak flows for Gunnison Brook Watershed were calculated based on a much larger drainage area, that for a portion of the South Branch of the Sugar River, the actual peak flows out of the Gunnison Brook Watershed is most likely greater than the numbers represented in the table.)

Once the storm event streamflow for Gunnison Brook Watershed was calculated, we determined what percentage of total flow the snowmelt water from the West Bowl area will be. Snowmelt occurs at the end of the ski season as daily temperatures slowly rise. In any given year, snow can usually be seen left on the mountain in excess of 4 weeks after the mountain has closed. Taking into considering that when the mountain closes, melt has most likely already been occurring for up to 4 weeks, it would be reasonable assumed that snowmelt off the mountain actually occurs over an 8 week period of time. To be conservative, our calculations used a 7 day and 30 day melt period to determine what percentage of streamflow these quantities would represent. A 7 day melt time is unrealistic, but it puts into perspective the flow quantities we are dealing with.

As can be seen in Table 2, if melt were to occur over 7 days, snowmelt runoff would represent 2.2% of streamflow for a 10 year storm event and 1.3% of streamflow for a 100 year storm event. Similarly, runoff from a 30 day melt period would represent 0.5% to 0.3 % for a 10 and 100 year storm, respectively. As these calculations show, the snowmelt runoff, will represent such a small quantity of total flow, that it should not create an adverse impact.

Table 2: Snowmelt runoff as a % of Streamflow

Gunnison Brook Watershed		Snowmelt runoff as % of Streamflow	
Storm Event (yr)	Stream Flow (cfs) *	7 day melt (7.46cfs) (%)	30 day melt (1.74 cfs) (%)
10	341	2.2	0.5
50	491	1.5	0.4
100	560	1.3	0.3

Bridges and culverts along Brook Road were examined as part of this study. Our site visit revealed 4 driveway and class 4 road bridges, 2 culvert crossings, and 3 bridge crossings for Brook Rd. As Brook Rd. is a state road, bridges on this road are designed to the flood of record or the 50 year storm event, which ever is greater. All the bridges viewed appeared to be in good condition, with adequate clearance to pass large storm events. The two culverts under Cross Rd. appear to each be 68" diameter steel culverts, and appear to be in good condition. A single 60" culvert under a farm road, just east of the Province Rd./Brook Rd. intersection

was severely clogged with branches and debris, thereby decreasing its capacity. The area in which this culvert is located is shown as flood plain on the FEMA Flood Maps, so it is likely, that flooding occurs in this area in the spring time. It did not appear that the crossing is used for more than access to fields on the other side of the brook.

Alan Hanscom of the NH DOT was also contacted to determine if he was aware of any problems in this area. He stated that from time to time road shoulder maintenance is necessary due to washout out from some larger storm events, where the brook comes very close to the road. He was unaware of any bridge issues along Gunnison Brook.

Storm event runoff from the proposed trails is expected to be negligible in terms of the overall watershed area, since no impervious area will be created, and the infiltration characteristics of the land will remain substantially the same.

In summary, Lake Gunnison and Rand Pond will be completely unaffected by any increase in snowmelt from the West Bowl area because they are hydraulically disconnected. The increase in flow that will be realized by the Gunnison Brook during spring melt is a very small percentage of its storm event flow and is unlikely to create a noticeable impact at any bridges or culvert crossings. Based on the above discussion, it is my professional opinion that there will not be any adverse impact from the increase in snowmelt created by the proposed West Bowl area.

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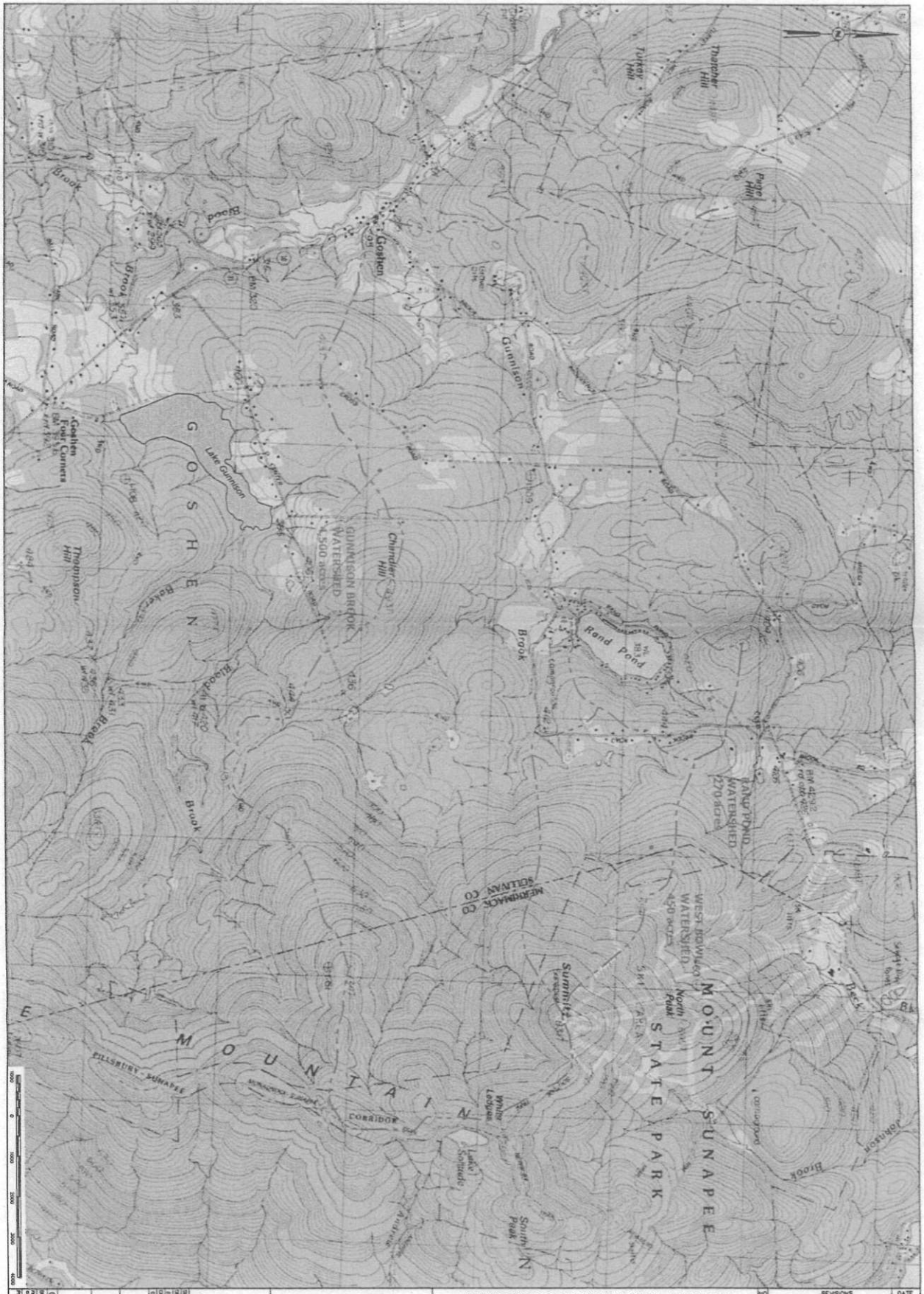


DRAWN: JWK CHECKED: BMB DATE: 5/27/04 MOUNT SUNAPEE WATERSHED AREA MAP EX-1 © 2004 BRUNO ASSOCIATES INC., P.C. FILE: 03022-EX1 PROJECT: 03022	BRUNO ASSOCIATES INC. P.C. ENGINEERS, PLANNERS, SURVEYORS PO BOX 387, THE MILL BUILDING WOODSTOCK, VERMONT 05091 PHONE: (802) 457-3580 FAX: (802) 457-4853	GUNNISON BROOK WATERSHED AREA MAP FOR MOUNT SUNAPEE RESORT IN GOSHEN & SUNAPEE NEW HAMPSHIRE	NO. REVISIONS DATE

West Bowl Area Fact Sheet

Gunnison Brook Watershed Area = **4,500 Ac**

Gunnison Brook has it headwaters at the top of Mt. Sunapee, and follows Brook Road down to Rt. 10. Shortly after it crosses under Rt. 10 it converges with the South Branch of the Sugar River.

Snowmelt in West Bowl Area
Proposed snowmaking trail area = **75 Ac**

Trail area = **1.67 % of Watershed**

Snow making snow quantity= **180,000 gal/ac-ft**

snow making snow depth = **2.5 ft**

Total snowmaking snow quantity = **33,750,000 gal = 4,512,032 cf**

Hypothetically, If entire snowmaking quantity melted over: **7 days**

runoff to Gunnison Brook would be: **7.46 cfs**

Hypothetically, If entire snowmaking quantity melted over: **30 days**

runoff to Gunnison Brook would be: **1.74 cfs**

In reality snow on mountain melts over a period of 4 - 6 weeks after Mt. Sunapee has closed. (runoff from melt begins prior to the mountain closing)

Gunnison Brook Watershed			Snowmelt runoff as % of Streamflow	
Storm Event (yr)	Drainage Area (sq. miles)	Stream Flow (cfs) *	7 day melt (7.46cfs) (%)	30 day melt (1.74 cfs) (%)
10	7	341	2.2	0.5
50	7	491	1.5	0.4
100	7	560	1.3	0.3

FEMA, Flood Insurance Study, Newport, NH

S. Branch Sugar River @ Coon Brook Rd.				Gunnison Brook Watershed	
Storm Event (yr)	Stream Flow (cfs) *	Drainage Area (sq. miles)	Discharge per sq. mi	Drainage Area (sq. miles)	Stream Flow (cfs) *
10	1,290	26.5	49	7	341
50	1,860	26.5	70	7	491
100	2,120	26.5	80	7	560

United States Department of Agriculture
NRCS Natural Resources Conservation Service

New Hampshi

New Hampshire County Rainfall Frequency Data

County or Area Rainfall Amounts in Inches by Frequency

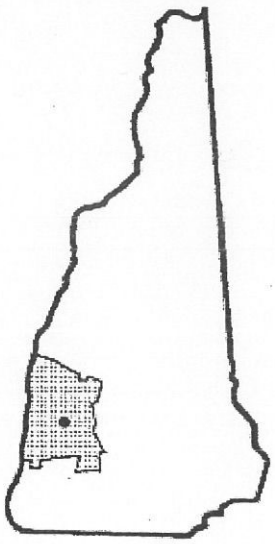
County or Area	1 Year Inches	2 Years Inches	5 Years Inches	10 Years Inches	25 Years Inches	50 Years Inches	100 Years Inches
Belknap	2.4	2.8	3.7	4.1	5.0	5.5	6.1
Carroll - South	2.5	2.9	3.8	4.3	5.2	5.5	6.2
Carroll - North	3.0	3.3	4.3	5.0	5.7	6.2	6.6
Cheshire	2.4	2.8	3.7	4.2	5.0	5.6	6.3
Coos - South	3.0	3.5	4.1	4.8	5.6	6.2	6.8
Coos - North	2.4	3.0	3.5	4.2	4.9	5.3	6.1
Grafton	2.4	2.7	3.6	4.2	4.9	5.2	5.9
Hillsborough	2.5	2.9	3.8	4.3	5.1	5.7	6.3
Merrimack	2.4	2.8	3.7	4.2	5.0	5.6	6.2
Rockingham	2.5	3.0	3.8	4.3	5.2	5.7	6.4
Strafford	2.5	3.0	3.8	4.3	5.1	5.6	6.3
Sullivan	2.3	2.7	3.6	4.1	4.8	5.3	6.0

FLOOD INSURANCE STUDY



TOWN OF NEWPORT, NEW HAMPSHIRE

SULLIVAN COUNTY



APRIL 17, 1985

Federal Emergency Management Agency

COMMUNITY NUMBER - 330161

In the updated study, discharge-frequency relationships for the Sugar River were obtained from a hydrologic model of the Sugar River Basin using the HEC-1 Flood Hydrograph Package (Reference 4). This model did not include the area draining toward Lake Sunapee. It was determined that, with the high storage capacity of the lake, this area will not have a significant effect on the flooding downstream of the lake. To account for the lake dam outflows, 100 cubic feet per second (cfs) were added to HEC-1 discharges. This value was obtained from an integration of the curve of the average lake dam outflows for the past 20 years.

The discharges for the North Branch Sugar River and the South Branch Sugar River were determined using regional analyses of USGS gages in New Hampshire (Reference 5).

A summary of drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
SUGAR RIVER					
Downstream of confluence of North Branch Sugar River	204.1[1]	7,252	10,417	13,028	18,200
At Belknap Avenue	121.7[1]	4,054	5,414	6,793	9,700
At State Route 10	76.0[1]	1,720	2,387	3,053	4,600
NORTH BRANCH SUGAR RIVER					
At Old Cornish Turnpike	80.8	2,070	2,980	3,410	4,390
SOUTH BRANCH SUGAR RIVER					
At Elm Street	45.7	1,810	2,610	2,980	3,840
At Coon Brook Road	26.5	1,290	1,860	2,120	2,730

[1]Includes area draining toward Lake Sunapee

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

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Scale:36
Page 1 of 2
http://man1.msc.fema.gov/idms/IntraView.cgi?DOT=0&O_V=0&O_X=1&O_Y=1&O_Z=0&O_784=0&O_1010=0&O_

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Sugar River (continued)								
AT	56,893[1]	85	798	3.8	846.9	846.9	847.2	0.3
AU	56,957[1]	59	639	4.8	847.4	847.4	847.7	0.3
AV	57,352[1]	111	415	7.4	847.8	847.8	848.1	0.3
AW	58,057[1]	212	957	3.2	851.8	851.8	852.6	0.8
North Branch Sugar River								
A	122[2]	80	304	11.2	773.3	765.8[3]	765.8	0.0
B	190[2]	80	646	5.3	773.3	768.0[3]	768.0	0.0
C	4,080[2]	135	759	4.5	773.3	772.5[3]	772.7	0.2
D	8,662[2]	130	989	3.4	776.1	776.1	777.1	1.0
E	9,552[2]	37	428	8.0	776.8	776.8	777.6	0.8
F	9,604[2]	56	631	5.4	777.4	777.4	778.1	0.7
G	10,134[2]	75	779	4.4	777.9	777.9	778.6	0.7
South Branch Sugar River								
A	242[2]	84	403	7.4	788.3	783.7[3]	784.0	0.3
B	309[2]	60	374	8.0	788.3	784.5[3]	784.5	0.0
C	5,754[2]	228	1,213	2.5	794.9	794.9	795.8	0.9
D	11,682[2]	138	449	6.6	803.1	803.1	803.4	0.3
E	11,751[2]	150	650	4.6	803.5	803.5	804.0	0.5

[1]Feet above corporate limits
[2]Feet above confluence with Sugar River
[3]Elevation computed without consideration of backwater from Sugar River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF NEWPORT, NH
(SULLIVAN CO.)

FLOODWAY DATA

SUGAR RIVER-NORTH BRANCH SUGAR RIVER-
SOUTH BRANCH SUGAR RIVER

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Info
Scale: 36 %
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1:1 Zoom In
MAX Zoom Out

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
South Branch Sugar River (continued)								
F	12,351	75	339	8.8	805.1	805.1	805.2	0.1
G	13,351	85	396	7.5	810.8	810.8	811.0	0.2
H	14,351	126	584	4.6	819.7	819.7	819.8	0.1
I	15,086	36	209	12.8	851.0	851.0	851.4	0.4
J	18,474	40	340	7.9	877.0	877.0	877.8	0.8
K	19,174	48	275	9.7	880.2	880.2	881.0	0.8
L	20,819	67	308	8.7	893.9	893.9	894.6	0.7
M	23,831	49	313	6.8	913.0	913.0	913.3	0.3
N	27,561	45	240	8.8	920.6	920.6	921.5	0.9
O	27,626	60	273	7.8	922.0	922.0	922.0	0.0
P	29,311	56	452	4.7	928.6	928.6	929.5	0.9

[1]Feet above confluence with Sugar River

FEDERAL EMERGENCY MANAGEMENT AGENCY

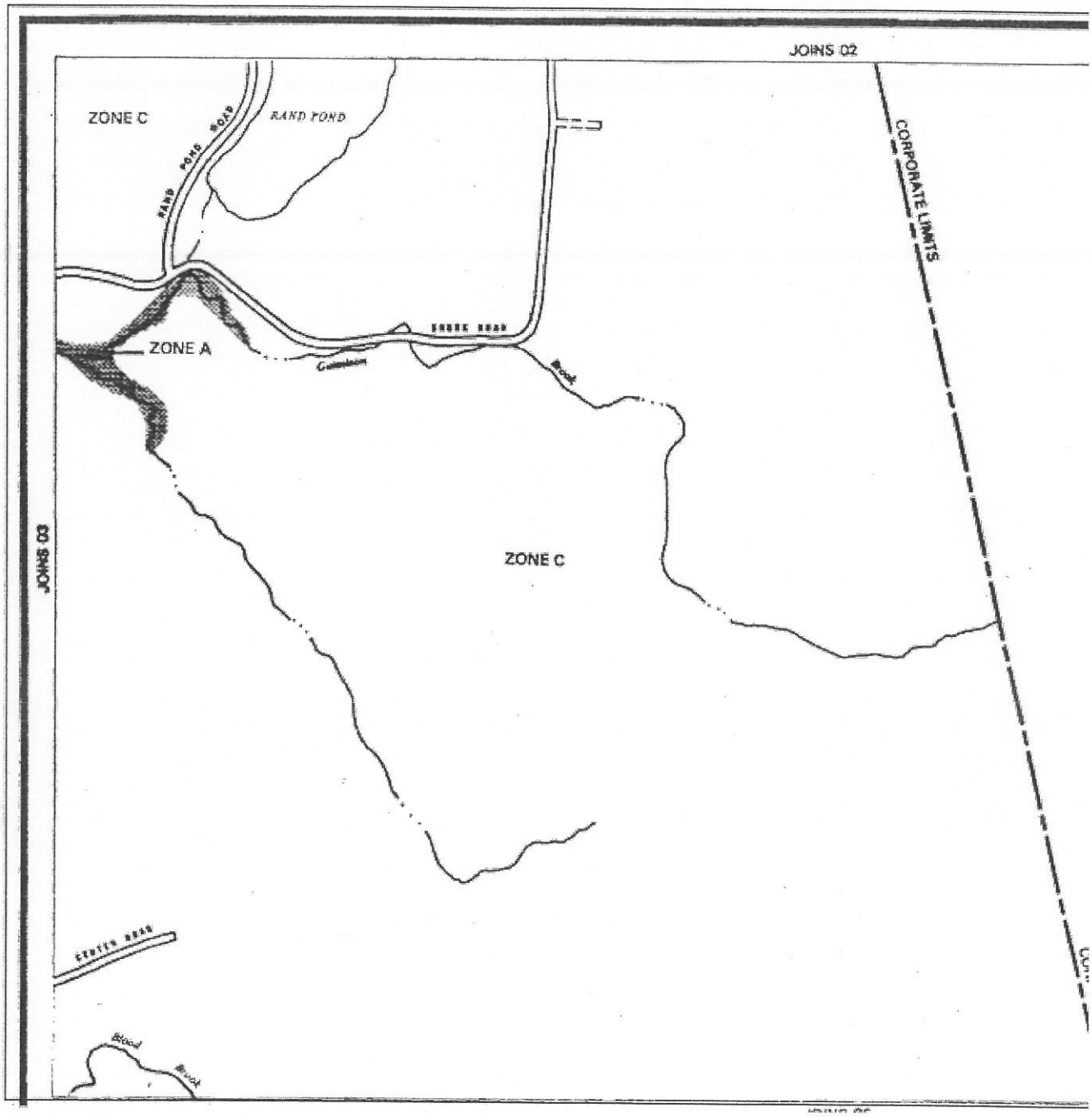
TOWN OF NEWPORT, NH

(SULLIVAN CO.)

FLOODWAY DATA

SOUTH BRANCH SUGAR RIVER

TABLE 2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ZONE C
RAND POND
RAND POND ROAD
CORPORATE LIMITS
ZONE A
ZONE C
JOHNS 03
Blood Brook

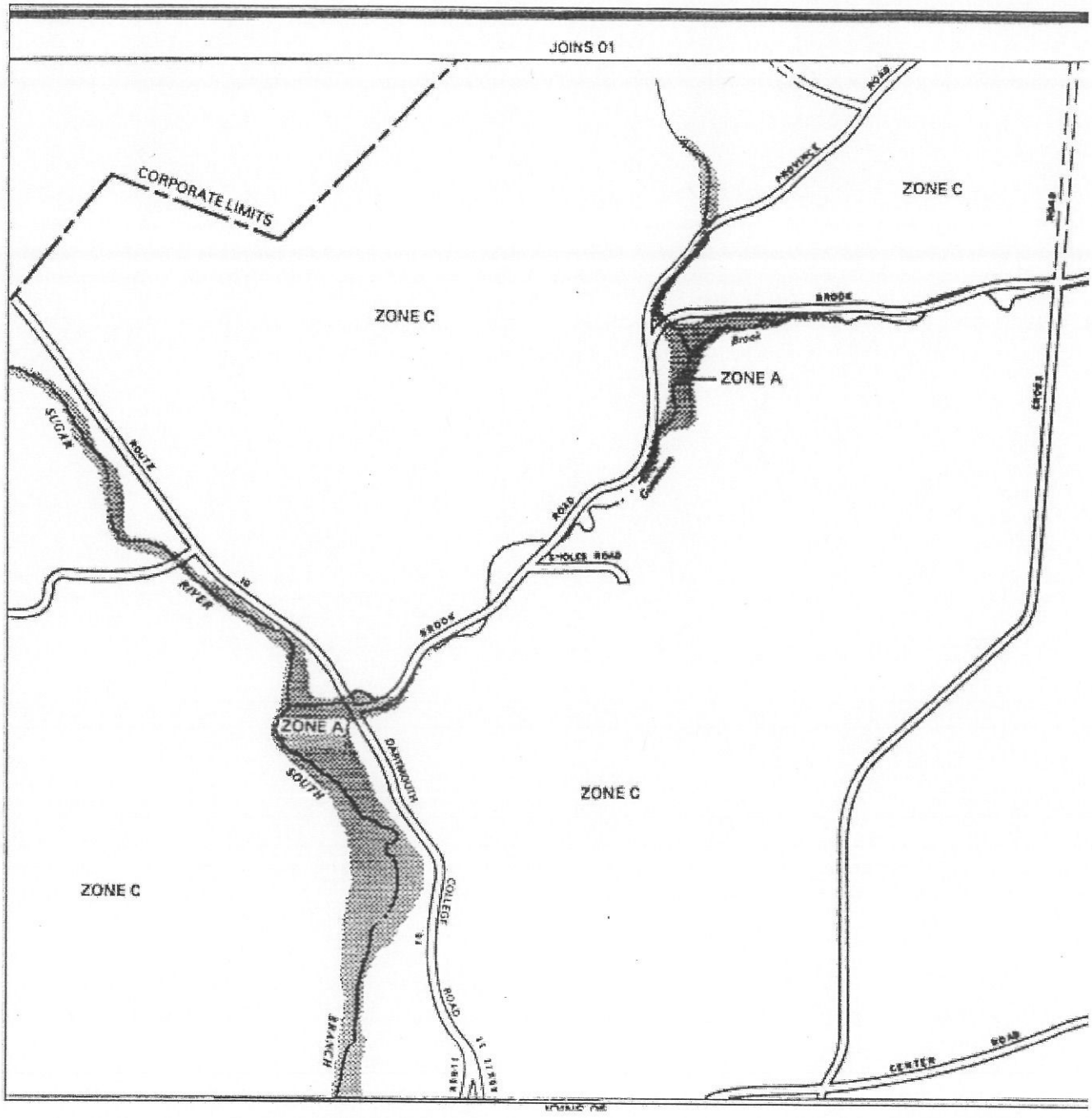
JOINS 01
CORPORATE LIMITS
ZONE C
ZONE C
ZONE A
ZONE A
ZONE C
ZONE C
PROVINCE
ROAD
BROOK
Brook
SUGAR
ROUTE
RIVER
10
ROAD
SHOLES ROAD
BROOK
SOUTH
DARTMOUTH
COLLEGE
ROAD
BRANCH
CENTER
ROAD
CROSS
ROAD

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Erosion factors		Organic matter
							K	T	
	In	Pct	G/cm³	In/hr	In/in	pH			Pct
MaB, MaC, MaD-----	0-8	3-10	1.00-1.30	0.6-2.0	0.10-0.23	3.6-6.0	0.24	3	2-8
Marlow	8-24	3-10	1.30-1.60	0.6-2.0	0.06-0.20	3.6-6.0	0.32		
	24-60	3-10	1.60-2.05	0.06-0.6	0.05-0.12	3.6-6.0	0.20		
MbB, MbC, MbD, MbE-----	0-4	3-10	1.00-1.30	0.6-2.0	0.10-0.23	3.6-6.0	0.20	3	---
Marlow	4-24	3-10	1.30-1.60	0.6-2.0	0.06-0.20	3.6-6.0	0.32		
	24-60	3-10	1.60-2.05	0.06-0.6	0.05-0.12	3.6-6.0	0.20		
McB, McC, McD-----	0-8	1-8	0.80-1.20	0.6-2.0	0.15-0.21	3.6-6.0	0.28	3	3-8
Monadnock	8-36	1-8	0.80-1.30	0.6-2.0	0.09-0.17	3.6-6.0	0.28		
	36-60	1-5	1.30-1.60	2.0-6.0	0.04-0.08	3.6-6.0	0.17		
MfB, MfC, MfD-----	0-2	1-8	0.80-1.20	0.6-2.0	0.14-0.20	3.6-6.0	0.24	3	---
Monadnock	2-36	1-8	0.80-1.30	0.6-2.0	0.09-0.17	3.6-6.0	0.28		
	36-60	1-5	1.30-1.60	2.0-6.0	0.04-0.08	3.6-6.0	0.17		
MrC*, MrD*, MrE*:									
Monadnock-------	0-2	1-8	0.80-1.20	0.6-2.0	0.10-0.18	3.6-6.0	0.24	3	---
	2-36	1-8	0.80-1.30	0.6-2.0	0.09-0.17	3.6-6.0	0.28		
	36-60	1-5	1.30-1.60	2.0-6.0	0.04-0.08	3.6-6.0	0.17		
Hermon----------	0-3	2-6	0.95-1.20	6.0-20	0.07-0.20	3.6-5.5	0.10	3	---
	3-17	2-7	1.00-1.30	6.0-20	0.05-0.17	3.6-6.0	0.10		
	17-60	1-4	1.50-1.70	6.0-20	0.03-0.10	5.1-6.0	0.10		
MuD*:									
Monadnock-------	0-2	1-8	0.80-1.20	0.6-2.0	0.14-0.20	3.6-6.0	0.20	3	---
	2-36	1-8	0.80-1.30	0.6-2.0	0.09-0.17	3.6-6.0	0.28		
	36-60	1-5	1.30-1.60	2.0-6.0	0.04-0.08	3.6-6.0	0.17		
Hermon----------	0-3	2-6	0.95-1.20	6.0-20	0.07-0.20	3.6-5.5	0.10	3	---
	3-17	2-7	1.00-1.30	6.0-20	0.05-0.17	3.6-6.0	0.10		
	17-60	1-4	1.50-1.70	6.0-20	0.03-0.10	5.1-6.0	0.10		
MvB*, MvC*, MvD*:									
Monadnock-------	0-2	1-8	0.80-1.20	0.6-2.0	0.14-0.20	3.6-6.0	0.24	3	---
	2-36	1-8	0.80-1.30	0.6-2.0	0.09-0.17	3.6-6.0	0.28		
	36-60	1-5	1.30-1.60	2.0-6.0	0.04-0.08	3.6-6.0	0.17		
Lyman-----------	0-2	2-10	0.75-1.20	2.0-6.0	0.13-0.24	3.6-6.0	0.20	2	---
	2-15	2-10	0.90-1.40	2.0-6.0	0.08-0.28	3.6-6.0	0.32		
	15	---	---	---	---	---	---		
MwB*, MwC*, MwD*:									
Monadnock-------	0-2	1-8	0.80-1.20	0.6-2.0	0.14-0.20	3.6-6.0	0.24	3	---
	2-36	1-8	0.80-1.30	0.6-2.0	0.09-0.17	3.6-6.0	0.28		
	36-60	1-5	1.30-1.60	2.0-6.0	0.04-0.08	3.6-6.0	0.17		
Lyman-----------	0-2	2-10	0.75-1.20	2.0-6.0	0.13-0.24	3.6-6.0	0.20	2	---
	2-15	2-10	0.90-1.40	2.0-6.0	0.08-0.28	3.6-6.0	0.32		
	15	---	---	---	---	---	---		
Rock outcrop.									
Na----------	0-7	1-5	1.20-1.50	2.0-6.0	0.05-0.09	3.6-5.5	0.17	5	3-7
Naumburg	7-33	1-5	1.20-1.50	6.0-20	0.06-0.08	3.6-5.5	0.17		
	33-60	1-5	1.45-1.65	6.0-20	0.04-0.06	4.5-6.5	0.17		
NnA----------	0-9	3-7	1.00-1.25	2.0-6.0	0.13-0.25	4.5-6.0	0.28	3	2-8
Ninigret	9-26	3-7	1.35-1.60	2.0-6.0	0.06-0.18	4.5-6.0	0.32		
	26-60	0-2	1.45-1.70	6.0-20	0.01-0.13	4.5-6.0	0.10		
Of----------	0-10	1-9	1.15-1.40	2.0-6.0	0.12-0.26	4.5-6.5	0.24	5	3-7
Ondawa	10-36	1-9	1.15-1.45	2.0-6.0	0.12-0.22	4.5-6.5	0.37		
	36-60	0-3	1.30-1.50	2.0-20	0.04-0.13	4.5-6.5	0.20		

See footnote at end of table.

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Place Name: Goshen (Town of)

NBI Structure Number: **009800850011700**
Longitude: **-72° 08' 51"**, Latitude: **43° 18' 5"**

Show me a Map on the U.S. Census Service Tiger Map Server

Facility Carried: **BROOK ROAD**
Feature Intersected: **GUNNISON BROOK**
Location: **.05 MI NE OF JCT NH 10**

Year Built: **1940**, Reconstructed: **1998**

Owned and maintained by: **State Highway Agency**

Functional Classification: **Rural Minor Collector**
Service On Bridge: **Highway**
Service Under Bridge: **Waterway**
Lanes On Structure: **2**

Structure Length: **8.9 m**
Bridge Roadway Width: **8.9 m**
Operating Rating: **56. Metric Tons**
Number of Spans in Main Unit: **1 Span**
Material Design: **Concrete**
Design Construction: **Slab**

Deck Condition: **Good Condition**
Superstructure Condition: **Good Condition**
Substructure Condition: **Good Condition**
Scour: **Foundations determined to be stable for assessed scour conditions**

Bridge Railing: **Meets currently acceptable standards.**
Inspection Date: **May, 2000**

Structural Evaluation: **Better than present minimum criteria**
Water Adequacy Evaluation: **Superior to present desirable criteria**

Average Daily Traffic: **200**
Year of Average Daily Traffic: **1984**
Sufficiency Rating: **97. %**

Return to National Bridge Inventory Database query form.

Disclaimer Statement - Alexander Svirsky, Massroads.com and Granitehighways.com provide no warranty whatsoever, express or implied, as to the accuracy, reliability or completeness of furnished data.

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Place Name: Goshen (Town of)

NBI Structure Number: **009800870012000**
Longitude: **-72° 08' 39"**, Latitude: **43° 18' 14"**

Show me a Map on the U.S. Census Service Tiger Map Server

Facility Carried: **BROOK ROAD**
Feature Intersected: **GUNNISON BROOK**
Location: **.32 MI NE OF JCT NH 10**

Year Built: **1940**

Owned and maintained by: **State Highway Agency**

Functional Classification: **Rural Minor Collector**
Service On Bridge: **Highway**
Service Under Bridge: **Waterway**
Lanes On Structure: **2**

Structure Length: **9.8 m**
Bridge Roadway Width: **8.6 m**
Operating Rating: **25. Metric Tons**
Number of Spans in Main Unit: **1 Span**
Material Design: **Steel**
Design Construction: **Stringer/Multi-beam or Girder**

Deck Condition: **Good Condition**
Superstructure Condition: **Good Condition**
Substructure Condition: **Good Condition**
Scour: **Foundations determined to be stable for assessed scour conditions**
Bridge Railing: **Does not meet currently acceptable standards.**
Inspection Date: **May, 2000**

Structural Evaluation: **Somewhat better than minimum adequacy to tolerate being left in place as is**
Water Adequacy Evaluation: **Equal to present minimum criteria**

Average Daily Traffic: **200**
Year of Average Daily Traffic: **1984**
Sufficiency Rating: **74. %**

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Place Name: Goshen (Town of)

NBI Structure Number: **009800900012300**
Longitude: **-72° 08' 30"**, Latitude: **43° 18' 20"**

Show me a Map on the U.S. Census Service Tiger Map Server

Facility Carried: **BROOK ROAD**
Feature Intersected: **GUNNISON BROOK**
Location: **.47 MI N E OF JCT NH 10**

Year Built: **1945**

Owned and maintained by: **State Highway Agency**

Functional Classification: **Rural Minor Collector**
Service On Bridge: **Highway**
Service Under Bridge: **Waterway**
Lanes On Structure: **2**

Structure Length: **7 m**
Bridge Roadway Width: **8 m**
Operating Rating: **48. Metric Tons**
Number of Spans in Main Unit: **1 Span**
Material Design: **Concrete**
Design Construction: **Slab**

Deck Condition: **Good Condition**
Superstructure Condition: **Good Condition**
Substructure Condition: **Good Condition**
Scour: **Foundations determined to be stable for assessed scour conditions**

Bridge Railing: **Meets currently acceptable standards.**
Inspection Date: **May, 2000**

Structural Evaluation: **Better than present minimum criteria**
Water Adequacy Evaluation: **Equal to present desirable criteria**

Average Daily Traffic: **200**
Year of Average Daily Traffic: **1984**
Sufficiency Rating: **95. %**

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NORTH EAST NEW RAIL BRIDGE DATABASE PHOTO SEARCH LINKS ABOUT CONTACT

Bridge Photos and Road Photos and Train Pictures For Sale Online

Place Name: Goshen (Town of)

NBI Structure Number: **009801050012900**
Longitude: **-72° 07' 32"**, Latitude: **43° 18' 45"**

Show me a Map on the U.S. Census Service Tiger Map Server

Facility Carried: **CROSS ROAD**
Feature Intersected: **GUNNISON BROOK**
Location: **TOWN RD**

Year Built: **1940**

Owned and maintained by: **City or Municipal Highway Agency**

Functional Classification: **Rural Local**
Service On Bridge: **Highway**
Service Under Bridge: **Waterway**
Lanes On Structure: **2**

Structure Length: **4.3 m**
Operating Rating: **9.1 Metric Tons**
Number of Spans in Main Unit: **2 Spans**
Material Design: **Aluminum, Wrought Iron or Cast Iron**
Design Construction: **Culvert (includes frame culverts)**

Scour: **Foundations determined to be stable for assessed scour conditions**
Bridge Railing: **Does not meet currently acceptable standards.**
Inspection Date: **November, 2000**

Structural Evaluation: **Basically intolerable requiring high priority of corrrective action**

Water Adequacy Evaluation: **Equal to present minimum criteria**

Average Daily Traffic: **110**
Year of Average Daily Traffic: **1987**
Sufficiency Rating: **40. %**

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Bridge Photos and Road Photos and Train Pictures For Sale Online

Place Name: Goshen (Town of)

NBI Structure Number: **009800810011700**
Longitude: **-72° 08' 55"**, Latitude: **43° 18' 5"**

Show me a Map on the U.S. Census Service Tiger Map Server



Facility Carried: **NH 10**
Feature Intersected: **GUNNISON BROOK**
Location: **1.78 MI N LEMPSTER TL**

Year Built: **1975**

Owned and maintained by: **State Highway Agency**

Functional Classification: **Rural Major Collector**
Service On Bridge: **Highway-pedestrian**
Service Under Bridge: **Waterway**
Lanes On Structure: **2**

Structure Length: **7.6 m**
Bridge Roadway Width: **9.8 m**
Operating Rating: **61. Metric Tons**
Number of Spans in Main Unit: **1 Span**
Material Design: **Concrete**
Design Construction: **Frame (except frame culverts)**

Deck Condition: **Good Condition**
Superstructure Condition: **Good Condition**
Substructure Condition: **Good Condition**
Scour: **Foundations determined to be stable for assessed scour conditions**

Bridge Railing: **Does not meet currently acceptable standards.**
Inspection Date: **July, 1999**

Structural Evaluation: **Better than present minimum criteria**
Water Adequacy Evaluation: **Superior to present desirable criteria**

Average Daily Traffic: **2600**
Year of Average Daily Traffic: **1993**
Sufficiency Rating: **91. %**

Return to National Bridge Inventory Database query form.

Disclaimer Statement - Alexander Svirsky, Massroads.com and Granitehighways.com provide no warranty whatsoever, express or implied, as to the accuracy, reliability or completeness of furnished data.

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USGS

Water Resources

Data Category: Site Information | Geographic Area: New Hampshire | go

A scheduled power outage will affect access to **NWISWeb historical data**, updates for WaterWatch maps, and ftp services for water.usgs.gov. The outage could begin as early as Friday, May 21, 2004 at 10:30 pm EDT, and may continue as late as Monday May 24, 2004, 12:00 pm EDT. We are sorry for any inconvenience this may cause.

The following NWISWeb services will be affected:

- Discrete data **will not** be available during this time period (Water Quality Information, Ground-water levels, peaks, historical streamflow)
- Daily Streamflow Conditions maps **will not** be up-to-date.
- However, Real-time data **will** be available at http://waterdata.usgs.gov/nwis

Site Map for New Hampshire

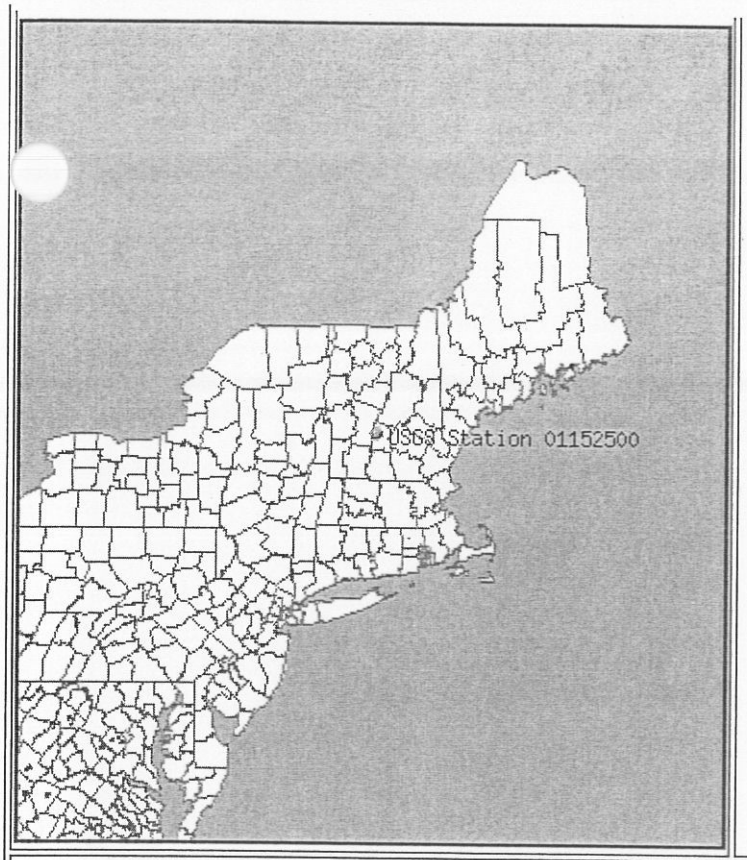
View real-time groundwater levels in Warner, NH. here

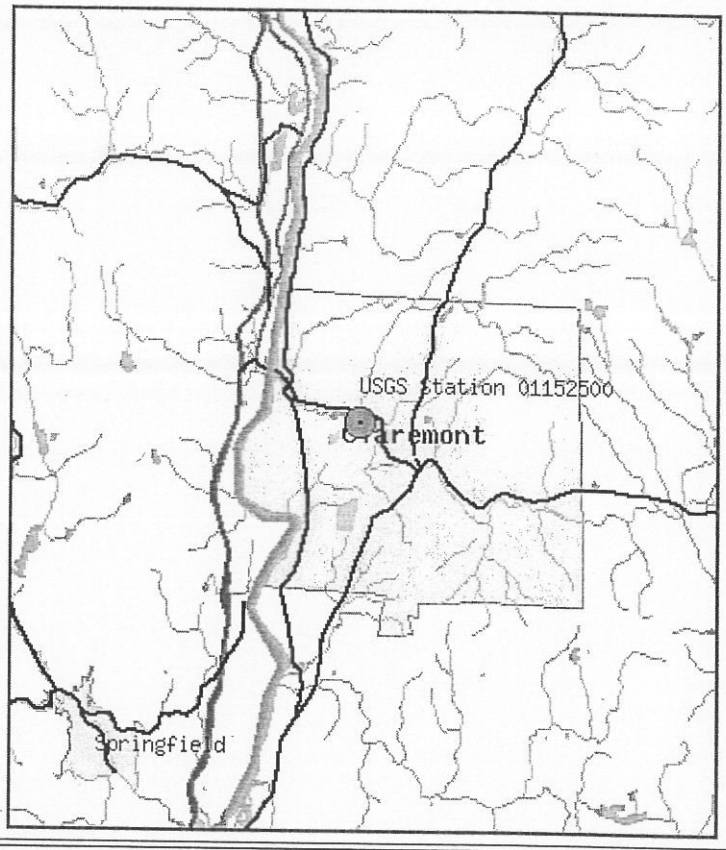
USGS 01152500 SUGAR RIVER AT WEST CLAREMONT, NH

Available data for this site: Station site map | GO

Sullivan County, New Hampshire
Hydrologic Unit Code 01080104
Latitude 43°23'15", Longitude 72°21'45" NAD27
Drainage area 269.00 square miles
Gage datum 358.78 feet above sea level NGVD29

Location of the site in New Hampshire.	Site map.





ZOOM IN 2X, 4X, 6X, 8X, or ZOOM OUT 2X, 4X. 6X. 8X.

Maps are generated by US Census Bureau TIGER Mapping Service.

Questions about data gs-w-nh_NWISWeb_Data_Inquiries@usgs.gov
Feedback on this website gs-w-nh_NWISWeb_Maintainer@usgs.gov

Top
Explanation of terms

NWIS Site Inventory for New Hampshire: Site Map
http://waterdata.usgs.gov/nh/nwis/nwismap?

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TRAFFIC IMPACT AND SITE ACCESS STUDY

MOUNT SUNAPEE WEST BOWL EXPANSION

Newbury, New Hampshire
Goshen, New Hampshire
Sunapee, New Hampshire

June 2004

Prepared for
Mount Sunapee Resort

Stephen G. Pernaw
& Company

Stephen G. Pernaw & Company

47 Hall Street, Suite 3 • Concord, NH 03301
tel: (603) 228-5750 • fax: (603) 228-5886 • sgp@lr.net

Transportation: Engineering • Planning • Design

TRAFFIC IMPACT AND SITE ACCESS STUDY
MOUNT SUNAPEE - WEST BOWL EXPANSION
NEWBURY, GOSHEN and SUNAPEE, NEW HAMPSHIRE
JUNE 3, 2004

I. INTRODUCTION

The Mount Sunapee Resort is located on NH Route 103 (NH103) at the Mount Sunapee Traffic Circle in Newbury, New Hampshire. Access to the mountain is provided via one access road that extends in a southerly direction from the traffic circle. The existing ski facility has a comfortable carrying capacity (CCC) of approximately 5,220 skiers per day. Several previously planned on-mountain improvements and enhancements will bring the CCC up to approximately 5,650 skiers per day soon. Recognizing that existing skier demand exceeds the skier capacity on certain peak days, and that skier demand will increase in the years to come, the West Bowl Expansion project is intended to better serve the public by increasing the CCC by approximately 1,200 skiers per day, bringing the total to 6,850 skiers per day.

II. PROPOSED DEVELOPMENT

The West Bowl Expansion project involves a new ski lift and additional skiing terrain on the west side of the mountain. The expansion project includes the construction of 175 to 250 condominium units that will be located on private property that abuts the state lands. The condominium units will be comprised of hotel style units, two-story attached townhouses, and single-family detached dwellings, and many will be offered for sale on a "quarter share" basis.

Access to the West Bowl base lodge parking area, and the recreational homes is proposed via a new driveway on Brook Road in Goshen, New Hampshire. The proposed intersection is located approximately 2.1 miles south of the NH103/Brook Road intersection (in Sunapee, New Hampshire), and approximately 3.25 miles north of the NH10/Brook Road intersection (in Goshen, New Hampshire), and will intersect the east side of the roadway. The location of the subject site with respect to the area roadway network is shown on Figure 1.

In addition to traffic increases from local skiers, non-local day skiers, overnighters, and new residences, the expansion project will also result in approximately 108 additional employees on a typical weekend day. These additional employees will be affiliated with the skiing and the mountain, and others will be involved with the condominium/housing function. To put these statistics into perspective, Mount Sunapee reports that they currently utilize approximately 435-450 employees on a typical winter weekend.

Preliminary timetables indicate that project implementation would involve several years, and it is assumed for the purposes of this report that completion could occur by 2010. Accordingly, the traffic projections and analyses contained herein utilize 2010 as the base year, and 2020 as the ten-year planning horizon.



= AUTOMATIC TRAFFIC RECORDER LOCATION

= INTERSECTION TURNING MOVEMENT COUNT LOCATION

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Figure 1

Site Location

Traffic Impact and Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

III. ACCESSIBILITY

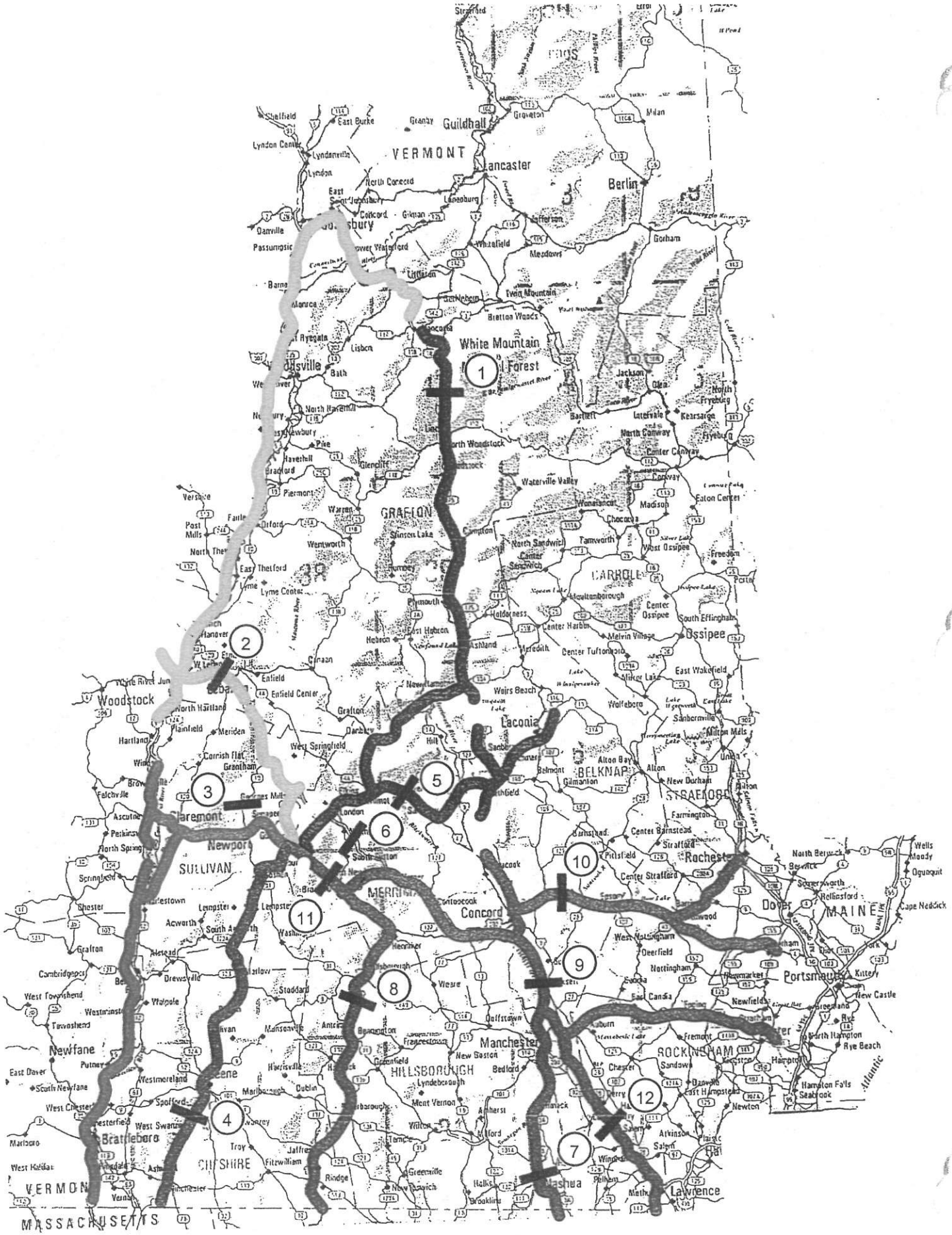
A. STATEWIDE – Mount Sunapee on NH103 is easily reached from Interstate Route 89 (I-89) via Exit 9 (and NH103) for northbound vehicles from Concord, Manchester, Nashua, and eastern Massachusetts, and via Exit 12-A (and NH11 to NH103-B) for southbound vehicles. From I-91 in central Vermont, most skiers take Exit 8 and travel east on NH103 through Claremont and Newport to reach the ski area. New Hampshire Routes 103-A and 103-B provide access between NH103 and I-89. Skiers from the southwest portion of the state utilize NH Route 10 (NH10) and Brook Road to reach NH103 and the traffic circle.

With the new point of access to the ski area and a new base lodge on Brook Road, those that currently utilize Brook Road to reach the mountain, will no longer need to travel to NH103 and enter the ski area via the traffic circle. Similarly, skiers arriving from points west via NH103 will have a choice between parking at the main mountain (via the traffic circle) or the new lodge (via Brook Road). Providing a secondary means of access to the ski area via the West Bowl area will reduce the number of existing vehicle-trips that utilize the traffic circle.

The diagram and table on Figure 2 show the primary access routes to Mount Sunapee from a statewide perspective and a summary of available traffic count data at several "checkpoints" throughout the State. In all cases, traffic demand on these principal access routes is lower during January and February (winter ski months) than during the peak summer months. With few exceptions, January and February travel is also below "average month" conditions (Annual Average Daily Traffic).

B. REGIONAL - The diagram and tables on Figure 3 show how the primary access routes to Mount Sunapee form four "gateways" that converge at the traffic circle, and several statistics from several nearby New Hampshire Department of Transportation (NHDOT) traffic recorder stations. The closest permanent traffic recorder station to the Mount Sunapee Ski Resort was located on NH103 in Newbury (east of Andrews Brook). This station was not so permanent in that the NHDOT discontinued its use in the spring of 2002. Nevertheless, from several years of historical data it is evident that traffic demand has been steadily increasing over the last decade (annual growth rate = 2.2%), and that the winter month travel is comparable to summer month travel due to the count station's proximity to the ski area.

The daily variations graph confirms that peak travel demand occurs on weekends. The hourly data suggests that on peak weekends, there are two separate and distinct peak hour periods. The morning peak hour period typically occurred from 8:00 to 9:00 AM and strongly reflects the ARRIVAL period for skiers. The afternoon peak hour period occurred from 4:00 to 5:00 PM and corresponds to the peak DEPARTURE period for the ski area. It is important to note that the hourly traffic demand falls off considerably before and after these periods. This means that periods with traffic congestion are of relatively short duration.


VERMONT
Guildhall
Lancaster
Berlin
White Mountain
Forest
GRAFTON
CARROLL
Woodstock
Laconia
BELKNAP
STRAFFORD
Claremont
Newport
SULLIVAN
Concord
Rochester
Dover
MAINE
Portsmouth
Manchester
HILLSBOROUGH
ROCKINGHAM
Nashua
Lawrence
Keene
Brattleboro
CHESHIRE
Newfane
MASSACHUSETTS
1
2
3
4
5
6
7
8
9
10
11
12

1. I-93 Lincoln (North of Exit 33)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	7643	8991	9833
Peak Month	13888	12817	13701
Winter Month	7606	8112	8926

2. I-89 NH - VT State Line

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	39959	34883	32337
Peak Month	44549	39894	36873
Winter Month	36412	30972	27920

3. NH 10 Newport (1 Mi. S. of Croydon T/L)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	4122	3303	2698
Peak Month	4488	3861	3068
Winter Month	3776	2711	2320

4. NH 10 Swanzey (S. of Base Hill Road)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	11592	11009	8688
Peak Month	12425	12160	9647
Winter Month	10512	9464	7214

5. US 4 & NH 11 Andover (West of Junction)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	5423	5734	4688
Peak Month	6121	6346	6177
Winter Month	4831	5439	4179

6. I-89 Sutton - Warner Town Line

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	7643	8991	9833
Peak Month	13888	12817	13701
Winter Month	7606	8112	8926

7. US 3 Nashua (Exit 5 -6 FEETurnpike)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	7643	8991	9833
Peak Month	13888	12817	13701
Winter Month	7606	8112	8926

8. US 202 Antrim (South of Rest Area)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	5285	4660	3870
Peak Month	5851	5323	4656
Winter Month	4760	3828	2960

9. I-93 Hooksett (Toll Booth - Exit 11)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	67927	62273	63593
Peak Month	79705	78073	79668
Winter Month	63006	54593	55391

10. US 4 Chichester (East of Chichester Road)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	18224	16929	14814
Peak Month	21094	21324	18945
Winter Month	16185	13607	11298

11. NH 103 (East of Andrews Brook Bridge)*

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	4357	5187	4787
Peak Month	5328	6971	6377
Winter Month	4338	5514	6081

12. I-93 Windham (Derry Town Line)

	Avg. W'day	Avg. Sat.	Avg. Sun.
AADT	67927	62273	63593
Peak Month	79705	78073	79668
Winter Month	63006	54593	55391

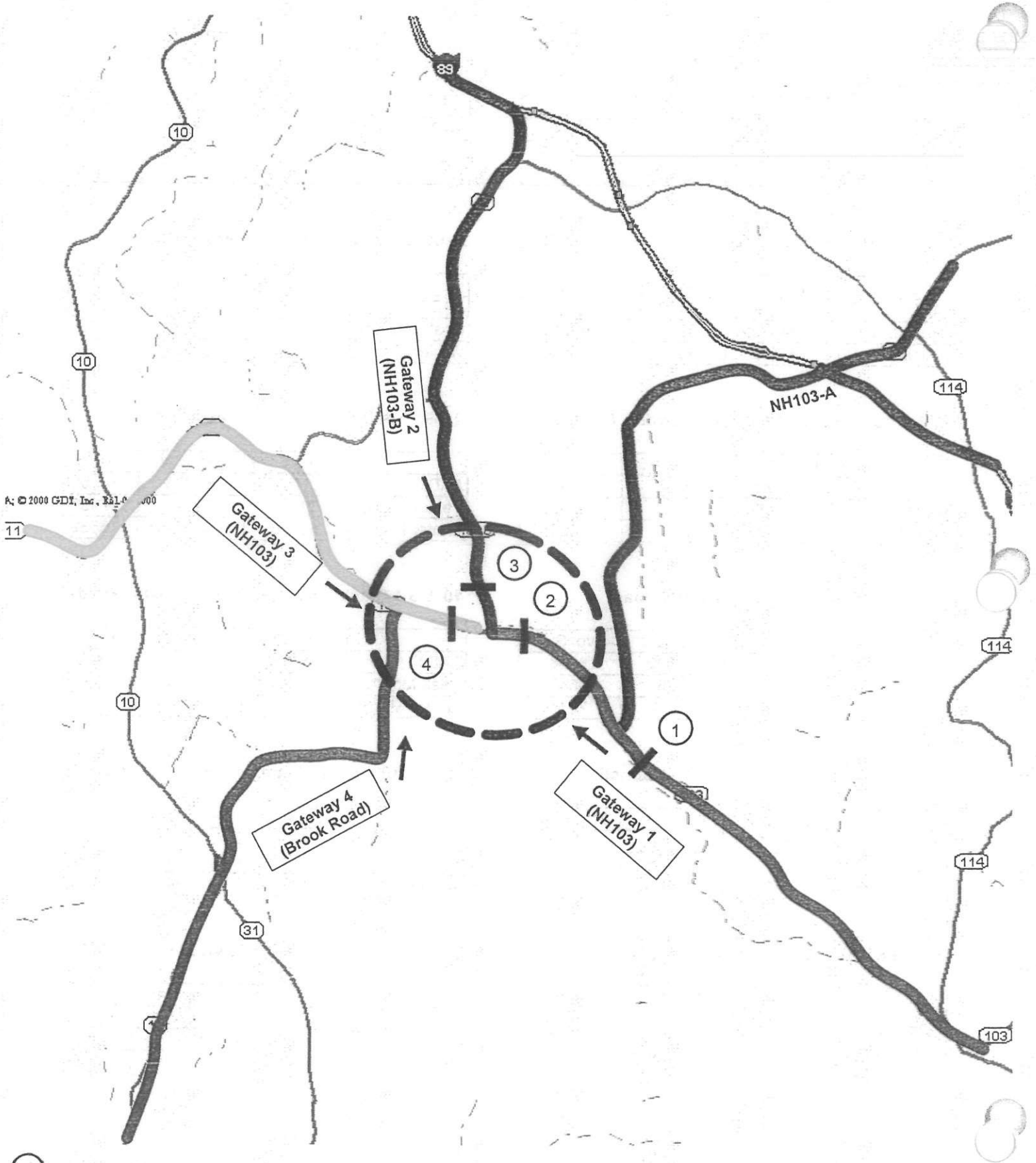
AADT - Annual Average Daily Traffic Volume
Peak Month = July or August
Winter Month = January or February
* 2001 Data (latest available)

01

Figure 2

Statewide Access Routes - 2003 Traffic Volumes

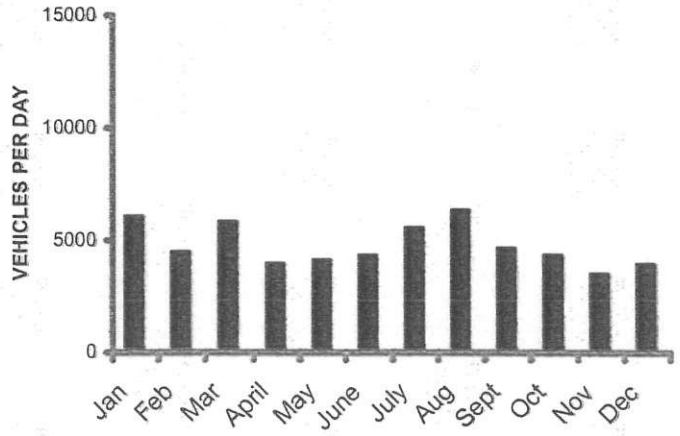
Traffic Impact and Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire


89
10
10
10
11
114
114
114
103
31
NH103-A
Gateway 2
(NH103-B)
Gateway 3
(NH103)
Gateway 4
(Brook Road)
Gateway 1
(NH103)
1
2
3
4
X
Count Location Number

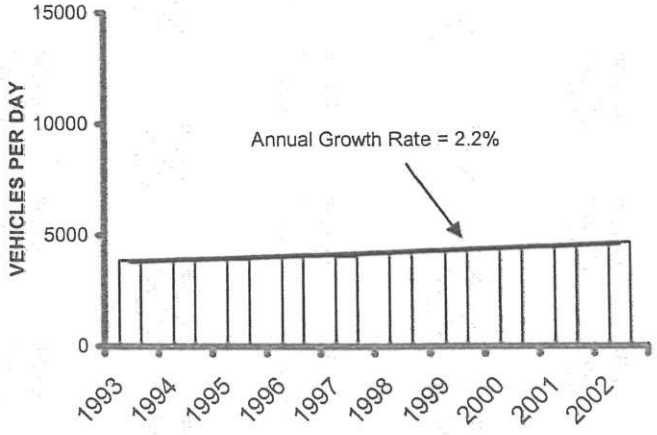
LOCATION 1: NH ROUTE 103 (East of Andrews Brook Bridge)

(NHDOT Permanent Recorder Location - 02321001)

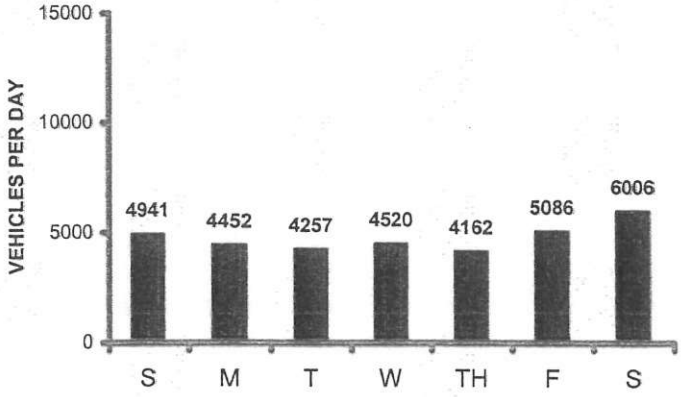
MONTHLY TRAFFIC VARIATIONS
(2001)



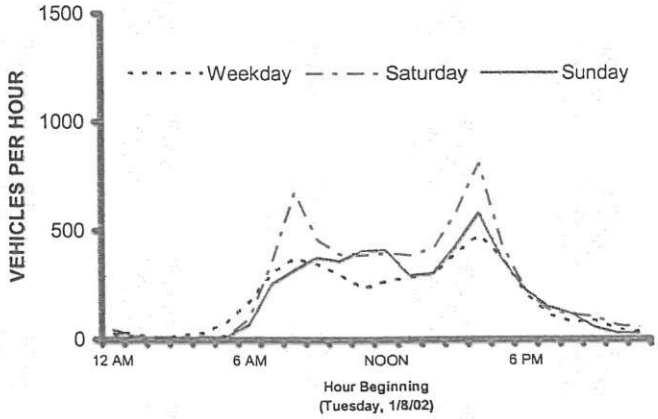
YEARLY TRAFFIC VARIATIONS



AVERAGE DAILY TRAFFIC VARIATIONS
(January, 2002)



HOURLY TRAFFIC VARIATIONS



1) NHDOT Permanent Recorder Station 02321001 was discontinued in Spring of 2002

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Figure 3

Regional Access Routes/Permanent Recorder Station - Temporal Variations

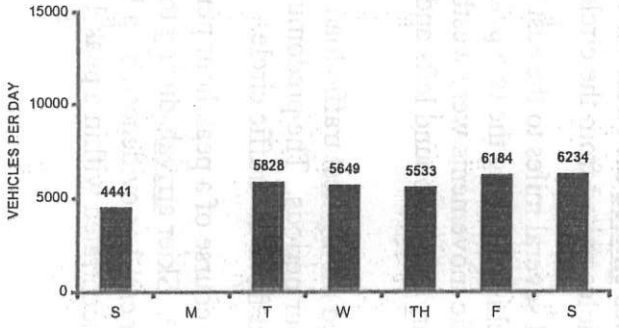
Traffic Impact and Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

The graphs on Figure 4 depict the results from the latest NHDOT traffic recorder counts on the three major legs of the traffic circle. These data are several years old and reflect summer (July and September) traffic demand. Nevertheless, this data illustrates that the peak hour volumes on the two NH103 stations ranged from 500 to 600 vehicles per hour (vph), and the NH103-B station exhibits the lowest volumes, which are on the order of 200 vph.

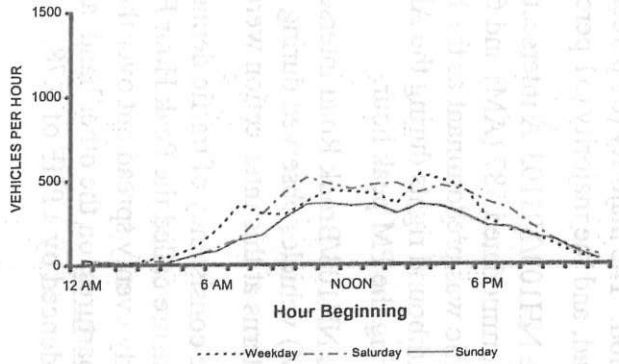
Pernaw & Company

LOCATION 2 - NH 103
(Over Johnson Brook)

DAILY TRAFFIC VARIATIONS
(September 2002)

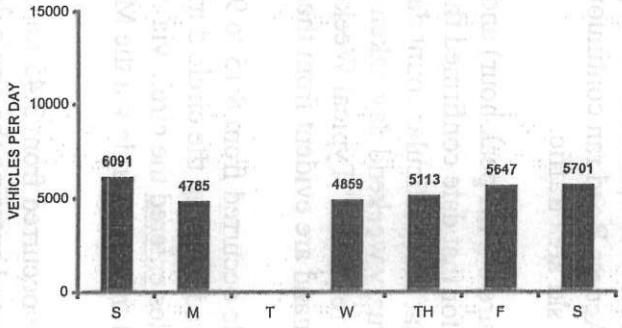


HOURLY TRAFFIC VARIATIONS



LOCATION 3 - NH 103
(Newbury - Sunapee Town Line)

DAILY TRAFFIC VARIATIONS
(July 2001)



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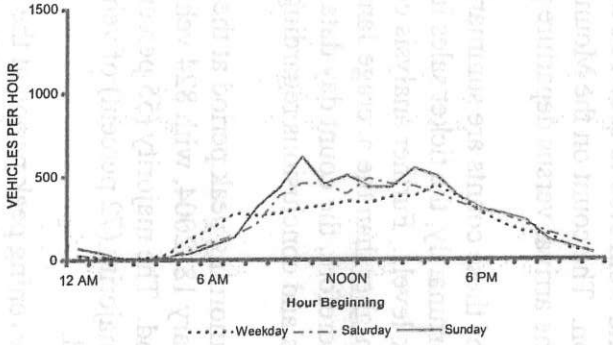
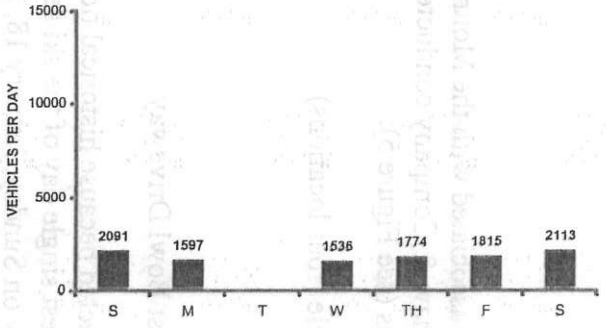
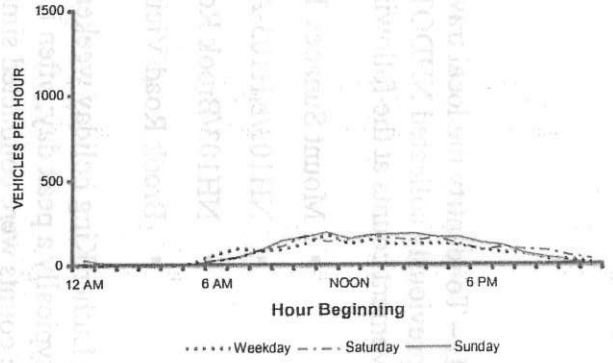


LOCATION 4 - NH 103B
(Newbury - Sunapee Town Line)

DAILY TRAFFIC VARIATIONS
(July 2001)



HOURLY TRAFFIC VARIATIONS



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* Data not available

Figure 4

Short-Term Recorder Stations - Temporal Variations

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

C. LOCAL – To identify the local travel patterns associated with the Mount Sunapee Resort, and update the previously collected NHDOT data, Pernaw & Company conducted detailed intersection turning movement counts at the following locations (see Figure 5):

- Mount Sunapee Traffic Circle (four locations)
- NH103/NH103-A
- NH103/Brook Road
- Brook Road/Vicinity of West Bowl Driveway

The Martin Luther King holiday weekend was selected because historical ticket sales data confirms that this is typically a peak day; often it is the busiest single day of the ski season. Consequently, these traffic counts were conducted simultaneously on Sunday, January 18, 2004, from 8:00 to 11:00 AM and from 3:00 to 5:00 PM in order to observe the peak one-hour period in the morning and afternoon. The count on the Mount Sunapee Access Road ran continuously throughout the day to tabulate the arrival versus departure patterns for ski area traffic.

The results of these counts are summarized on Figure 6 (AM peak hour) and Figure 7 (PM peak hour). Unfortunately, the ticket sales information for that date confirmed that it was well below historic peak levels. Further analysis confirmed that that particular count day was approximately ten percent higher than the average January – February weekend day, taken over the last four ski seasons. Therefore, the count day data reasonably reflects a "Typical Weekend Day" condition. Several facts and conclusions regarding traffic demand are evident from these data:

- The morning peak period at the traffic circle occurred from 8:15 to 9:15 AM on Sunday, January 18, 2004, with 824 vehicles observed entering the circle during that one-hour period. The majority (55 percent) of vehicles entered the circle via NH103 westbound, and the majority (72 percent) of vehicles exited from the circle via the Mount Sunapee Access Road.
- The evening peak period at the traffic circle occurred from 3:45 to 4:45 PM on Sunday, January 18, 2004, with 1,003 vehicles observed entering the circle during that one-hour period. The majority (66 percent) of vehicles entered the circle via Mount Sunapee Access Road, and the majority (51 percent) of vehicles exited from the circle via NH103 eastbound.
- The NH103/NH103-A intersection, located several miles to the east of the traffic circle, accommodated 587 (AM) and 608 (PM) vehicles during the two peak hour periods. Skier traffic was predominant as the heavier traffic movements were westbound through and southbound rights during the AM peak hour, and eastbound lefts and eastbound throughs during the PM peak hour.
- The NH103/Brook Road intersection carried the lightest traffic load with 239 (AM) and 376 (PM) vehicles observed during the peak hour periods. The predominant turning movement patterns at this intersection were also to and from the traffic circle.
- The consistency of traffic demand over the course of a peak hour period is quantified by a measure called the Peak Hour Factor (PHF). Skier arrivals during the AM peak hour were fairly evenly spread out over the one-hour period as evidenced by a PHF of 0.84. Skier departures, on the other hand, are more concentrated within a peak 15-minute interval as evidenced by a PHF of 0.78.

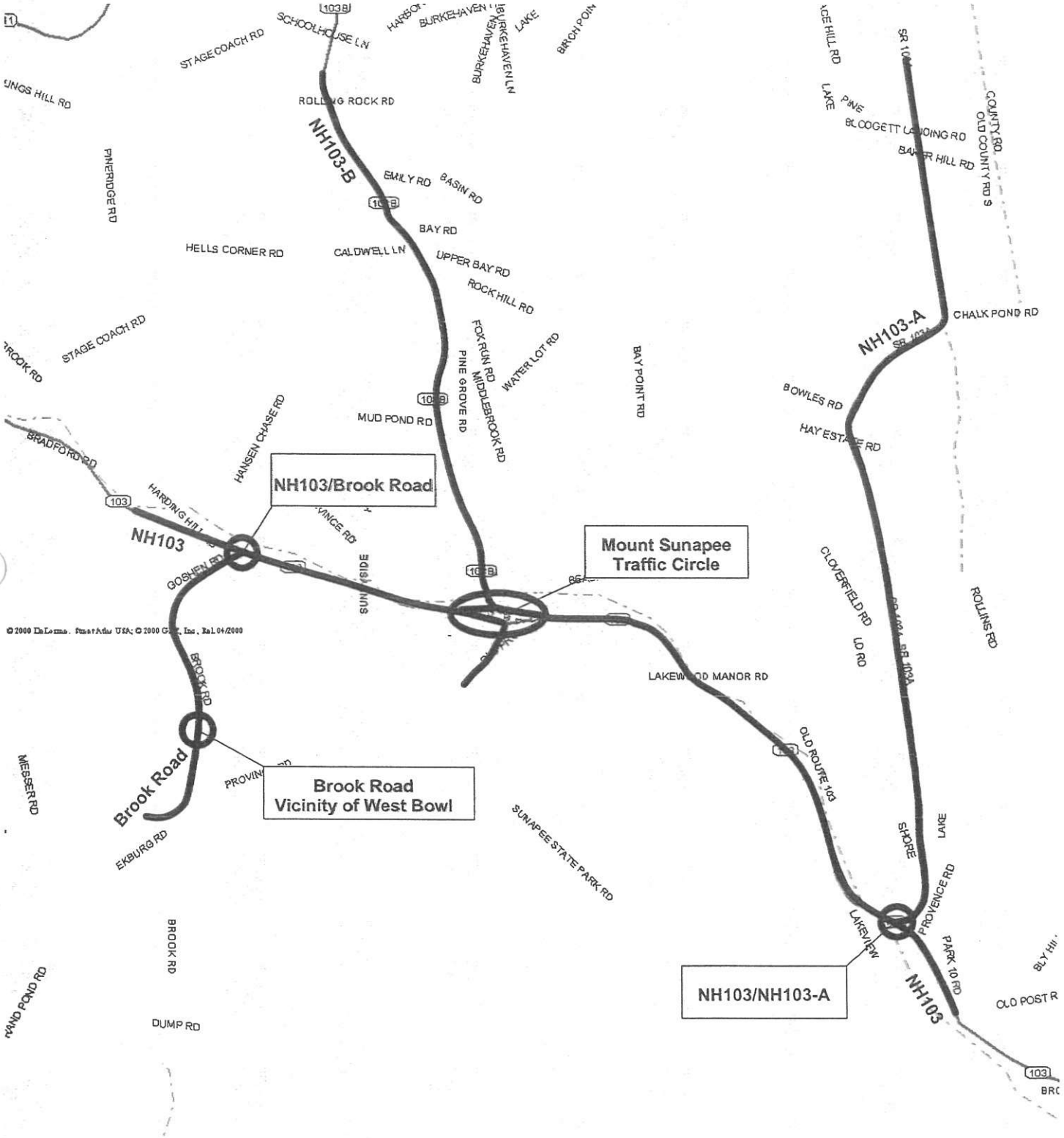

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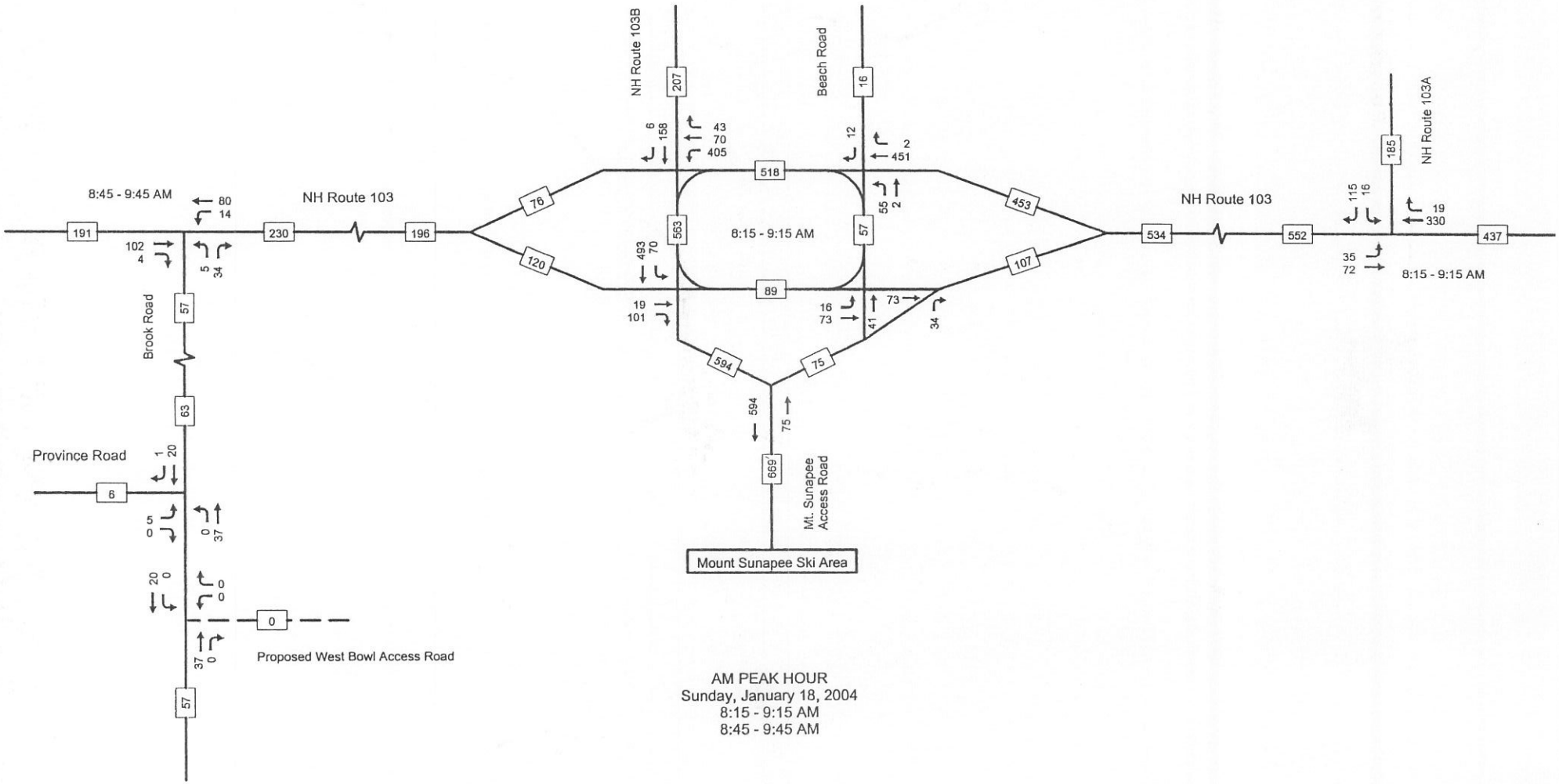
Figure 5

Local Access Routes (with Intersection Turning Movement Count Locations)

Traffic Impact and Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

Pernaw & Company



AM PEAK HOUR
Sunday, January 18, 2004
8:15 - 9:15 AM
8:45 - 9:45 AM

NORTH

78601

ure 6

2004 Existing Traffic Volumes - AM Peak Hour

Traffic Impact & Site Access Study, Proposed S... Expansion, Newbury, New Hampshire

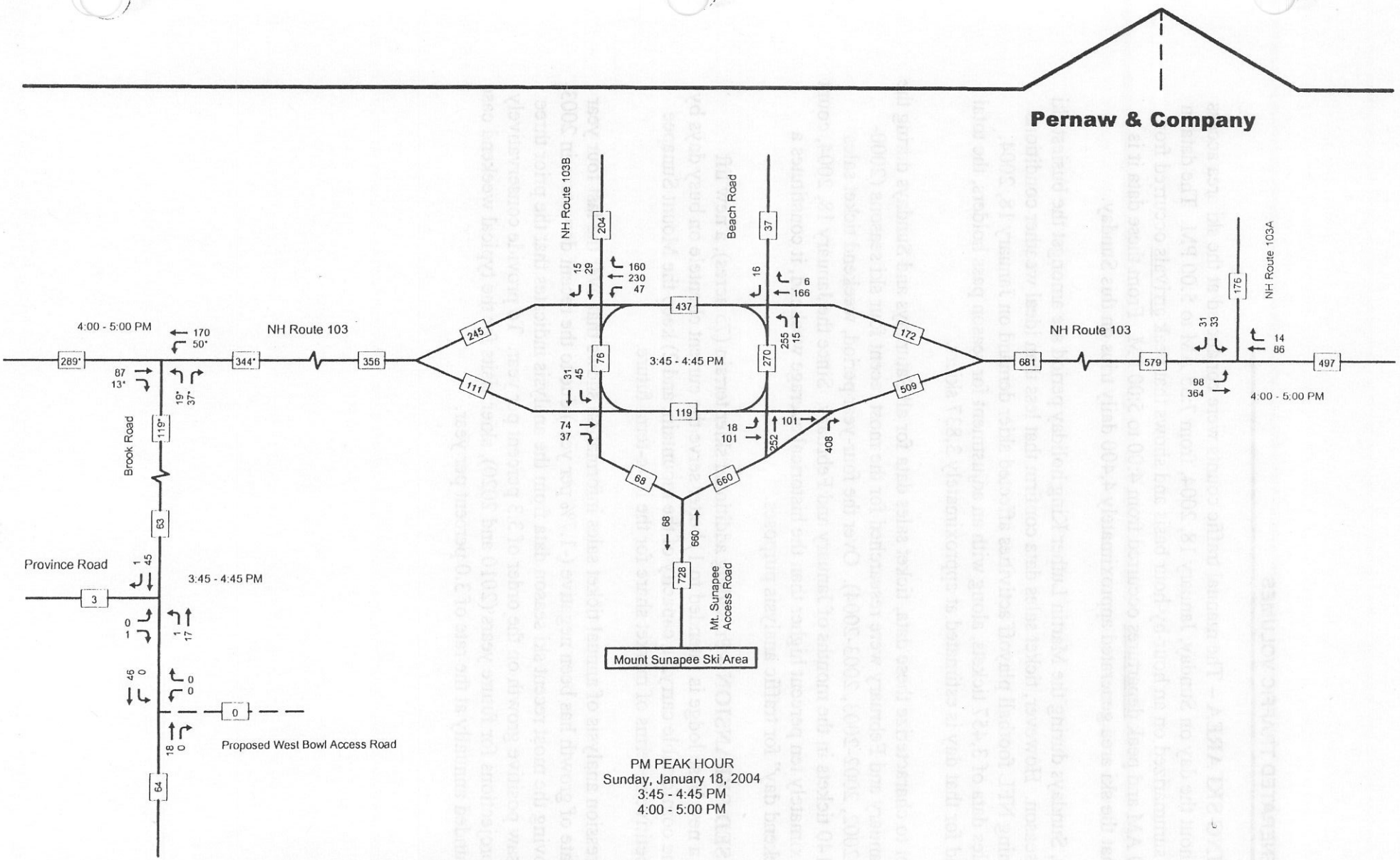


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Figure 7

2004 Existing Traffic Volumes - PM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

IV. SITE GENERATED TRAFFIC VOLUMES

A. EXISTING SKI AREA – The manual traffic counts were conducted at the ski area access road throughout the day on Sunday, January 18, 2004, from 7:35 AM to 5:00 PM. The data in Table 1 are summarized on an hour-by-hour basis and shows that peak arrivals occurred from 8:00 to 9:00 AM and peak departures occurred from 4:00 to 5:00 PM. From these data it is estimated that the ski area generated approximately 4,400 daily trips on this Sunday.

Historically, Sundays during the Martin Luther King holiday period are amongst the busiest ski days of the season. However, ticket sales data confirm that less than ideal weather conditions and the evening NFL football playoff activities affected skier demand on January 18, 2004. Based on sales data of 3,457 tickets, along with an adjustment for season pass holders, the total skier demand for that day is estimated at approximately 3,837 skiers.

In an attempt to characterize these data, ticket sales data for all Saturdays and Sundays during the months of January and February were researched for the most recent four ski seasons (2000-2001, 2001-2002, 2002-2003, 2003-2004). Over the four-year period, weekend ticket sales averaged 3,140 tickets in the months of January and February. Since the January 18, 2004, count day is approximately ten percent higher than the historical average weekend, it constitutes a "typical weekend day" for traffic analysis purposes.

B. PROPOSED EXPANSION – Providing additional skier terrain (75 acres), a new lift facility, and a new base lodge is intended to 1) better serve the current clientele on busy days by increasing the comfortable carrying capacity of the mountain, and 2) keep the Mount Sunapee Resort competitive in terms of market share for the long-term future.

A linear regression analysis of annual ticket sales information shows that over the last four year period, the rate of growth has been negative (-1.7% per year) due to the recent downturn in 2003-2004. Removing the most recent ski season data from the analysis indicates that the prior three year period saw positive growth on the order of 3.3 percent per year. To provide conservatively high traffic projections for future years (2010 and 2020), skier visits for the typical weekend case were compounded annually at the rate of 3.0 percent per year.

Stephen G. Pernaw & Company

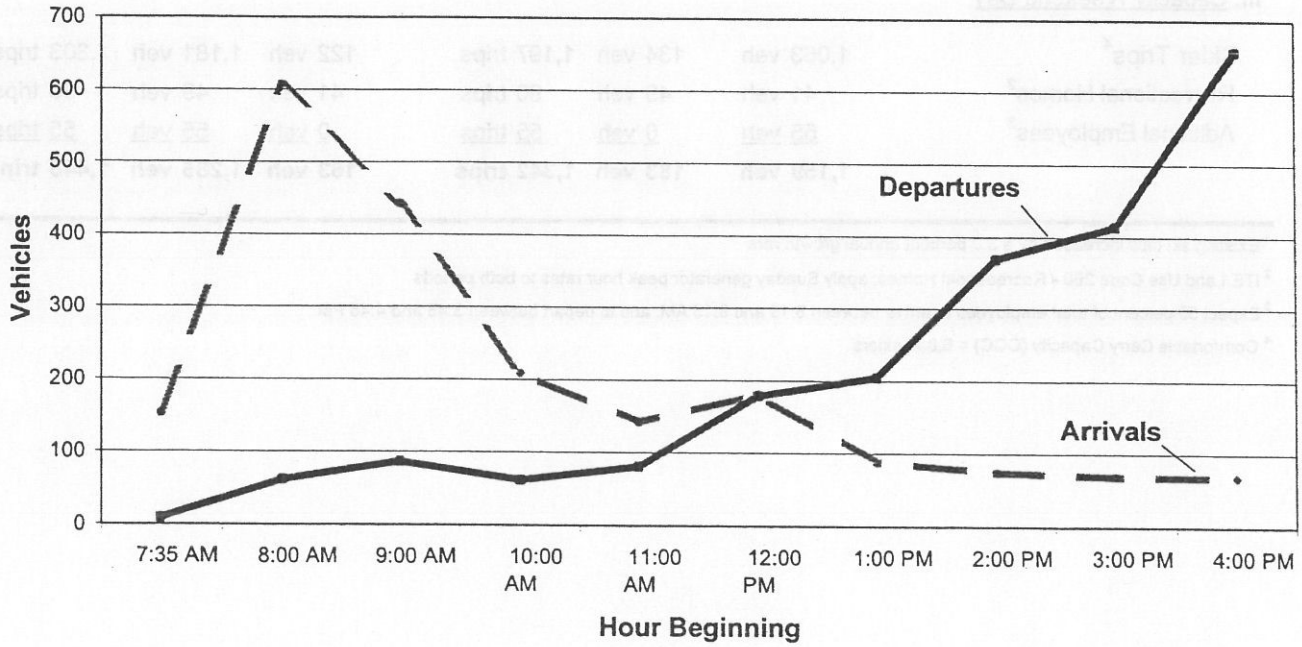
Table 1

Mount Sunapee Ski Area
Existing Site Generated Traffic Volumes

Sunday, January 18, 2004 (Martin Luther King Weekend)

	In		Out		Total	
7:35 - 8:00 AM*	218 veh	(10%)	14 veh	(1%)	232 trips	(5%)
8:00 - 9:00 AM	**607 veh**	**(29%)**	**62 veh**	**(3%)**	**669 trips**	**(16%)**
9:00 - 10:00 AM	443 veh	(21%)	87 veh	(4%)	530 trips	(13%)
10:00 - 11:00 AM	209 veh	(10%)	62 veh	(3%)	271 trips	(6%)
11:00 AM - 12:00 PM	142 veh	(7%)	81 veh	(4%)	223 trips	(5%)
12:00 - 1:00 PM	181 veh	(9%)	179 veh	(8%)	360 trips	(9%)
1:00 - 2:00 PM	88 veh	(4%)	205 veh	(10%)	293 trips	(7%)
2:00 - 3:00 PM	75 veh	(4%)	369 veh	(17%)	444 trips	(11%)
3:00 - 4:00 PM	69 veh	(3%)	414 veh	(19%)	483 trips	(11%)
4:00 - 5:00 PM	**68 veh**	**(3%)**	**657 veh**	**(31%)**	**725 trips**	**(17%)**
Sunday Total	2100 veh	(100%)	2130 veh	(100%)	4230 trips	(100%)

* Not a full hour



In addition to skiers, the West Bowl Expansion project will also generate traffic from the recreational homes (up to 250 condominium units), and additional employees (108 persons). Table 2 and Table 3 summarize the results of the trip generation analysis for the entire Mount Sunapee Resort.

Table 2 — Trip Generation Derivation

	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
I. 2010 Typical Weekend Day						
Skier Trips[1]	707 veh	89 veh	796 trips	81 veh	785 veh	866 trips
Recreational Homes[2]	41 veh	49 veh	90 trips	41 veh	49 veh	90 trips
Aditional Employees[3]	55 veh	0 veh	55 trips	0 veh	55 veh	55 trips
	803 veh	**138 veh**	**941 trips**	**122 veh**	**889 veh**	**1,011 trips**
II. 2020 Typical Weekend Day						
Skier Trips[1]	956 veh	121 veh	1,077 trips	109 veh	1,063 veh	1,172 trips
Recreational Homes[2]	41 veh	49 veh	90 trips	41 veh	49 veh	90 trips
Aditional Employees[3]	55 veh	0 veh	55 trips	0 veh	55 veh	55 trips
	1,052 veh	**170 veh**	**1,222 trips**	**150 veh**	**1,167 veh**	**1,317 trips**
III. Capacity Weekend Day						
Skier Trips[4]	1,063 veh	134 veh	1,197 trips	122 veh	1,181 veh	1,303 trips
Recreational Homes[2]	41 veh	49 veh	90 trips	41 veh	49 veh	90 trips
Aditional Employees[3]	55 veh	0 veh	55 trips	0 veh	55 veh	55 trips
	1,159 veh	**183 veh**	**1,342 trips**	**163 veh**	**1,285 veh**	**1,448 trips**

[1] Existing ski trips increased by a 3.0 percent annual growth rate

[2] ITE Land Use Code 260 - Recreational Homes; apply Sunday generator peak hour rates to both periods

[3] Expect 50 percent of total employees to arrive between 8:15 and 9:15 AM, and to depart between 3:45 and 4:45 PM

[4] Comfortable Carry Capacity (CCC) = 6,850 skiers

C. TRIP DISTRIBUTION – Identifying the various travel routes that are used by skiers is an important consideration in preparing the future traffic projections for the West Bowl Expansion project. The annual "Guest Research Summary" reports prepared for the resort have consistently shown that approximately 65 percent of the visitors have trip origins from the following counties in southeast New Hampshire and eastern Massachusetts: Merrimack, Rockingham, Hillsborough, Essex, Middlesex, Suffolk, Norfolk, and Plymouth counties. The following travel patterns were derived from intersection turning movement count data and corroborate the finding from guest research information.

Gateway	Percentage
1. NH103 (east)	46%
2. NH103-A (north)	16%
3. NH103-B (north)	21%
4. NH103 (west)	12%
5. Brook Road (south)	5%
Total	100%

The distribution of vehicle trips associated with the future additional employees and the recreational homes are expected to be similar. It should be noted that the small percentage that utilizes Brook Road for access will likely utilize the West Bowl parking lot rather then continue up to NH103 and the traffic circle. Similarly, those traveling to/from points west on NH103 will likely use both points of access to the mountain. Such trip diversions to the new facility will translate into trip reductions on NH103 and the traffic circle, whereas the additional skiers, employees, and residents translate into traffic increases. The net changes to peak period traffic flows are presented in a later section.

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D. FUTURE TRAFFIC PROJECTIONS – Since full buildout of the West Bowl expansion project may occur by 2010, this year was selected as the base year for this study. Consistent with standard practice for conducting traffic impact studies in New Hampshire, a ten-year planning horizon (2020) was selected for analysis purposes.

These projections were prepared for the "Typical Weekend Day" case and for a "Capacity Weekend Day" for both the peak arrival period (AM) and the peak departure period (PM). The following table identifies the various cases and the corresponding traffic projection figures.

	2010 Base Year		2020 Horizon Year	
	Typical Weekend	Capacity Weekend	Typical Weekend	Capacity Weekend
AM Peak Hour (Arrival Period)	Figure 8	Figure 10	Figure 12	Figure 14
PM Peak Hour (Departure Period)	Figure 9	Figure 11	Figure 13	Figure 15

These traffic projections are all inclusive in that they reflect skier vehicles, service vehicles, shuttles, employee trips, and are predicated on full occupancy of all quarter-share units. For analysis purposes, the subsequent traffic projections are based on the upper limit of 250 condominium units.

Pernaw & Company

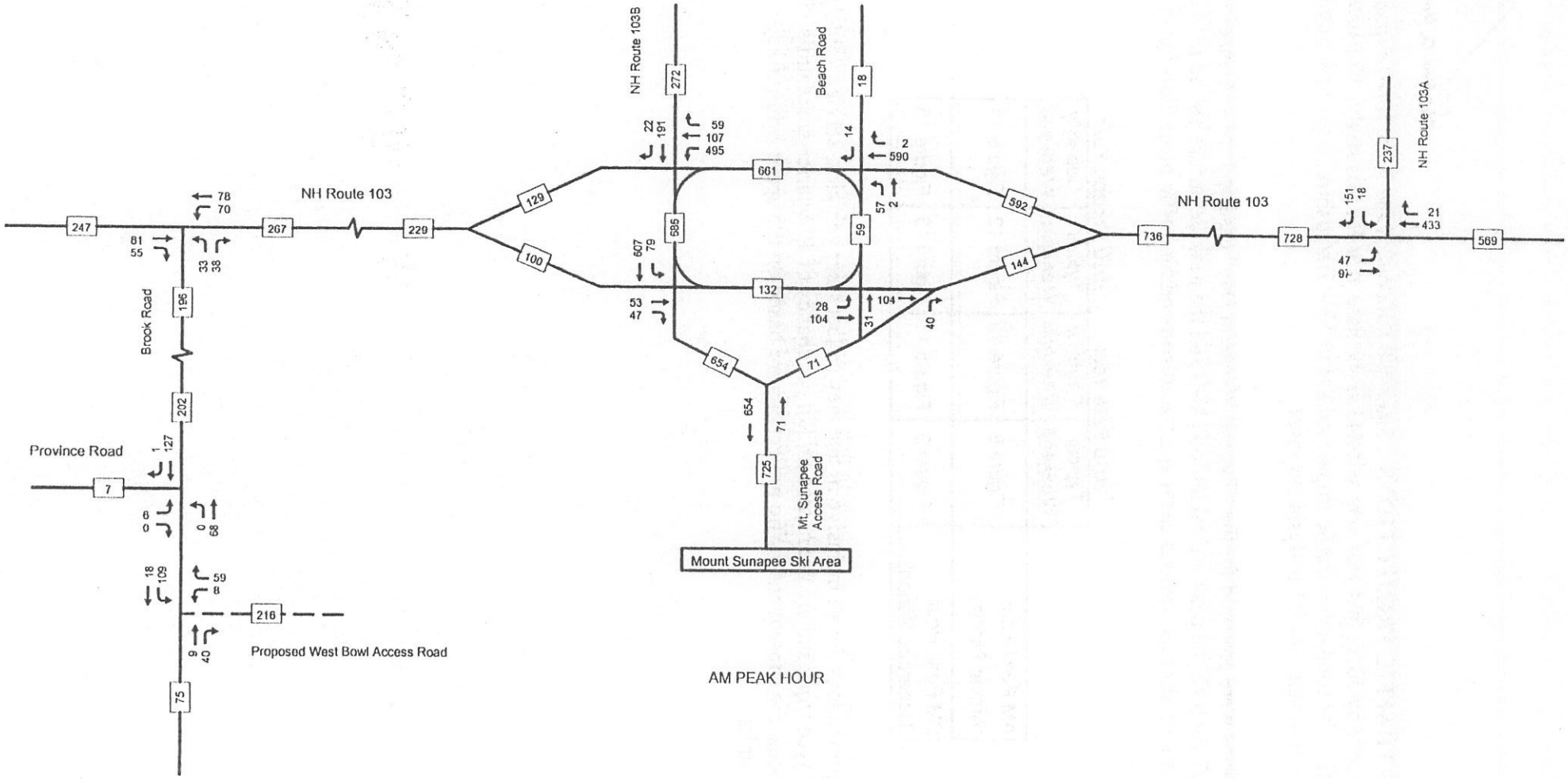

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Figure 8

2010 Typical Weekend Day Traffic Volumes - AM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

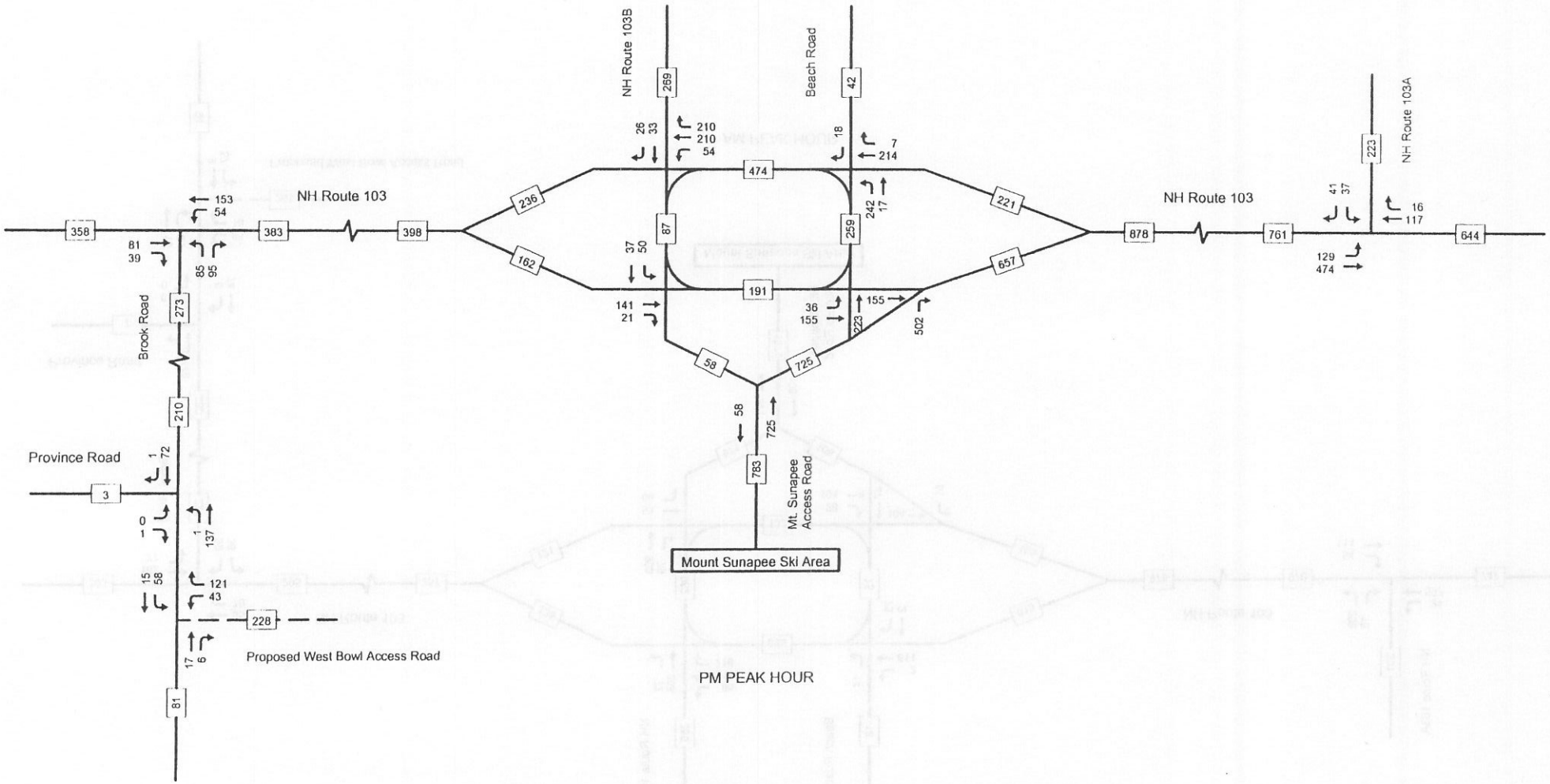

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Figure 9

2010 Typical Weekend Day Traffic Volumes - PM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

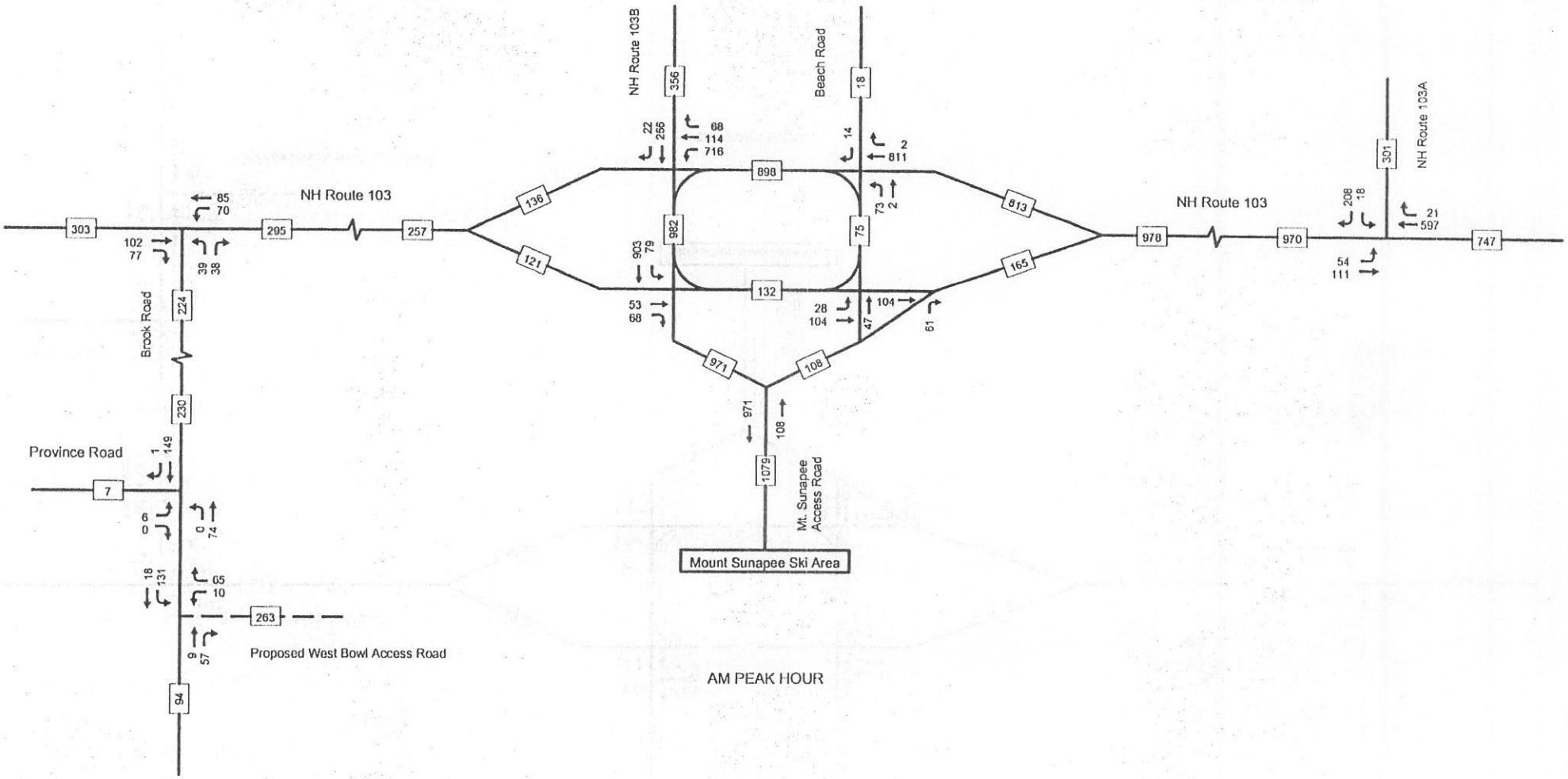

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Figure 10

2010 Capacity Day Traffic Volumes - AM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

Pernaw & Company

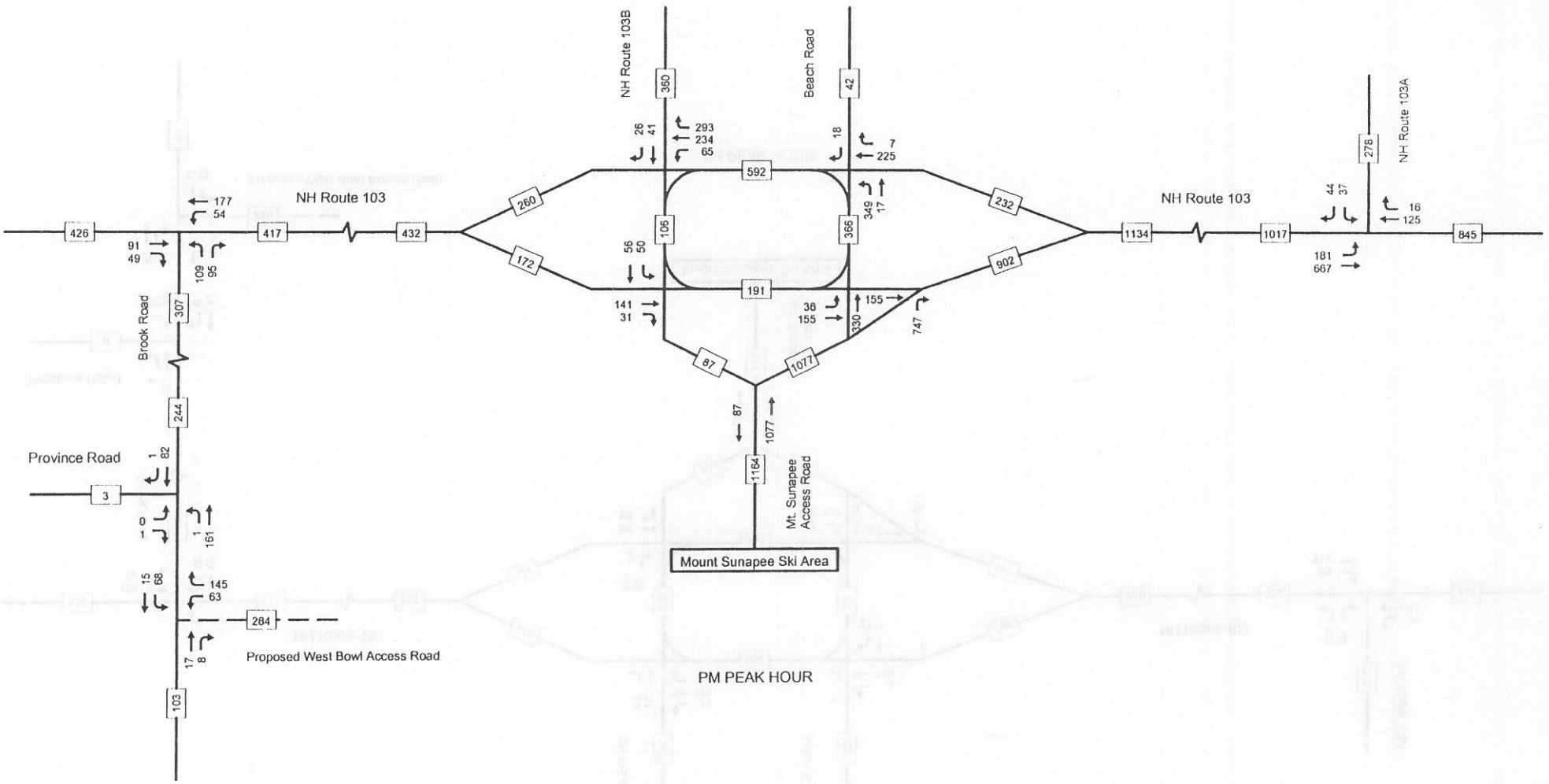

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Figure 11

2010 Capacity Day Traffic Volumes - PM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

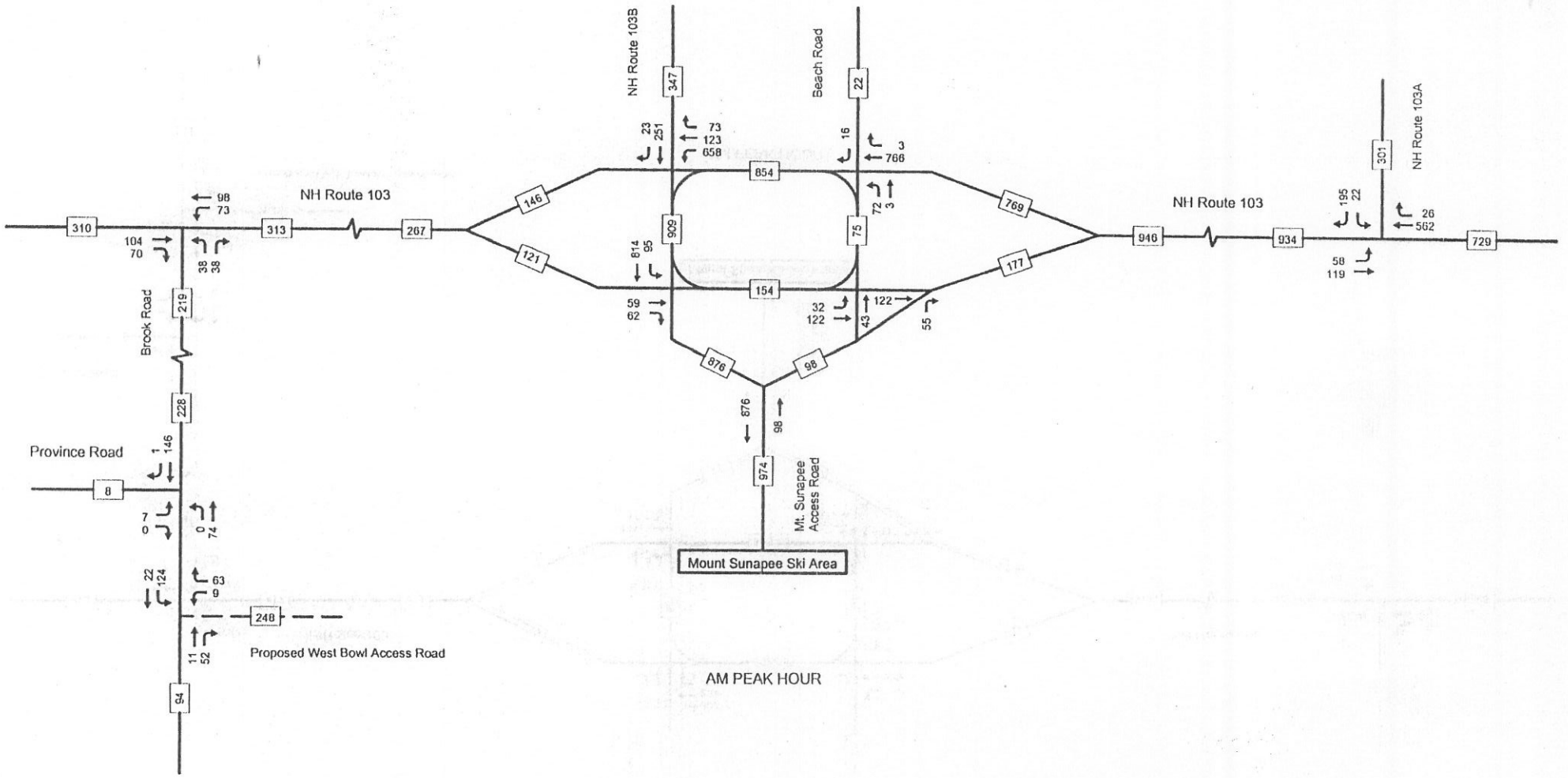

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Figure 12

2020 Typical Weekend Day Traffic Volumes - AM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

Pernaw & Company

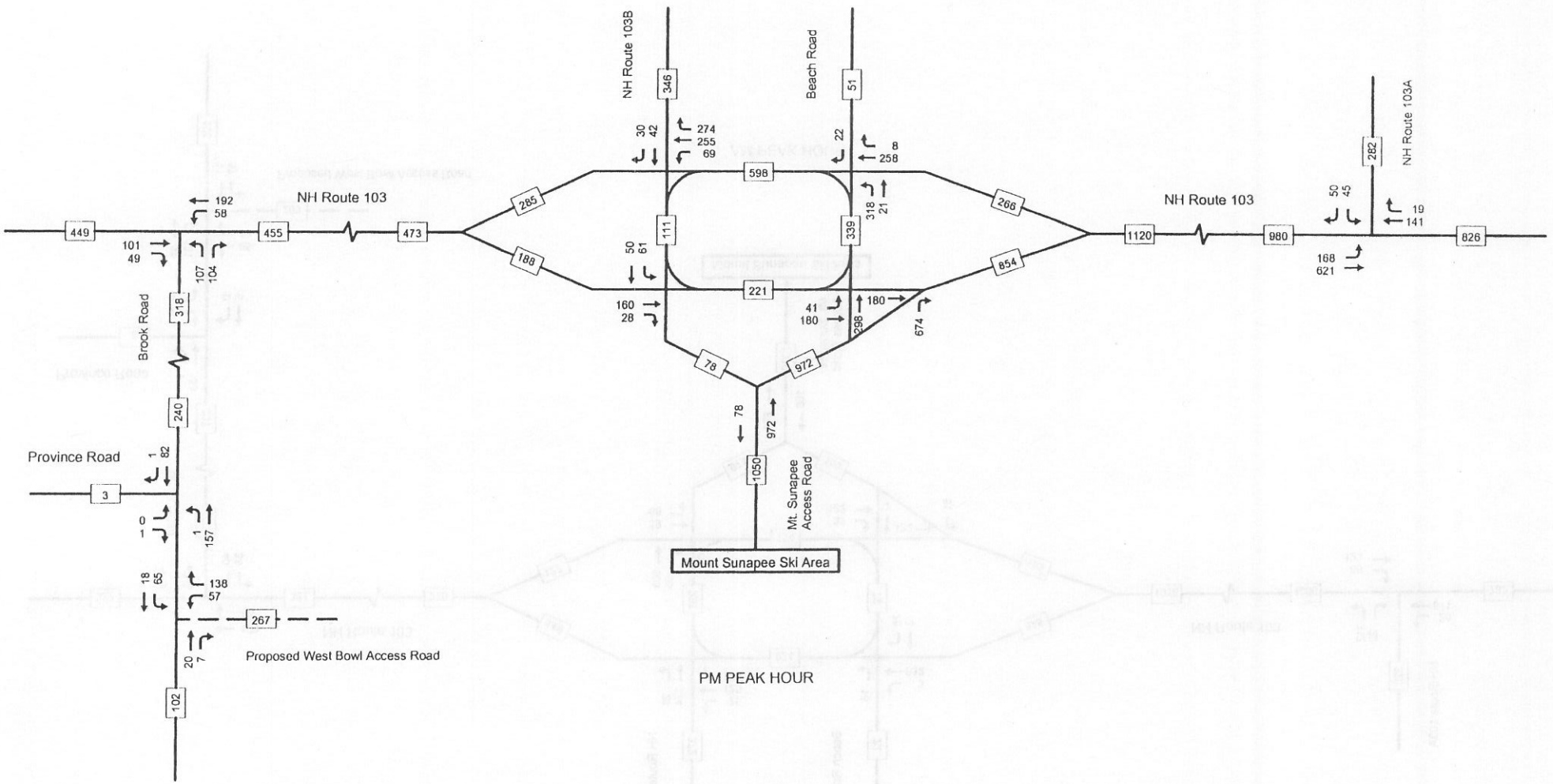

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Figure 13

2020 Typical Weekend Day Traffic Volumes - PM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

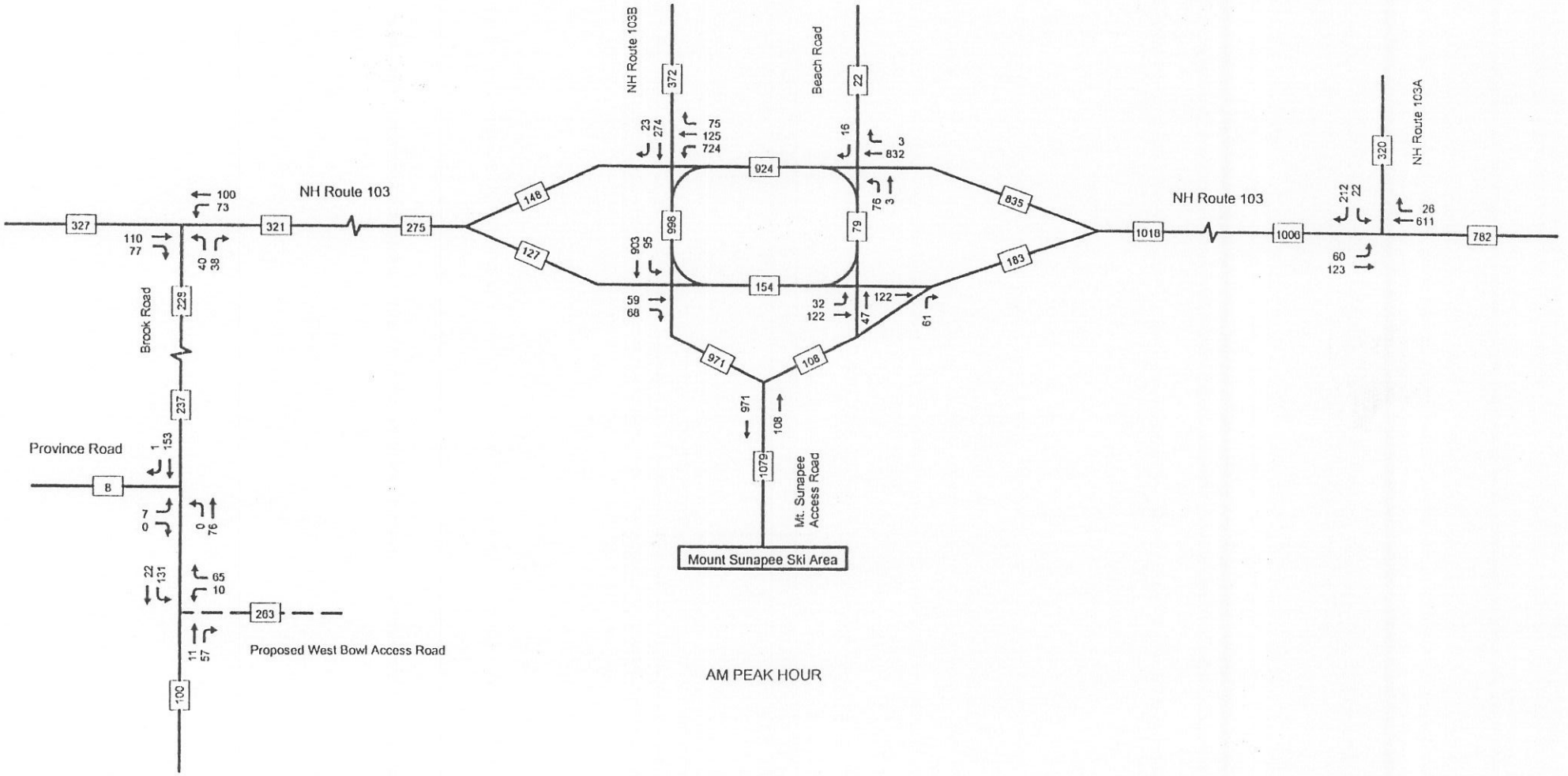

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Figure 14

2020 Capacity Day Traffic Volumes - AM Peak Hour

Traffic Impact & Site Access Study, Proposed S[illegible]rea Expansion, Newbury, New Hampshire

Pernaw & Company

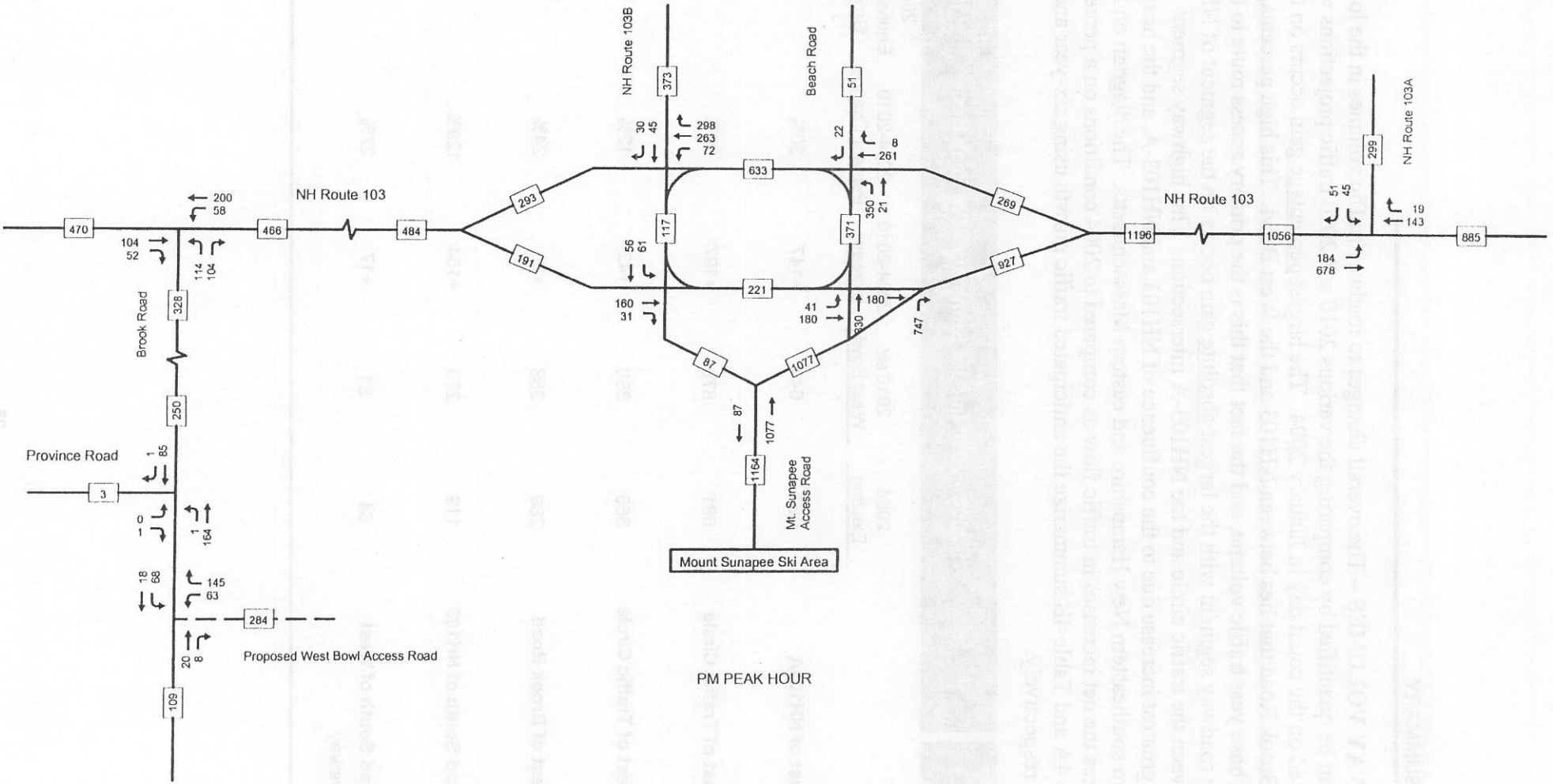

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Figure 15

2020 Capacity Day Traffic Volumes - PM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

V. IMPACT SUMMARY

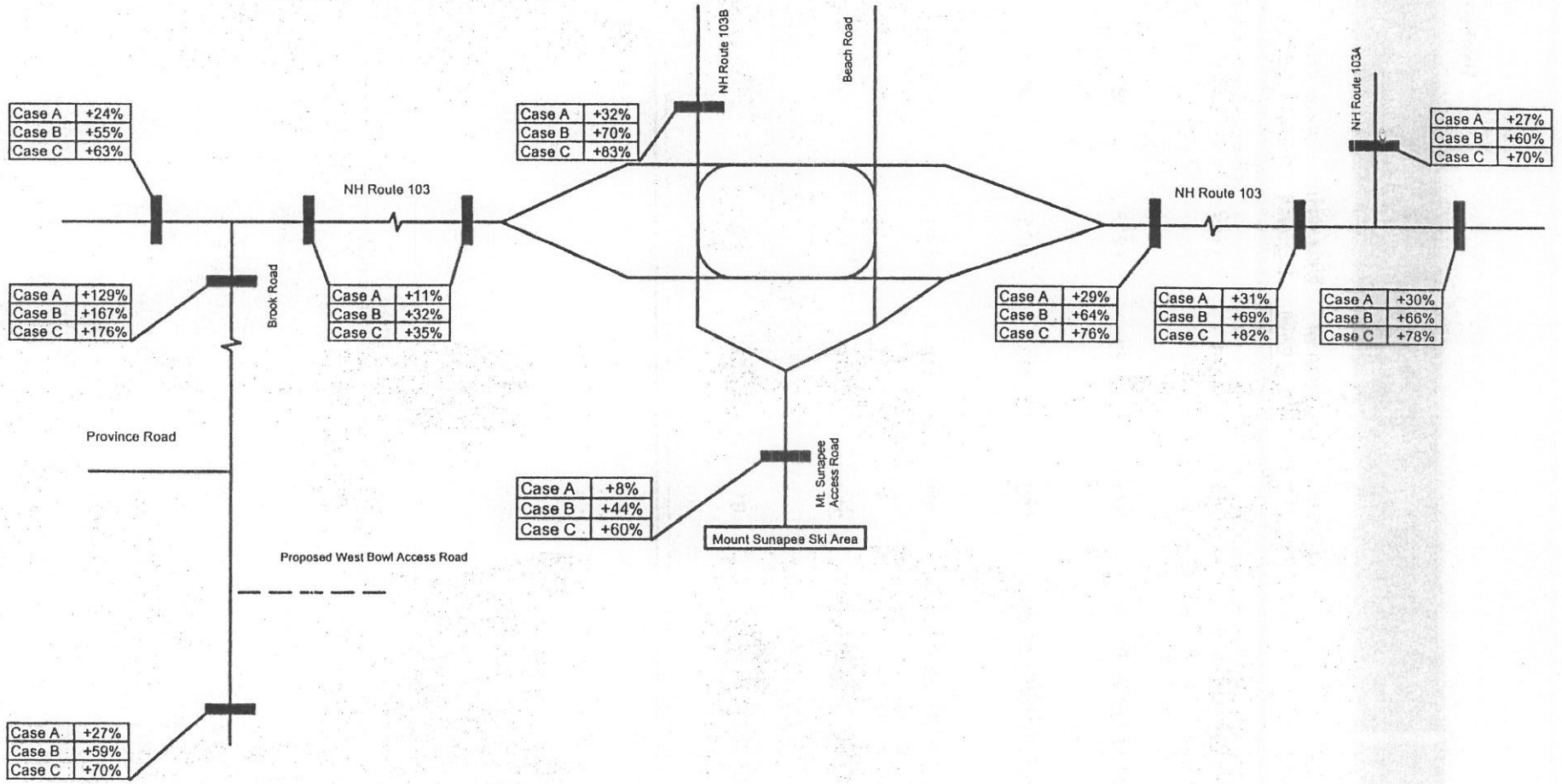
A. ROADWAY VOLUMES – The overall changes to roadway traffic volumes in the local study area can be quantified by comparing the various 2010 and 2020 traffic projections with those observed on the count day in January 2004. The largest percentage gain occurs on the segment of Brook Road that lies between NH103 and the West Bowl. This high percentage is due to a low base year traffic volume, and the fact that this is the primary access route to the new facility. The roadway segment with the largest absolute gain occurs on the segment of NH103 that lies between the traffic circle and the NH103-A intersection. This highway segment receives the greatest increase due to the confluence of NH103 and NH103-A, and the heavy draw of skiers from southeastern New Hampshire and eastern Massachusetts. The diagram on Figure 16 summarizes the net increases in traffic flow as compared to 2004 conditions on a percentage basis. Table 4A and Table 4B summarize the anticipated traffic growth using six-year and ten-year periods respectively.

Table 4A — **2004 - 2010 Impact Summary - PM Peak Hour**

Checkpoint	2004 Existing	2010 w/ West Bowl	2004-2010 Increase	2004-2010 Percent Change	2004-2010 Equivalent Annual Growth Rate
1. NH103 East of NH103A	497	644	+147	30%	4%
2. NH103 East of Traffic Circle	681	878	+197	29%	4%
3. NH103 West of Traffic Circle	356	398	+42	12%	2%
4, NH103 West of Brook Road	289	358	+69	24%	4%
5. Brook Road South of NH103	119	273	+154	129%	15%
6. Brook Road South of West Bowl Driveway	64	81	+17	27%	4%

Table 4B — **2010 - 2020 Impact Summary - PM Peak Hour**

Checkpoint	2010 w/ West Bowl	2020 w/ West Bowl	2004-2010 Increase	2004-2010 Percent Change	2004-2010 Equivalent Annual Growth Rate
1. NH103 East of NH103A	644	826	+182	28%	3%
2. NH103 East of Traffic Circle	878	1120	+242	28%	3%
3. NH103 West of Traffic Circle	398	473	+75	19%	2%
4, NH103 West of Brook Road	358	449	+91	25%	2%
5. Brook Road South of NH103	273	318	+45	16%	2%
6. Brook Road South of West Bowl Driveway	81	102	+21	26%	2%



Case A - 2004 Count Day versus 2010 Typical Weekend Day
Case B - 2004 Count Day versus 2020 Typical Weekend Day
Case C - 2004 Count Day versus 2020 Capacity Weekend Day

NORTH

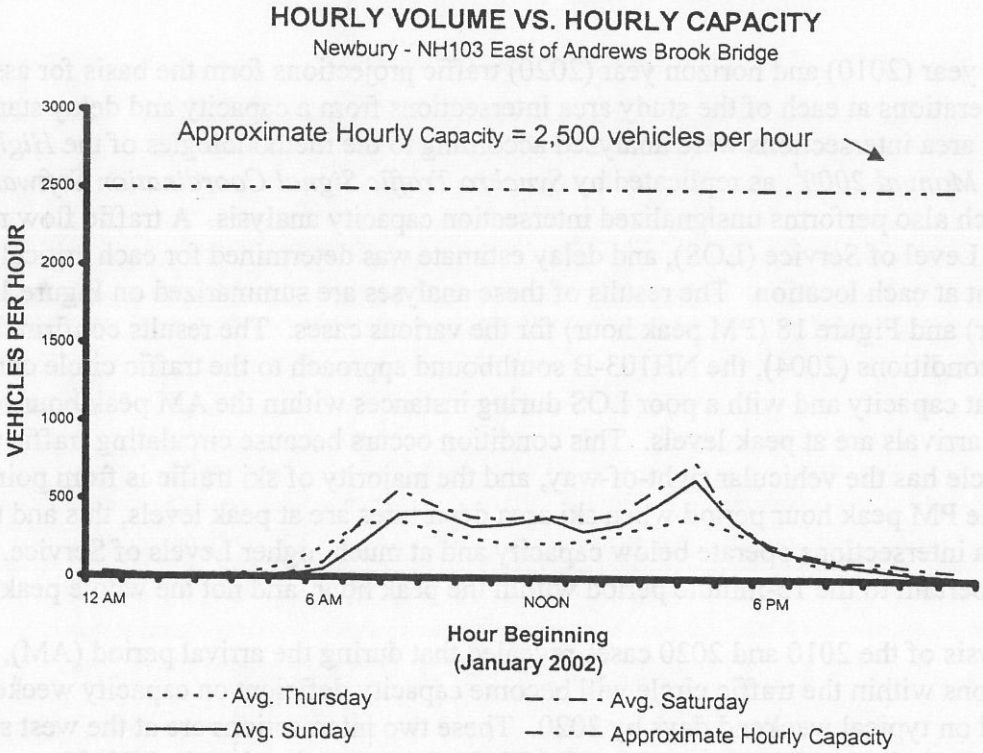
Figure 16

Traffic Volume Increases (2004 vs. Future Years) - PM Peak Hour Case

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

B. ROADWAY CAPACITY – The term "roadway capacity" in this case refers to the maximum sustained hourly flow rate at which vehicles can reasonably be expected to traverse a uniform two-lane section under a set of roadway and traffic conditions. The capacity of a two-lane highway is 1,700 passenger cars per hour in each direction, with a maximum of 3,200 for travel in both directions. Taking into account that NH103 follows a rolling terrain (is not level) and that it accommodates a mix of passenger cars and trucks, the hourly capacity is conservatively estimated at approximately 2,500 vph (total both directions).

The future traffic projections for 2020 on Figure 15 indicate that the two-way traffic volume on NH103 is less than 1,200 vph during worst-case conditions. Accordingly, this two-lane section of NH103 exhibits ample capacity to accommodate the future traffic volumes during the ski season. There is no need to widen NH103 to a four-lane highway as a result of future growth at Mount Sunapee. The following diagram compares the hourly traffic volumes on NH103 at the permanent recorder station (east of Andrews Brook Bridge) with the approximate capacity of the highway. This graph shows that roadway capacity is not a constraint.



C. INTERSECTION CAPACITY – In addition to roadway capacity, intersections themselves have separate capacities and in some cases they can affect the flow of traffic on a particular roadway segment. Capacity and Level of Service (LOS) calculations pertaining to unsignalized intersections with STOP and YIELD sign control address the quality of service for those vehicles turning into and out of intersecting side streets. The availability of adequate gaps in the traffic stream on the major street actually controls the potential capacity for vehicle movements to and

from the intersecting side streets and driveways. Levels of Service are simply letter grades (A-F) that categorize the vehicle delays associated with specific turning maneuvers. Table 5 describes the criteria used in this analysis.

Table 5 — Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Control Delay (seconds/vehicle)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

Source: Transportation Research Board, Highway Capacity Manual 2000.

The base year (2010) and horizon year (2020) traffic projections form the basis for assessing traffic operations at each of the study area intersections from a capacity and delay standpoint. All study area intersections were analyzed according to the methodologies of the *Highway Capacity Manual 2000*[1], as replicated by *Synchro Traffic Signal Coordination Software (Version 6.0)*, which also performs unsignalized intersection capacity analysis. A traffic flow rate, capacity, Level of Service (LOS), and delay estimate was determined for each critical traffic movement at each location. The results of these analyses are summarized on Figure 17 (AM peak hour) and Figure 18 (PM peak hour) for the various cases. The results confirm that under existing conditions (2004), the NH103-B southbound approach to the traffic circle currently operates at capacity and with a poor LOS during instances within the AM peak hour period, when ski arrivals are at peak levels. This condition occurs because circulating traffic within the traffic circle has the vehicular right-of-way, and the majority of ski traffic is from points east. During the PM peak hour period when ski area departures are at peak levels, this and the other study area intersections operate below capacity and at much higher Levels of Service. These analyses pertain to the 15-minute period within the peak hour, and not the whole peak hour.

The analysis of the 2010 and 2020 cases revealed that during the arrival period (AM), two intersections within the traffic circle will become capacity deficient on capacity weekend days in 2010, and on typical weekend days by 2020. These two intersections are at the west side of the circle and include the NH103 (westbound)/NH103-B intersection and the NH103 (EB)/Circulating Ramp intersection. Analysis of the departure period (PM) indicates that the Mount Sunapee Access Road "slip ramp" to NH103 (eastbound) will experience congestion by 2020 on capacity days only. The remaining study area intersections will operate below capacity through the horizon year 2020, with the expanded ski area in full operation, and all quarter-share condominium units fully occupied.

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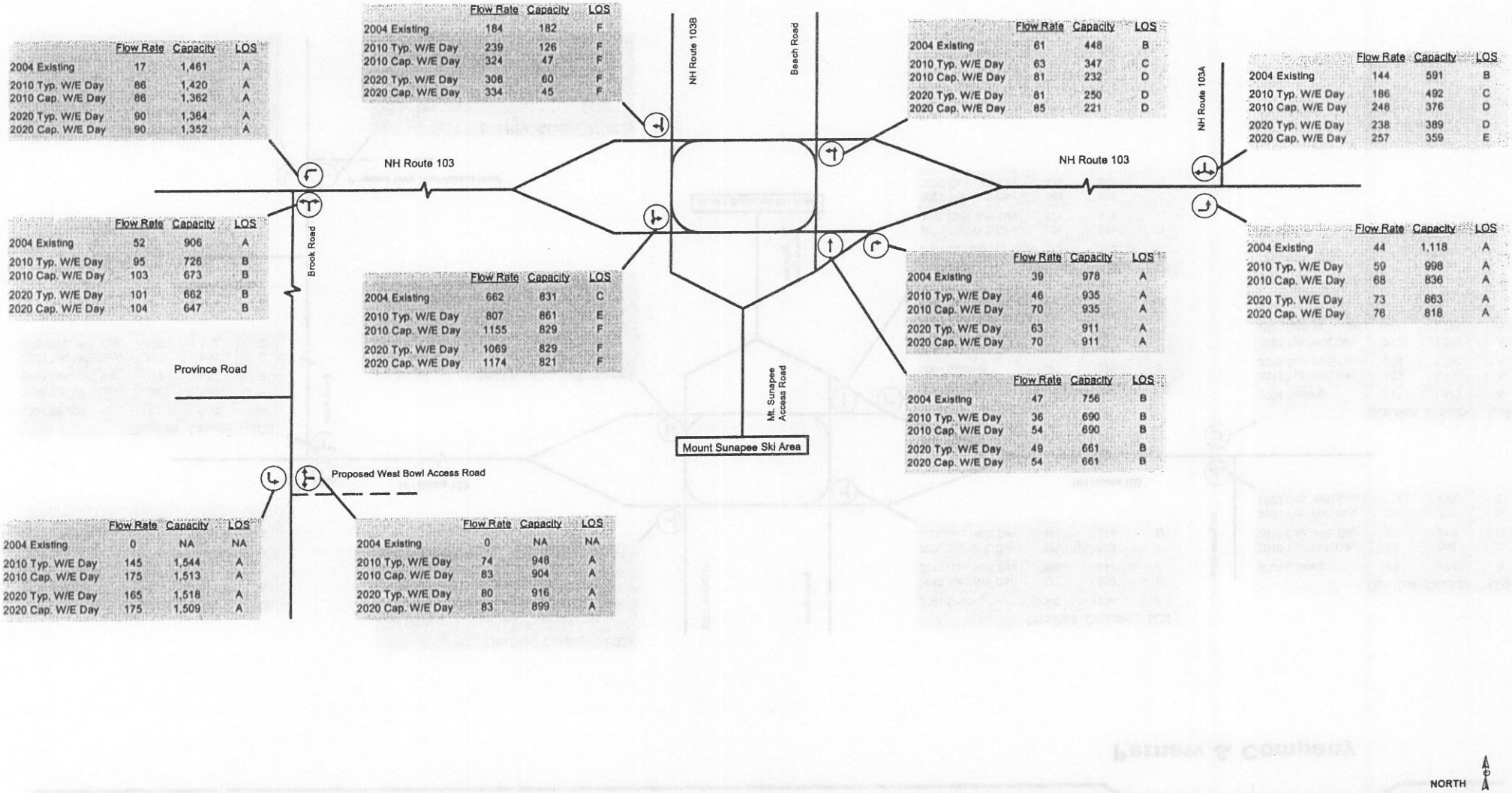
[1] Transportation Research Board, *Highway Capacity Manual* (Washington, D.C., 2000).



	Flow Rate	Capacity	LOS
2004 Existing	17	1,461	A
2010 Typ. W/E Day	86	1,420	A
2010 Cap. W/E Day	86	1,362	A
2020 Typ. W/E Day	90	1,364	A
2020 Cap. W/E Day	90	1,352	A

	Flow Rate	Capacity	LOS
2004 Existing	184	182	F
2010 Typ. W/E Day	239	126	F
2010 Cap. W/E Day	324	47	F
2020 Typ. W/E Day	308	60	F
2020 Cap. W/E Day	334	45	F

	Flow Rate	Capacity	LOS
2004 Existing	61	448	B
2010 Typ. W/E Day	63	347	C
2010 Cap. W/E Day	81	232	D
2020 Typ. W/E Day	81	250	D
2020 Cap. W/E Day	85	221	D

	Flow Rate	Capacity	LOS
2004 Existing	144	591	B
2010 Typ. W/E Day	186	492	C
2010 Cap. W/E Day	248	376	D
2020 Typ. W/E Day	238	389	D
2020 Cap. W/E Day	257	359	E

	Flow Rate	Capacity	LOS
2004 Existing	52	906	A
2010 Typ. W/E Day	95	726	B
2010 Cap. W/E Day	103	673	B
2020 Typ. W/E Day	101	662	B
2020 Cap. W/E Day	104	647	B

	Flow Rate	Capacity	LOS
2004 Existing	662	831	C
2010 Typ. W/E Day	807	861	E
2010 Cap. W/E Day	1155	829	F
2020 Typ. W/E Day	1069	829	F
2020 Cap. W/E Day	1174	821	F

	Flow Rate	Capacity	LOS
2004 Existing	39	978	A
2010 Typ. W/E Day	46	935	A
2010 Cap. W/E Day	70	935	A
2020 Typ. W/E Day	63	911	A
2020 Cap. W/E Day	70	911	A

	Flow Rate	Capacity	LOS
2004 Existing	44	1,118	A
2010 Typ. W/E Day	59	998	A
2010 Cap. W/E Day	68	836	A
2020 Typ. W/E Day	73	863	A
2020 Cap. W/E Day	76	818	A

	Flow Rate	Capacity	LOS
2004 Existing	47	756	B
2010 Typ. W/E Day	36	690	B
2010 Cap. W/E Day	54	690	B
2020 Typ. W/E Day	49	661	B
2020 Cap. W/E Day	54	661	B

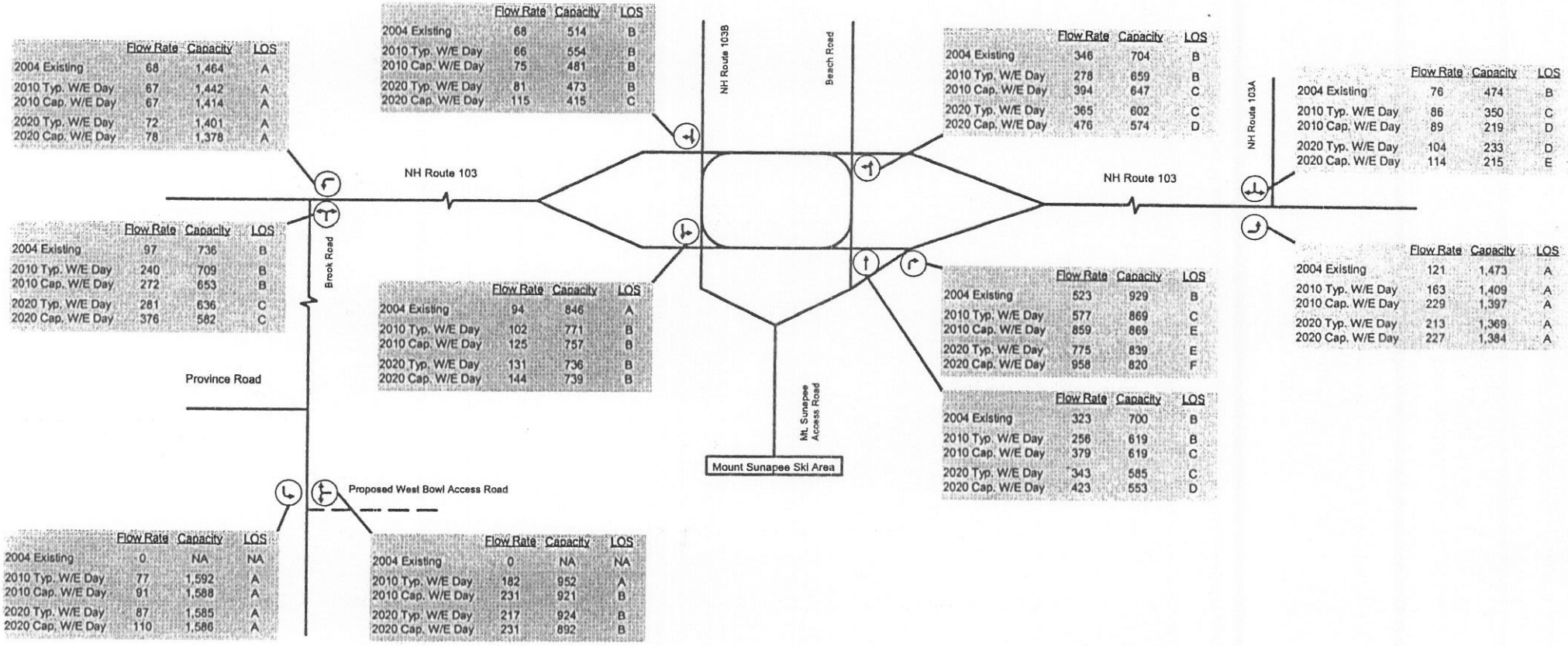
	Flow Rate	Capacity	LOS
2004 Existing	0	NA	NA
2010 Typ. W/E Day	145	1,544	A
2010 Cap. W/E Day	175	1,513	A
2020 Typ. W/E Day	165	1,518	A
2020 Cap. W/E Day	175	1,509	A

	Flow Rate	Capacity	LOS
2004 Existing	0	NA	NA
2010 Typ. W/E Day	74	948	A
2010 Cap. W/E Day	83	904	A
2020 Typ. W/E Day	80	916	A
2020 Cap. W/E Day	83	899	A

Figure 17

Stop & Yield Controlled Intersection Capacity Analysis Summary - AM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire



	Flow Rate	Capacity	LOS
2004 Existing	68	1,464	A
2010 Typ. W/E Day	67	1,442	A
2010 Cap. W/E Day	67	1,414	A
2020 Typ. W/E Day	72	1,401	A
2020 Cap. W/E Day	78	1,378	A

	Flow Rate	Capacity	LOS
2004 Existing	68	514	B
2010 Typ. W/E Day	66	554	B
2010 Cap. W/E Day	75	481	B
2020 Typ. W/E Day	81	473	B
2020 Cap. W/E Day	115	415	C

	Flow Rate	Capacity	LOS
2004 Existing	346	704	B
2010 Typ. W/E Day	278	659	B
2010 Cap. W/E Day	394	647	C
2020 Typ. W/E Day	365	602	C
2020 Cap. W/E Day	476	574	D

	Flow Rate	Capacity	LOS
2004 Existing	76	474	B
2010 Typ. W/E Day	86	350	C
2010 Cap. W/E Day	89	219	D
2020 Typ. W/E Day	104	233	D
2020 Cap. W/E Day	114	215	E

	Flow Rate	Capacity	LOS
2004 Existing	97	736	B
2010 Typ. W/E Day	240	709	B
2010 Cap. W/E Day	272	653	B
2020 Typ. W/E Day	281	636	C
2020 Cap. W/E Day	376	562	C

	Flow Rate	Capacity	LOS
2004 Existing	94	846	A
2010 Typ. W/E Day	102	771	B
2010 Cap. W/E Day	125	757	B
2020 Typ. W/E Day	131	736	B
2020 Cap. W/E Day	144	739	B

	Flow Rate	Capacity	LOS
2004 Existing	523	929	B
2010 Typ. W/E Day	577	869	C
2010 Cap. W/E Day	859	869	E
2020 Typ. W/E Day	775	839	E
2020 Cap. W/E Day	958	820	F

	Flow Rate	Capacity	LOS
2004 Existing	121	1,473	A
2010 Typ. W/E Day	163	1,409	A
2010 Cap. W/E Day	229	1,397	A
2020 Typ. W/E Day	213	1,369	A
2020 Cap. W/E Day	227	1,384	A

	Flow Rate	Capacity	LOS
2004 Existing	323	700	B
2010 Typ. W/E Day	256	619	B
2010 Cap. W/E Day	379	619	C
2020 Typ. W/E Day	343	585	C
2020 Cap. W/E Day	423	553	D

	Flow Rate	Capacity	LOS
2004 Existing	0	NA	NA
2010 Typ. W/E Day	77	1,592	A
2010 Cap. W/E Day	91	1,588	A
2020 Typ. W/E Day	87	1,585	A
2020 Cap. W/E Day	110	1,586	A

	Flow Rate	Capacity	LOS
2004 Existing	0	NA	NA
2010 Typ. W/E Day	182	952	A
2010 Cap. W/E Day	231	921	B
2020 Typ. W/E Day	217	924	B
2020 Cap. W/E Day	231	892	B

Figure 18

Stop & Yield Controlled Intersection Capacity Analysis Summary - PM Peak Hour

Traffic Impact & Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

To improve traffic operations at these temporary bottleneck locations, the following off-site mitigation is recommended.

- Widen the north side of the traffic circle between NH103-B and the Beach Access Road intersection to provide two westbound travel lanes; one shared lane for through movements (on NH103 westbound) and right-turns (onto NH103-B), and the other an exclusive lane for circulating traffic that is destined for the ski area.
- During the peak ARRIVAL period on weekends only, utilize police officer control from 8:15 to 9:15 AM at two locations within the traffic circle. The vehicular right-of-way needs to be controlled at the NH103 (westbound)/NH103-B intersection and the adjacent NH103 (eastbound)/Circulating Ramp intersection in order for approaching vehicles to traverse the traffic circle efficiently.
- During the peak DEPARTURE period on weekends only, utilize police officer control from 3:45 to 4:45 PM at one location within the traffic circle. Controlling the vehicular right-of-way at the NH103 (eastbound)/Access Road intersection will indirectly create adequate gaps in the traffic stream for skiers exiting onto NH103 (eastbound) via the nearby "slip ramp."

Use of police office control may delay the need for the physical modifications to the traffic circle; however, these should be completed prior to the horizon year 2020. The use of temporary police office control is expected to be needed on capacity days only in 2010, and on typical weekend days by 2020. Coordination between the Mount Sunapee Resort and the Newbury Police Department would ensure that police details are not used on weekend days with below normal skier demand (due to weather or other conditions).

Analysis of these intersections with the recommended traffic mitigation in place is summarized on Figure 19. With police officer control, traffic operations will be similar to traffic signal control. The following table summarizes the criteria used in this type of analysis. The analysis demonstrates that all traffic movements will operate below capacity and at reasonable Levels of Service on capacity weekend days through the horizon year 2020, with the West Bowl expansion project in full operation.

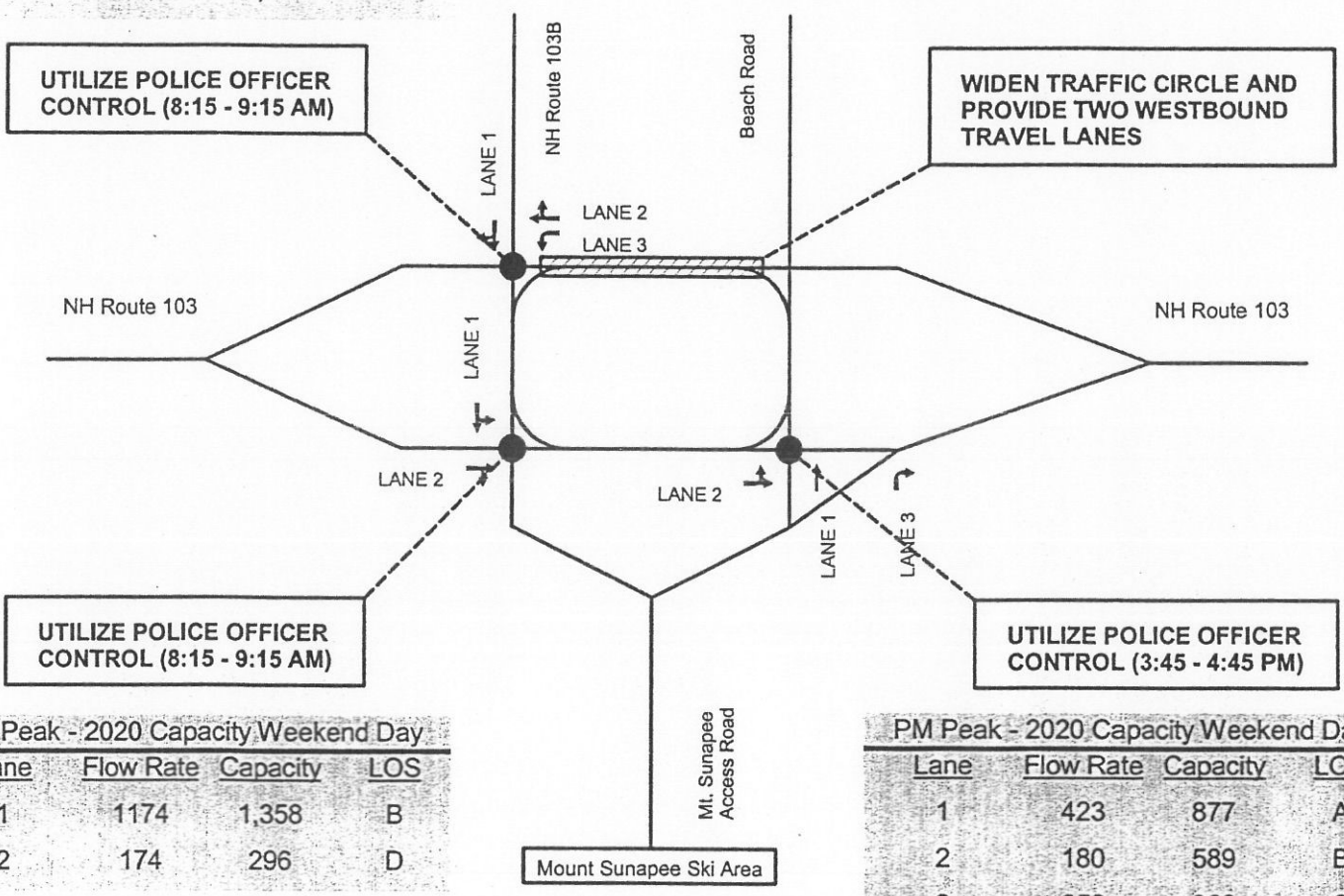
Table 6 — Level-of-Service Criteria for Signalized Intersections (Police Officer Control)

Level of Service	Control Delay (seconds/vehicle)
A	< 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

Source: Transportation Research Board, Highway Capacity Manual 2000.

AM Peak - 2020 Capacity Weekend Day

Lane	Flow Rate	Capacity	LOS
1	334	466	D
2	222	1,166	A
3	804	1,174	B



AM Peak - 2020 Capacity Weekend Day

Lane	Flow Rate	Capacity	LOS
1	1174	1,358	B
2	174	296	D

PM Peak - 2020 Capacity Weekend Day

Lane	Flow Rate	Capacity	LOS
1	423	877	A
2	180	589	B
3	958	969	C

78601

Figure 19

Intersection Capacity Analysis Summary With Mitigation

Traffic Impact and Site Access Study, Proposed Ski Area Expansion, Newbury, New Hampshire

D. OTHER STREETS AND DRIVEWAYS – NH103 is punctuated with many residential driveways, commercial driveways, and local street intersections that operate in an uncontrolled fashion. The section of NH103 that extends between the traffic circle and the NH103-A intersection will receive the greatest increase due to the West Bowl expansion project for reasons stated earlier. For example, during the PM peak hour, the two-way traffic volume on this section of highway is expected to increase from 681 vehicles in 2004, to 878 vehicles in 2010, with the West Bowl in full operation. A generic intersection analysis, that is applicable to any intersecting street or driveway, shows that the increased delays for other vehicles (non-skiers) using these streets and driveways is nominal.

GENERALIZED DRIVEWAY DELAYS ON NH103 - PM Peak Hour Period

	2004 Existing	2010 w/West Bowl	Increased Control Delay
Typical Left-Turn Delay (from minor street)	14.4 sec	17.7 sec	+3.3 sec/veh
Typical Right-Turn Delay (from minor street)	11.8 sec	13.4 sec	+1.6 sec/veh
Typical Left-Turn Arrival Delay (to minor street from NH103)	0.1 sec	0.1 sec	neg

In all cases there is triple digit capacity for each of the critical turning movements at these other streets and driveways on NH103. It should be noted that the increase in delay is not a result of the West Bowl expansion project alone, but is also affected by normal background traffic growth by non-skiers.

E. BROOK ROAD – The width and condition of Brook Road is varied over its entire length between NH103 in Sunapee and NH10 in Goshen. The post development traffic projections for 2020 show that the section north of the West Bowl parking lot will accommodate a total of 250-330 vehicles during peak periods. The section immediately south of the West Bowl complex will accommodate approximately 110 vehicles on a peak hour basis.

Based on these anticipated traffic loads, and a design speed of 35 miles per hour, the minimum suggested pavement width for Brook Road is 24 feet (between NH103 and West Bowl), and 22 feet to the south of West Bowl. In all cases, graded shoulders are considered to be desirable.

Brook Road is a State maintained facility. Accordingly, a driveway permit from the NHDOT, District 2 will be required to construct the proposed driveway on Brook Road for the West Bowl area. Analysis of the traffic projections contained herein demonstrates that a single shared approach lane is sufficient on each leg of the Brook Road/West Bowl driveway intersection. Intersection sight distances at the proposed driveway will need to be evaluated at the driveway permit stage.

F. TECHNICAL APPENDIX – A separate technical appendix includes traffic data, growth rate calculations, and capacity analyses that were performed in the course of this study.

VI. SUMMARY OF FINDINGS AND CONCLUSIONS

The Mount Sunapee Ski Resort in Newbury, New Hampshire currently offers 62 slopes and trails on 230 skiable acres that are serviced by ten ski lifts. Vehicular access to the mountain is provided by a single access road that intersects NH Route 103 at the Mount Sunapee traffic circle. The West Bowl expansion project includes adding approximately 75 acres of terrain that is skiable from the main summit, a new lift facility, a new base lodge, and 175 to 250 quarter-share condominium units. These improvements will increase the comfortable carrying capacity of the ski area to approximately 6,850 skiers, and is intended to better serve existing skier demand and maintain market share for the long-term future. Vehicular access to the new West Bowl facility is proposed via a two-way driveway that will intersect the east side of Brook Road in Goshen, at a point approximately 2.1 miles south of NH103 in Sunapee, New Hampshire.

The traffic counts that were collected at the traffic circle on Sunday, January 18, 2004 (Martin Luther King holiday weekend) revealed that the ski area generated 669 vehicle-trips (594 in, 75 out) during the peak ARRIVAL period from 8:15 to 9:15 AM, and 728 vehicle-trips (68 in, 660 out) during the peak DEPARTURE period from 3:45 to 4:45 PM. Due to weather and other conditions, this particular count is representative of a typical weekend day.

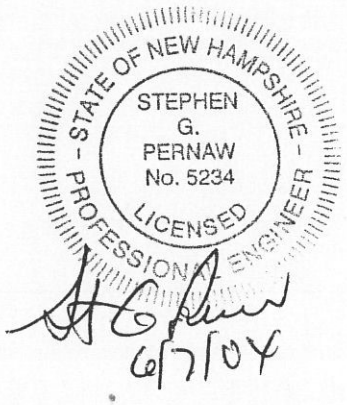
Future traffic projections were prepared for 2010 (base year = project completion) and 2020 (horizon year) for the entire study area, and reflect both typical weekend day and capacity weekend day conditions. By 2020, the Mount Sunapee Resort is expected to generate a total of 1,222 (AM) and 1,317 (PM) peak hour trips on a typical weekend day with the condominium units completely occupied. Under this scenario, the West Bowl driveway will accommodate approximately 248 (AM) and 267 (PM) trips. This translates into approximately 20 percent of the total trips utilizing the new access point on Brook Road, and the remaining 80 percent utilizing the existing access road at the traffic circle.

An intersection capacity and Level of Service analysis of all study area intersections using the 2020 traffic projections revealed that traffic operations and capacity deficiencies will occur at two locations within the traffic circle during the arrival period, and at one location during the departure period. To mitigate these situations, a combination of roadway widening along a portion of the traffic circle is necessary, along with police officer control from 8:15 to 9:15 AM (two persons) and 3:45 to 4:45 PM (one person) on typical winter weekends. For the base year case (2010), the need for police officer control will likely be limited to capacity weekend days only. In terms of roadway capacity, the two lane section of NH103 was found to be appropriate, and it will operate well below capacity on winter weekend days through 2020 and beyond, with the West Bowl Expansion project in full operation.

At the multitude of intersecting streets and driveways along the NH103 corridor (east of Mount Sunapee), the net increase in through traffic (due to ski area expansion and normal background growth) will result in longer delays for those using these various points of access during peak arrival and departure periods. Analysis of a generic case shows that increase in such delays will be limited, and on the order of an additional 2-4 seconds of delay per side-street vehicle, when comparing 2004 existing conditions with 2010 (full expansion). In the case of Brook Road,

capacity conditions do not govern; however, the minimum roadway width should be 24 feet on the section between NH103 and the West Bowl driveway, and 22 feet south of the driveway, based on the anticipated traffic volumes and a thirty-five mile per hour design speed.

With implementation of the basic measures and recommendations contained herein, vehicular access to and from the Mount Sunapee Resort as proposed, will be reasonably safe and efficient from a traffic engineering and operations standpoint. Both the recommended modifications to the traffic circle and the proposed driveway on Brook Road will require the review and approval of the New Hampshire Department of Transportation – District 2 through the Driveway Permit system.



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Preliminary Wildlife and Wildlife Habitat Assessment
Mount Sunapee Resort -- West Bowl Expansion

General

Field work to determine the presence of wildlife and the potential for significant habitats was undertaken on 4 and 13 May 2004. In both instances, investigations began at the summit, the first day concentrating on the area proposed for the ski lift, the second day concentrating on areas to the south and west. On both occasions, observations were made during a 'wander search', with objectives to note any wildlife or wildlife sign, and to characterize the vegetative cover and potential wildlife habitat.

On 4 May, snow cover from a storm the night before extended from the summit to about 750 meters elevation. The day was cool but with increasing sunshine and light wind. The second day, 13 May, was warm and sunny with light wind. Between the two dates, the season had advanced significantly, with development of leaves and spring flora much more evident by 13 May.

Land Use

There is little evidence of past human activity on the upper slopes, with the exception of the hiking trail. Although apparently undisturbed for many years, the number of large trees is small. At ca. 600 meter elevation, a few scattered yellow birch (Betula alleghaniensis) measuring as much as 87 cm. diameter (34.25 inches) were noted, but most trees are of modest height and diameter. The coniferous forest on a rocky shoulder near the state park boundary contains a few large red spruce (Picea rubens) but such trees are uncommon on the project site.

Uniformity of cover type found at higher elevations is missing below ca. 550 meters where recent cutting has taken place, and evidence of old logging roads and fencelines is found. The southern edge of the study area is bounded by a stone wall, indicating that one side or both was once cleared land. Clearings have grown to brush (primarily brambles, pin cherry and aspen), and the general aspect is of a diverse but broken canopy. The base area is a combination of broken woodlots, old field association and remnant orchards typical of once-settled farmland.

Old growth, as described in Neid, et al. (2003) was not observed on the study area. Isolated large trees were exceptionally uncommon, as noted above. The forest cover above 550 meters was generally uniform in height and apparent age, with a sparse shrub understory. There are few downed logs or dead snags in this forest, indicating a relatively even-aged forest that has developed since logging occurred prior to 1924.

Vegetative Cover

From summit to base, the dominant forest changes in distinct bands from coniferous growth at the summit, northern hardwoods between ca 780 and 480 meters elevation, and mixed growth below 480 meters. The summit forest is primarily spruce-fir (*Picea rubens* and *Abies balsamea*) with numerous birches (*Betula papyrifera*). The northern hardwood community includes beech (*Fagus grandifolia*), paper birch (*Betula papyrifera*), yellow birch (*B. alleghaniensis*) and black cherry (*Prunus serotina*), with sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), hophornbeam (*Ostrya virginiana*) and aspen (*Populus tremuloides*) increasingly common at lower elevations. Below 510 meters, stands of hemlock (*Tsuga canadensis*) and scattered red oak (*Quercus rubra*) appear, and in the vicinity of the proposed base facilities, white pine (*Pinus Strobus*) is common.

The high elevation coniferous woods has an understory of small trees of overstory species along with hobblebush (*Viburnum alnifolium*) mountain maple (*Acer spicatum*), red maple (*Acer rubrum*) and mountain ash (*Sorbus americana*) and a mossy ground cover which includes wood sorrel (*Oxalis montana*), Canada mayflower (*Maianthemum canadensis*), blue-bead lily (*Clintonia borealis*), wild sarsaparilla (*Aralia nudicaulis*) and goldthread (*Coptis groenlandica*).

The northern hardwood forest is open, with little in the way of saplings or understory shrubs except for striped maple (*Acer pensylvanicum*) and scattered hobblebush. Typical spring flowers such as Canada mayflower, false Solomon's-seal (*Smilacina racemosa*), Indian-cucumber (*Medeola virginiana*), purple trillium (*Trillium erectum*), painted trillium (*T. undluatum*), twisted-stalk (*Streptopus roseus*), bellwort (*Uvularia sessilifolia*) and yellow violet (*Viola rotundifolia*) occur sporadically in these woods, with blue-bead lily becoming uncommon at lower elevations. Ferns (*Osmunda claytoniana, O. regalis, O. cinnamomea, Thelypteris noveboracensis* and *Polystichum acrostichoides*) occur in the hardwood forests, as do clubmosses (*Huperzia lucidula, Diphasiastrum digitatum, Lycopodium obscurum* and *L. annotinum*).

The lower section of northern hardwood forest has been logged in the past, and regeneration includes sprouts and saplings of the trees listed above, along with shadbush (*Amelanchier* spp.) and pin cherry (*Prunus pensylvanica*). Hayscented fern (*Dennstaedtia punctilobula*) and bracken (*Pteridium aquilinum*) are common in logged forests and clearings.

Lower elevation forests contain a greater diversity of species. All the higher-elevation species are present, with the addition sweet birch (*Betula lenta*), apple (*Malus pumila*), cottonwood (*Populus deltoides*) and basswood (*Tilia americana*). Several shrub species absent on upper slopes are common at lower elevations, including meadowsweet (*Spiraea latifolia*), steeplebush (*S. tomentosa*), brambles (*Rubus idaeus*, R. *alleghaniensis* and *R. occidentalis*), willows (*Salix* spp.), choke cherry (*Prunus virginiana*) and hawthorn (*Crataegus* sp.). Weedy non-native species are common at the base.

One species listed on the New Hampshire Natural Heritage Bureau proposed list of Endangered, Threatened, Watch, Extirpated and Intermediate Plant Species was noted during field work. A single butternut tree (*Juglans cinerea*) occurs on the north side of the existing access road off Brook Road. The area appears to have been an old house site, and there are likely to be additional butternuts nearby. Butternut is of concern because of the threat posed by canker dieback (*Melanconis juglandis*), a widespread fungus disease that weakens and then kills the tree. The tree noted at Brook Road can likely be avoided and therefore not be affected by the project.

Wildlife Observations

The greatest concentration of wildlife sign was observed in the area where logging operations have recently taken place. While occasional evidence of moose (primarily scat) was noted as high on the mountain as 700 meters, such sign is abundant in the upper area of the cut. In addition, there are localize areas of concentrated bark stripping (mostly on red and striped maple) and browsing on maples, ash, aspen and elm. Evidence of deer was sporadic, consisting of widely scattered pellet groups and occasional browsing.

Pine and hemlock stands at lower elevations were investigated specifically to determine whether there was evidence of use by overwintering deer. The stands tend to be small and fragmented, and the overstory does not appear to be dense enough to prevent deep snows from accumulating or to shield the interior from winter winds. Hemlock foliage, within reach of deer, remained unbrowsed. No deer sign was noted in these stands.

No trees scarred by bears were noted during field work, and potential denning sites appear to be limited to areas with ledges and tumbled stone at higher elevations. Such an area was observed on a small spruce-covered promontory at ca. 700 meters near the southern edge of the project area. Talus-like rocks on the west side of this area could provide shelter for hibernating bears, although no indication of such use was seen (Photo 1). This area is south of the southernmost proposed ski trail, and would not be affected by the project as I understand it.

Bird life at Mount Sunapee is typical of deep forest environments at this latitude. Because field work was conducted in early to mid-May, much of the spring migration had not occurred, however, and most birds observed were resident species (hairy and downy woodpeckers (*Picoides villosus* and *P. pubescens*), chickadees (*Parus atricapillus*), blue jays (*Cyanocitta cristata*), ruffed grouse (*Bonasa umbellus*). Ovenbirds (*Seiurus aurocapillus*) are common in the northern hardwood forests. The extensive hardwood forests can be expected to provide habitat for numerous migratory and resident species.

Two partial twig nests were noted in tops of beech trees near the hiking trail at ca. 660 meters (Photo 2). There was no evidence of recent use (fresh twigs, feathers or droppings near the nests, so it was assumed that they were built last year. Being incomplete, the nests were not identifiable as to species. The fact that there were two nests, in trees that

did not stand appreciably above the general canopy, would tend to eliminate raptors as the builders, and I conclude that they were most likely built by great blue herons (*Ardea herodias*).

Miscellaneous observations included evidence of porcupine (*Erethizon dorsatum*) in a small hovel beside a tote road, and a red-bellied snake (*Storeria occipitomaculata*) at ca. 480 meter elevation.

Summary

With the exception of a few scattered large trees, the area appears to have a history of timber operations: prior to 1924 on state park lands, and within the past 20 years on remaining properties. No areas answering to the description of old growth forests as used in Neid, et al. (2003) were observed.

One plant species of concern to the New Hampshire Natural Heritage Bureau was noted next to Brook Road. A single butternut tree occurs at an old house site north of the existing access road, but it appears to be far enough from the road not to be affected by improvements that might take place on the existing footprint. Before work is done, the tree (and any others nearby) should be flagged and a suitable protective buffer established.

The most significant wildlife observation was the two twig nests, possibly built by great blue herons, in tree tops at ca. 660 meters near the Summit Hiking Trail. Neither nest appeared to be finished or under active construction, but their presence indicates potential use of these woods for nesting by such birds. If the nests were active, a large buffer zone would be recommended within which no human activity should take place. Here, however, the birds who built these nests were acclimated to an active hiking trail lies a few yards away.

Wildlife on this parcel is typical of large wooded tracts in the state. Moose are the most obvious large animal, and the species is having impacts on woody plant succession where there is concentrated activity. A broad zone at ca. 540 meters (the upper edge of areas that have seen logging operations) is heavily used by moose, and ash, maples, elms, yellow birches and hophornbeams are especially affected by browsing. Bark stripping on striped maple and red maple is locally common.

Deer sign is light across most of the site, with pellet groups and evidence of browsing uncommon. Areas used by deer as overwintering habitat was not observed on the project area. Pine and hemlock stands occur at the lowest elevations, but they are fragmented and have relatively open canopies. In most instances where hemlocks, a favored browse species, occurs, foliage at heights available to deer showed only sporadic evidence of browsing.

Conclusions

The principal impact of the proposed ski trail development on wildlife will be the fragmentation of a relatively uniform forest. Certain deep-woods species of birds may be affected, depending on the width of the trails, but the number of species is likely to be increased as extensive "edge" habitat is created on both sides of all trails. In addition, the trails themselves will offer openland habitat that is currently not available.

Edge habitat will also provide ample browse for deer and moose, and both species can be expected to increase in numbers. There should be minimal impact on other species of resident mammals.

Literature Cited

Neid, S.L., D.D. Sperduto and K.F. Crowley. 2003. Natural Heritage Inventory of the East Bowl at Mount Sunapee State Park. A report submitted to the State of New Hampshire by the New Hampshire Natural Heritage Bureau. DRED Division of Forests & Lands and the Nature Conservancy. Concord.

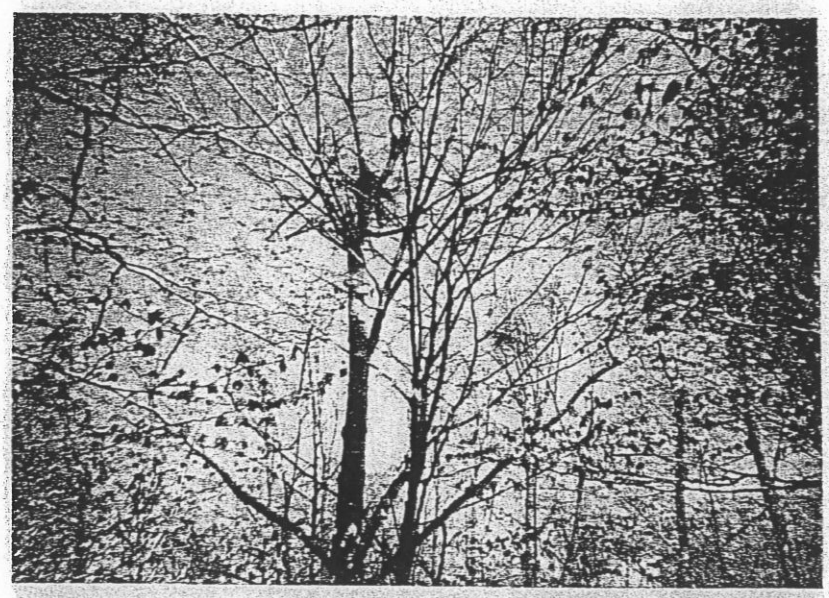


Photo 1. Partial twig nests in beech trees, near Summit Hiking Trail at ca. 660 meters.



Isolated rock at ca. 675 meters, midway between proposed lift line and park boundary. With the exception of a rocky promontory at ca. 700 meters near the southern edge of the project area, such rock was rare, but could offer denning sites for black bear.

Characteristic Plant Species
Mount Sunapee West Bowl Expansion

TREES

Eastern white pine	*Pinus strobus*	Scattered mid-slope, in stands at base
Eastern hemlock	*Tsuga canadensis*	Scattered mid-slope and below, occasionally in small stands
Balsam fir	*Abies balsamea*	Co-dominant at higher elevations
Red spruce	*Picea rubens*	Co-dominant at higher elevations, scattered individuals at mid-slope
Trembling aspen	*Populus tremuloides*	Minor component at lower elevations
Bigtooth aspen	*Populus grandidentata*	Scattered
Butternut	*Juglans cinerea*	One tree near Goshen Road entrance
Hophornbeam	*Ostrya virginiana*	Minor component at lower elevations
Black birch	*Betula lenta*	Uncommon
Yellow birch	*Betula alleghaniensis*	Co-dominant in mid to upper level deciduous woods
Paper birch	*Betula papyrifera*	Co-dominant at high elevations, common at mid-slope
Gray birch	*Betula populifolia*	Lower elevations
Beech	*Fagus grandifolia*	Common, often dominant, component of northern hardwood stands
Red oak	*Quercus rubra*	Minor component in NHW stands
American elm	*Ulmus americana*	Minor component, lower elevations
Mountain ash	*Sorbus americana*	Common at higher elevations
Shadbush	*Amelanchier* sp.	Occasional
Black cherry	*Prunus serotina*	Common species, lower mid-slopes and above
Hawthorn	*Crataegus* sp.	Uncommon; lower elevations
Apple	*Malus pumila*	Lower elevations (old farm sites)
Striped maple	*Acer pensylvanicum*	Common species lower mid-slopes and above
Sugar maple	*Acer saccharum*	Common below conifer belt
Red maple	*Acer rubrum*	Common
Basswood	*Tilia americana*	Uncommon, below mid-slope
White ash	*Fraxinus americana*	Common on bottom 2/3 of mountain

SHRUBS

Willows	*Salix* spp.	Occasional, along watercourses
Beaked hazelnut	*Corylus cornuta*	Common mid-slope and below
Currant	*Ribes* sp.	Occasional
Meadowsweet	*Spiraea latifolia*	Frequent, mid-slope and below
Steeplebush	*Spiraea tomentosa*	Uncommon, lower slopes
Shadbush	*Amelanchier* sp.	Occasional, lower 2/3 of mountain
Blackberry	*Rubus alleghaniensis*	Frequent
Black raspberry	*Rubus occidentalis*	Lower elevations
Raspberry	*Rubus idaeus*	Lower elevations
Dewberry	*Rubus hispidus*	Lower elevations
Choke cherry	*Prunus virginiana*	Near base
Pin cherry	*Prunus pensylvanica*	Common from mid-slope & below

Mountain maple	*Acer spicatum*	Common understory tree
Low sweet blueberry	*Vaccinium angustifolium*	Clearings at lower elevations
Elderberry	*Sambucus* sp.	Scattered
Hobblebush	*Viburnum alnifolium*	Abundant at higher elevations
Mtn fly honeysuckle	*Diervilla lonicera*	Occasional

HERBACEOUS

Shining clubmoss	*Huperzia lucidula*	Common at higher elevations
Ground-cedar	*Diphasiastrum digitatum*	Occasional at lower elevations
Princess-pine	*Lycopodium obscurum*	Occasional at lower elevations
Bristly clubmoss	*Lycopodium annotinum*	Occasional
Long beech-fern	*Phegopteris conectilis*	Occasional
Cinnamon fern	*Osmunda cinnamomea*	Common
Interrupted fern	*Osmunda Claytoniana*	Common
Hay-scented fern	*Dennstaedtia punctilobula*	Common in cutover areas
Sensitive fern	*Onoclea sensibilis*	Common at lower elevations
Bracken	*Pteridium aquilinum*	Common in clearings & edges
Canada mayflower	*Maianthemum canadense*	Common
False hellebore	*Veratrum viride*	Occasional in wet sites
Blue-bead lily	*Clintonia borealis*	Common, esp. at upper elevations
Purple trillium	*Trillium erectum*	Occasional
Painted trillium	*Trillium undulatum*	Uncommon
Indian-cucumber	*Medeola virginiana*	Common
Twisted-stalk	*Streptopus roseus*	Occasional in hardwood forests
Bellwort	*Uvularia sessilifolia*	Common
False Solomon's seal	*Smilacina racemosa*	Common
Goldthread	*Coptis groenlandica*	Common
Buttercup	*Ranunculus acris*	Common at lower elevations
Partridgeberry	*Mitchella repens*	Occasional
Blue-eyed grass	*Sisyrinchium montanum*	Occasional
Starflower	*Trientalis borealis*	Common
Mountain sorrel	*Oxalis montana*	Common at higher elevations
Sarsaparilla	*Aralia nudicaulis*	Common
Cinquefoil	*Potentilla simplex*	Common at lower elevations
Strawberry	*Fragaria virginiana*	Common at lower elevations
Yellow violet	*Viola rotundifolia*	Common at higher elevations
White violet	*Viola blanda*	Occasional, damp openings
Blue violet	*Viola* sp.	Occasional
St. John's-wort	*Hypericum perfoliatum*	Occasional
Beechdrops	*Epifagus virginiana*	Occasional under *Fagus*
Bunchberry	*Cornus canadensis*	Occasional
Indian-pipe	*Monotropa uniflora*	Occasional
Speedwell	*Veronica officinalis*	Disturbed areas at lower elevations
Rough goldenrod	*Solidago rugosa*	Common at lower elevations
Ox-eye daisy	*Chrysanthemum leucanthemum*	Common, lower elevations

APPENDIX C

WILDLIFE PROTECTION NOTES:

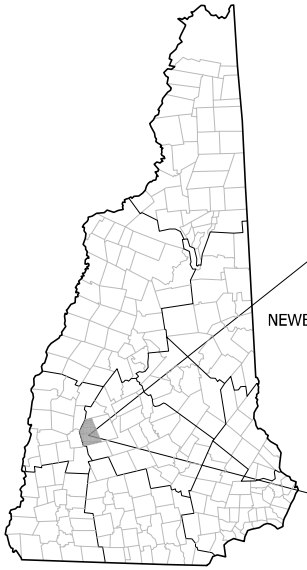
- ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV. EMAIL SUBJECT LINE: NHB22-3045; MT. SUNAPEE PARKING LOT EXPANSION, WILDLIFE SPECIES OBSERVATION.
- PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHF&G IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION AS FEASIBLE.
- IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHF&G AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHF&G, IF ANY, TO ASSURE THE PROJECT DOES NOT APPRECIABLY JEOPARDIZE THE CONTINUED EXISTENCE OF THREATENED AND ENDANGERED SPECIES AS DEFINED IN FIS 1002.04.
- THE NHF&G, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

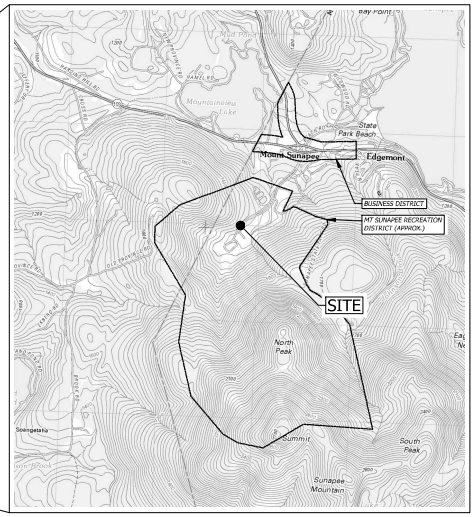
VAIL RESORTS

MOUNT SUNAPEE RESORT
PARKING EXPANSION

NEWBURY, NEW HAMPSHIRE

MARCH 2023





LOCATION PLAN

SCALE: 1" = 2000'

OWNER:

STATE OF NEW HAMPSHIRE C/O
VAIL RESORTS ATTN: PETER DISCH
1398 ROUTE 103
NEWBURY, NEW HAMPSHIRE 03255

SURVEYOR & ENGINEER:

horizons Engineering
176 NEWPORT ROAD, SUITE 8
NEW LONDON, NH 03257
(603) 877-0116

WETLAND & SOIL SCIENTIST

LUKE HURLEY, CSS
c/o BSC GROUP
150 DOW STREET
MANCHESTER, NH 03101

PERMIT APPROVALS

THIS PROJECT SHALL COMPLY WITH ALL CONDITIONS OF ALL PERMITS FOR THE PROJECT. COPIES OF THESE PERMITS MAY BE REQUESTED FROM THE HEI NEW LONDON OFFICE.

TOWN OF NEWBURY SITE PLAN REVIEW	THIS PLANSET
NHDES ALTERATION OF TERRAIN PERMIT	*PENDING*
NHDES WETLAND IMPACT PERMIT	*PENDING*

SHEET LIST:

	COVER SHEET
C1.00	PROJECT NOTES AND LEGEND
C1.01	EXISTING CONDITIONS PLAN
C2.01	SITE LAYOUT PLAN
C2.02	SITE GRADING AND DRAINAGE PLAN
C3.01, 3.02	EROSION CONTROL NOTES AND DETAILS
C3.03	MISCELLANEOUS NOTES AND DETAILS
C3.04	PARKING LOT 2 BIORETENTION AREA DETAILS
C3.05	PARKING LOT 2 CHAMBER SYSTEM DETAILS
C3.06	PARKING LOT 4 CHAMBER SYSTEM DETAILS

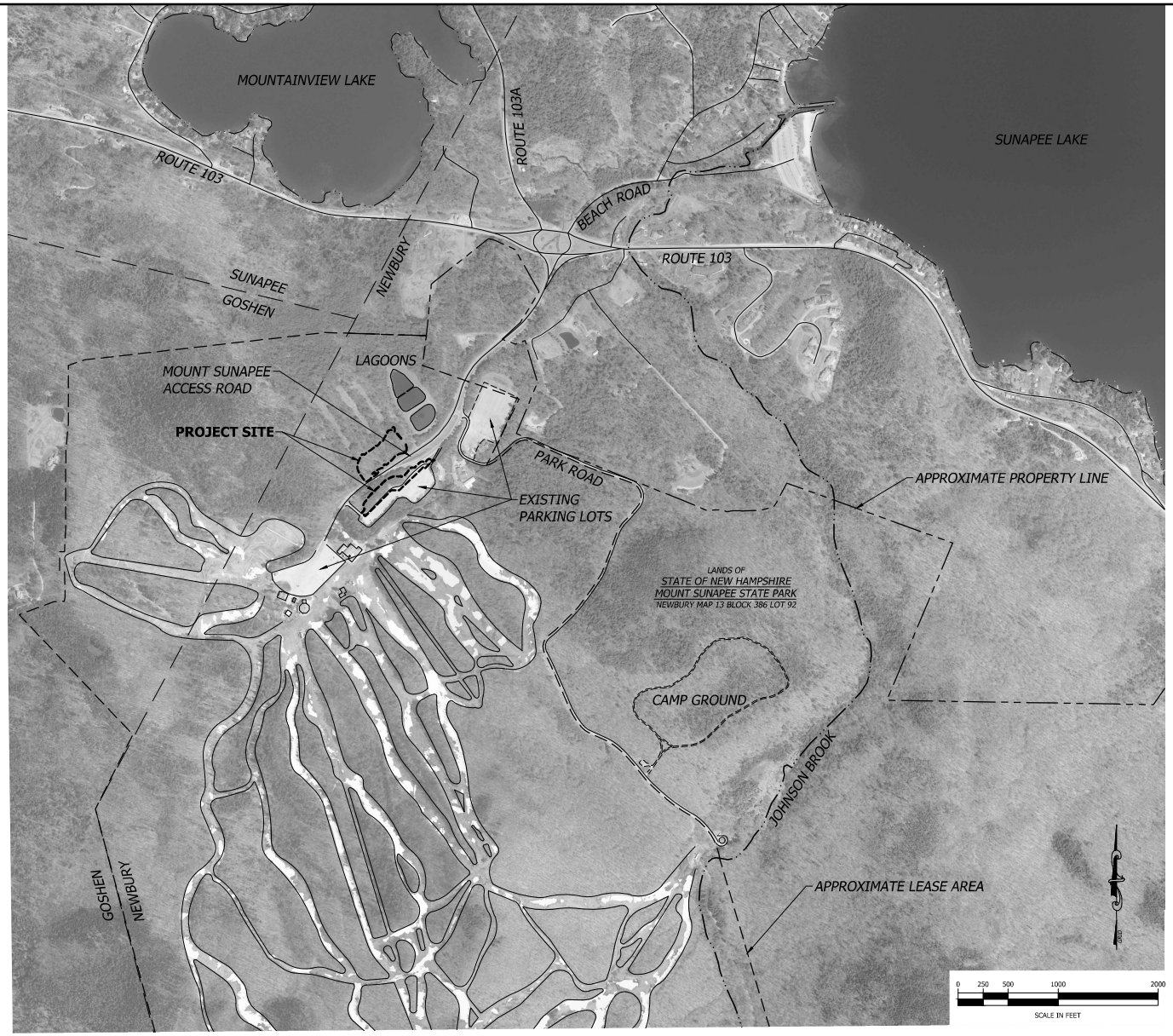
APPROVAL DATE: _____

TOWN OF NEWBURY, N.H. PLANNING BOARD

CHAIR

USE APPLIED FOR:
BASE LODGE FACILITIES

DATE OF PRINT
APRIL 25 2023
HORIZONS ENGINEERING



EXISTING | PROPOSED

- MAJOR CONTOUR
- MINOR CONTOUR
- TREE LINE
- EDGE OF WETLAND
- STONE WALL
- GUARD RAIL
- DRAIN LINE
- SEWER LINE
- WATER LINE
- WATER SHUT-OFF
- WETLAND FLAG
- POST
- ROAD SIDE REFLECTOR
- SIGN
- CABLE CABINET
- CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE
- MONITORING WELL
- TEST PIT LOCATION AND #
- INFILTRATION TEST AND #
- PHOTO LOCATION
- SITE SPECIFIC SOIL LINE / ID
- NRCS SOIL LINE / ID

GENERAL NOTES

1. OWNER OF RECORD:

   STATE OF NH - DNCR
   ATTN: LANDS MANAGEMENT
   172 PEMBROKE ROAD
   CONCORD, NH 03301

2. REFERENCE PLANS:

   A. "REVISED LEASE AREA SUNAPEE STATE PARK" SURVEYED AND PREPARED BY THE STATE OF NEW HAMPSHIRE D.R.E.O. LAST REVISED FEBRUARY 5, 2015 AND RECORDED IN THE MERRIMACK COUNTY REGISTRY OF DEEDS PLAN # 201500003883.

3. "PROPOSED PARKING LOT #4" PREPARED BY BRUNO ASSOCIATES, ENGINEERS, PLANNERS, SURVEYORS DATED NOVEMBER 3, 2003.

4. THE BEARINGS SHOWN HEREON REFER TO THE NEW HAMPSHIRE COORDINATE SYSTEM, GRID NORTH. THE VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

5. THIS PLAN IS BASED ON A FIELD SURVEY COMPLETED BY HORIZONS ENGINEERING, INC. IN MAY OF 2022 WITH SOKKIA GRX3 DUAL FREQUENCY SURVEY GRADE GPS RECEIVERS AND A LEICA TS12 ROBOTIC TOTAL STATION AND IN OCTOBER OF 2022 WITH CARLSON BRx7 DUAL FREQUENCY SURVEY GRADE GPS RECEIVERS AND A LEICA TS13 ROBOTIC TOTAL STATION.

6. THE WETLANDS WERE DELINEATED ON APRIL 18, 2022 AND OCTOBER 2022 BY CAITLIN BANASZAK, CERTIFIED WETLAND SCIENTIST, OF HORIZONS ENGINEERING, INC., ACCORDING TO THE DELINEATION STANDARDS IN THE REPORT "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION (VERSION 2.0-1/12) AND NH WETLANDS BUREAU RULE AND REGULATIONS. WETLAND FLAGS WERE LOCATED AT THE TIME OF THE FIELD SURVEY. SEE SHEET C1.01 FOR FULL WETLAND NOTES

7. ON-SITE SOILS WERE DELINEATED BY LUKE HURELY, CSS # 095, GOVE ENVIRONMENTAL SERVICES, INC. IN OCTOBER 2022. SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH; ISSUE # 10, JANUARY 2011. SHEET SHEET C1.01 FOR FULL SOIL NOTES.

8. OFF-SITE SOILS ARE COURTESY OF THE MERRIMACK AND GRAFTON COUNTY SOIL SURVEY, AND THE SULLIVAN COUNTY SOIL SURVEY. DATA OBTAINED FROM NRCS.

9. FEATURES SHOWN HEREON THE "OVERALL PLAN" OUTSIDE THE PROJECT SITE AREA ARE FROM THE STATE OF NEW HAMPSHIRE'S GIS DATABASES AND AERIAL ORTHO-IMAGERY.

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

PROJECT #: 22298
DATE: MAR 2023
MAP-LOT (OR ADDRESS): 13-386-92
SURVEYED BY: HEI
ENGINEERED BY: HEI
DRAWN BY: SJB
CHECKED BY: WTD

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MOUNT SUNAPEE RESORT
NEWBURY / NEW HAMPSHIRE
PARKING EXPANSION

OVERALL PLAN, PROJECT NOTES, AND LEGEND

SHEET C 1.00

DATE OF PRINT
MARCH 10 2023
HORIZONS ENGINEERING

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\\192.168.50.3\Projects_2022\22098 Mt Sunapee - Parking Lot 4\Planset\Design\DWGS\Final\220298_CUTSHEET-01.dwg, C1.00 Overall, 3/10/2023 2:18:18 PM, Chrisenack

WETLAND NOTES

STATE AND FEDERAL JURISDICTIONAL WETLANDS WERE DELINEATED BY N.H. CERTIFIED WETLAND SCIENTIST, CAITLIN BANASZAK CWS NO. 311 ON 18 APRIL 2022 AND 24 OCTOBER 2022. WETLANDS MAPPING WAS DONE BY N.H. LICENSED LAND SURVEYORS, HORIZONS ENGINEERING, INC. IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:

1. N.H. CODE OF ADMINISTRATIVE RULES (ENV-WT 301.01) WITH THE TECHNIQUES OUTLINED IN THE 1987 "U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1."
2. U.S. ARMY CORPS OF ENGINEERS. 2009. "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER, ENVIRONMENTAL LABORATORY ERDC/EL TR-09-19."
3. U.S. ARMY CORPS OF ENGINEERS. 2012. "NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST REGION, U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER, ENVIRONMENTAL LABORATORY.
4. N.H. CODE OF ADMINISTRATIVE RULES (ENV-WT 301.02) WITH THE U.S. FISH AND WILDLIFE SERVICE MANUAL FWS/OBS-79/31 ENTITLED "CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES, COWARDIN ET AL, 1979."
5. NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2004. 3RD ED., "FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND." NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
6. U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE. 2010. "FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0." L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.

WETLAND CLASSIFICATION

PFO1E	PALUSTRINE/FORESTED/BROAD-LEAVED-DECIDUOUS/SEASONALLY FLOODED
PFO1/4E	PALUSTRINE/FORESTED/BROAD-LEAVED DECIDUOUS/NEEDLE-LEAVED EVERGREEN/SEASONALLY FLOODED
PFO/SS1E	PALUSTRINE/FORESTED/SHRUB-SCRUB/BROAD-LEAVED DECIDUOUS/SEASONALLY FLOODED
PSS1E	PALUSTRINE/SCRUB-SHRUB/BROAD-LEAVED-DECIDUOUS/SEASONALLY FLOODED
R2UBH	RIVERINE/LOWER PERENNIAL/UNCONSOLIDATED BOTTOM/PERMANENTLY FLOODED
R4SB4/5	RIVERINE/INTERMITTENT/STREAM BED/SAND/MUD
R4SB5	RIVERINE/INTERMITTENT/STREAM BED/MUD

SOILS LEGEND

SYMBOL	NAME	HISS SYM	HYDROLOGIC SOIL GROUP	SOURCE
559	SKERRY, VERY STONY	323	C	SSSS
646/P	PILLSBURY, POORLY DRAINED	523	C	SSSS/NRCS
59	WAUMBEK, VERY STONY	321	B	SSSS
161	LYMAN-TUNBRIDGE COMPLEX	224/227	C/D	SSSS
299hghdd	UDORTHENTS, URBAN LAND	766	D	SSSS
380	TUNBRIDGE-LYMAN-BECKET COMPLEX	--	C	NRCS

559B — INDICATES SOIL TYPE

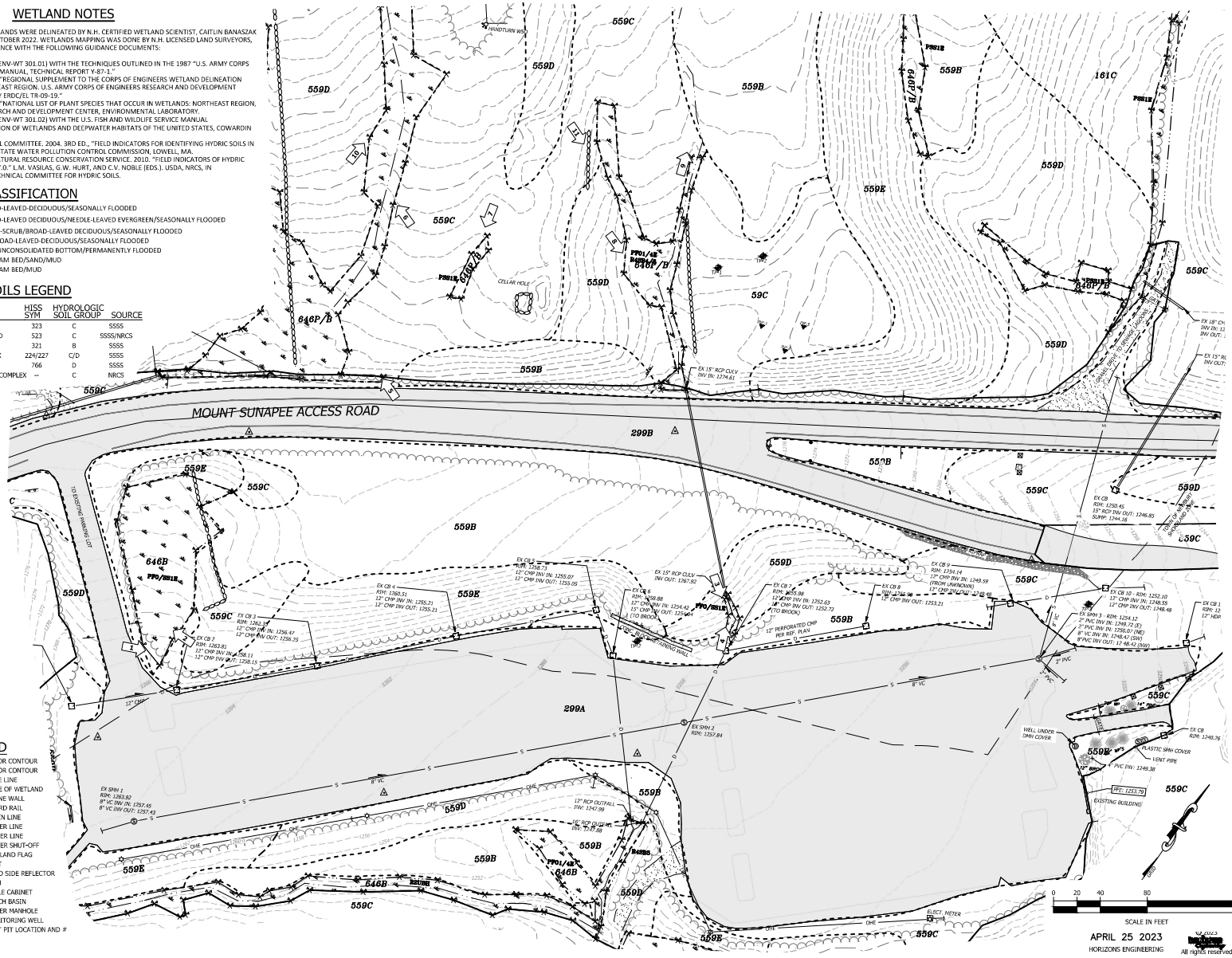
INDICATES SLOPE OF LAND
- B = 0 TO 8 PERCENT SLOPE
- C = 8 TO 15 PERCENT SLOPE
- D = 15 TO 25 PERCENT SLOPE
- E = GREATER THAN 25 PERCENT

SOIL NOTE:
THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.
THE SITE SPECIFIC SOIL SURVEY (SSSS) WAS PRODUCED ON OCTOBER 31, 2022, AND WAS PREPARED BY LUKE HURLEY, CSS # 095, GOVE ENVIRONMENTAL SERVICES, INC. SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE # 10, JANUARY 2011. THE NUMERIC LEGEND WAS AMENDED TO IDENTIFY THE CORRECT SOIL COMPONENTS OF THE COMPLEX.

LUKE D. HURLEY — No. 095 — 11/4/22

LEGEND

- MAJOR CONTOUR
- MINOR CONTOUR
- TREE LINE
- EDGE OF WETLAND
- STONE WALL
- GUARD RAIL
- D — DRAIN LINE
- S — SEWER LINE
- W — WATER LINE
- WATER SHUT-OFF
- WETLAND FLAG
- POST
- ROAD SIDE REFLECTOR
- SIGN
- CABLE CABINET
- CATCH BASIN
- SEWER MANHOLE
- MONITORING WELL
- TEST PIT LOCATION AND #


MOUNT SUNAPEE ACCESS ROAD
559B
559C
559D
559E
646P/B
646B
299B
299A
161C
PFO/SS1E
PFO1/4E
PSS1E
R4SB5
TO EXISTING PARKING LOT
EXISTING RETAINING WALL
EX 15" RCP CULV INV IN: 1274.61
EX 15" RCP CULV INV OUT: 1267.92
EX CB 1 RIM: 1260.51 12" CMP INV IN: 1255.21 12" CMP INV OUT: 1255.21
EX CB 2 RIM: 1263.81 12" CMP INV IN: 1258.11 12" CMP INV OUT: 1258.15
EX CB 3 RIM: 1262.34 12" CMP INV IN: 1256.47 12" CMP INV OUT: 1256.35
EX CB 4 RIM: 1258.88 12" CMP INV IN: 1254.42 12" CMP INV OUT: 1254.42 (TO BROOK)
EX CB 5 RIM: 1255.07 12" CMP INV IN: 1253.05 12" CMP INV OUT: 1253.05
EX CB 6 RIM: 1258.88 12" CMP INV IN: 1254.42 15" CMP INV OUT: 1254.42 (TO BROOK)
EX CB 7 RIM: 1255.98 12" CMP INV IN: 1252.63 12" CMP INV OUT: 1252.72 (TO BROOK)
EX CB 8 RIM: 1256.98 12" CMP INV OUT: 1253.21
EX CB 9 RIM: 1254.14 12" CMP INV IN: 1249.59 (FROM UNKNOWN) 12" CMP INV OUT: 1249.68
EX CB 10 - RIM: 1252.10 12" CMP INV IN: 1248.55 12" CMP INV OUT: 1248.48
EX SMH 3 - RIM: 1254.12 2" PVC INV IN: 1249.72 (E) 2" PVC INV IN: 1250.07 (NE) 8" VC INV IN: 1248.47 (SW) 8"PVC INV OUT: 12 48.42 (SW)
EX CB 1 RIM: 12 12" HDP
EX CB RIM: 1250.45 15" RCP INV OUT: 1246.85 SUMP: 1244.16
EX 18" CM INV IN: 12 INV OUT:
EX 15" RC INV OUT:
EX SMH 1 RIM: 1263.82 8" VC INV IN: 1257.45 8" VC INV OUT: 1257.43
EX SMH 2 RIM: 1257.84
12" RCP OUTFALL INV: 1247.99
12" RCP OUTFALL INV: 1247.88
EX CB RIM: 1240.76
PLASTIC SMH COVER
VENT PIPE
4" PVC INV: 1249.38
WELL UNDER DMH COVER
EXISTING BUILDING
FFE: 1253.70
ELECT. METER
GRAVEL DRIVE
CELLAR HOLE
HANDTURN WS
TP1
TP2
TP3
TP4
TP5
TP6
TP7
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TP40

WETLAND NOTES

STATE AND FEDERAL JURISDICTIONAL WETLANDS WERE DELINEATED BY N.H. CERTIFIED WETLAND SCIENTIST, CAITLIN BANASZAK CWS NO. 311 ON 18 APRIL 2022 AND 24 OCTOBER 2022. WETLANDS MAPPING WAS DONE BY N.H. LICENSED LAND SURVEYORS, HORIZONS ENGINEERING, INC. IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:

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- POST
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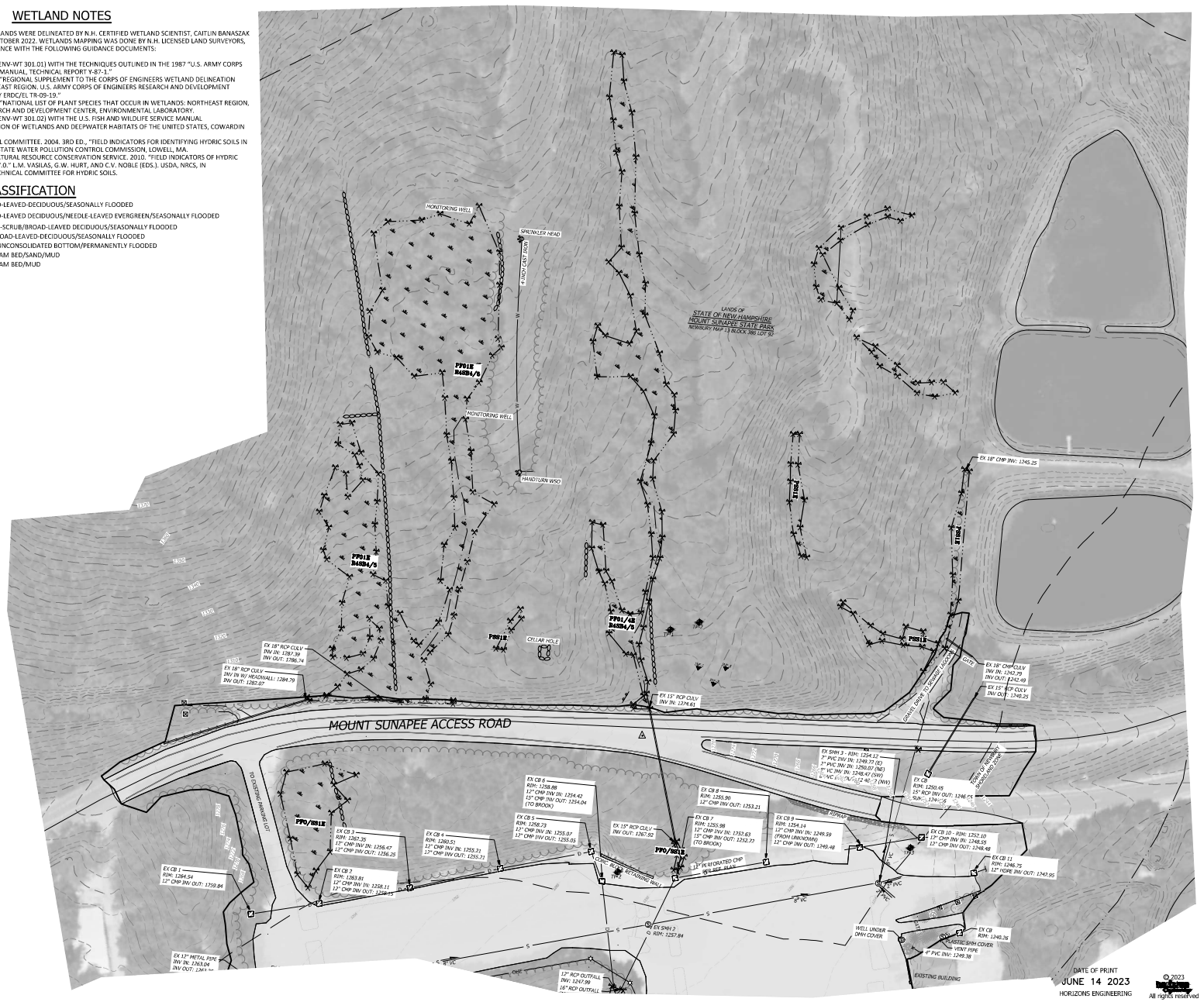
- SIGN
- CABLE CABINET
- CATCH BASIN
- SEWER MANHOLE
- MONITORING WELL
- TEST PIT LOCATION AND #



DATE OF PRINT
JUNE 14 2023
HORIZONS ENGINEERING

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NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	08/10/23	REVISIONS PER ACF RPHE, USPA & NCI COMMENTS	CJH	CJH

PROJECT #: 220298
DATE: MAR 2023
SURVEYED BY: --
ENGINEERED BY: CJH
DRAWN BY: CJH
CHECKED BY: --

CAITLIN BANASZAK CERTIFIED WETLAND SCIENTIST No. 311 STATE OF NEW HAMPSHIRE

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VAIL RESORTS

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NEWBURY, NEW HAMPSHIRE

EXISTING CONDITIONS PLAN
60-SCALE ADDITIONAL AREAS

SHEET C1.01A

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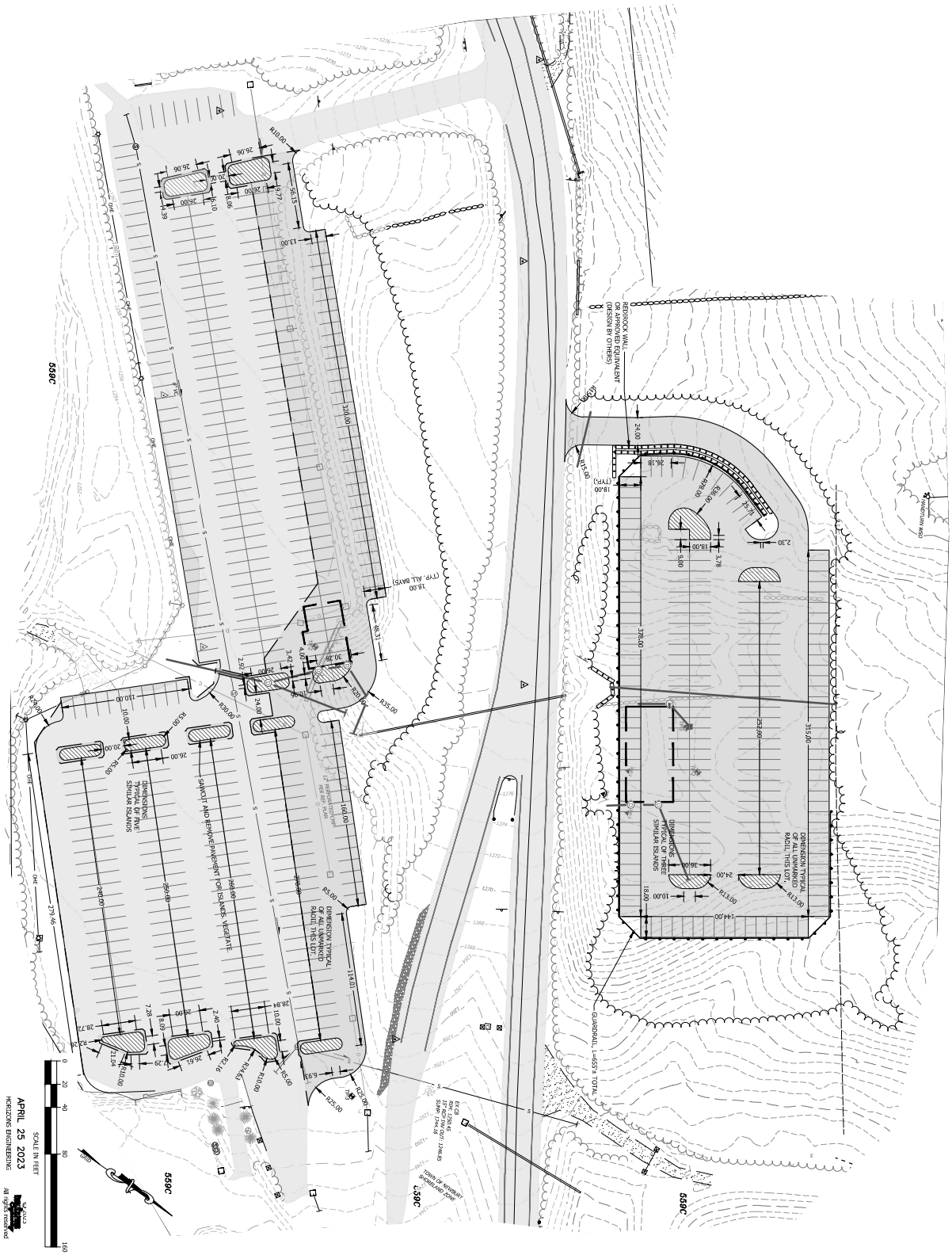
Z:\proj_2022\220298 Mt Sunapee - Parking Lot 4\Internal\Design\DWGS\Final\220298_FINAL-0-3-xot_fin.dwg, C2.01 LAYOUT, 4/25/2023 11:17:01 AM, Christernick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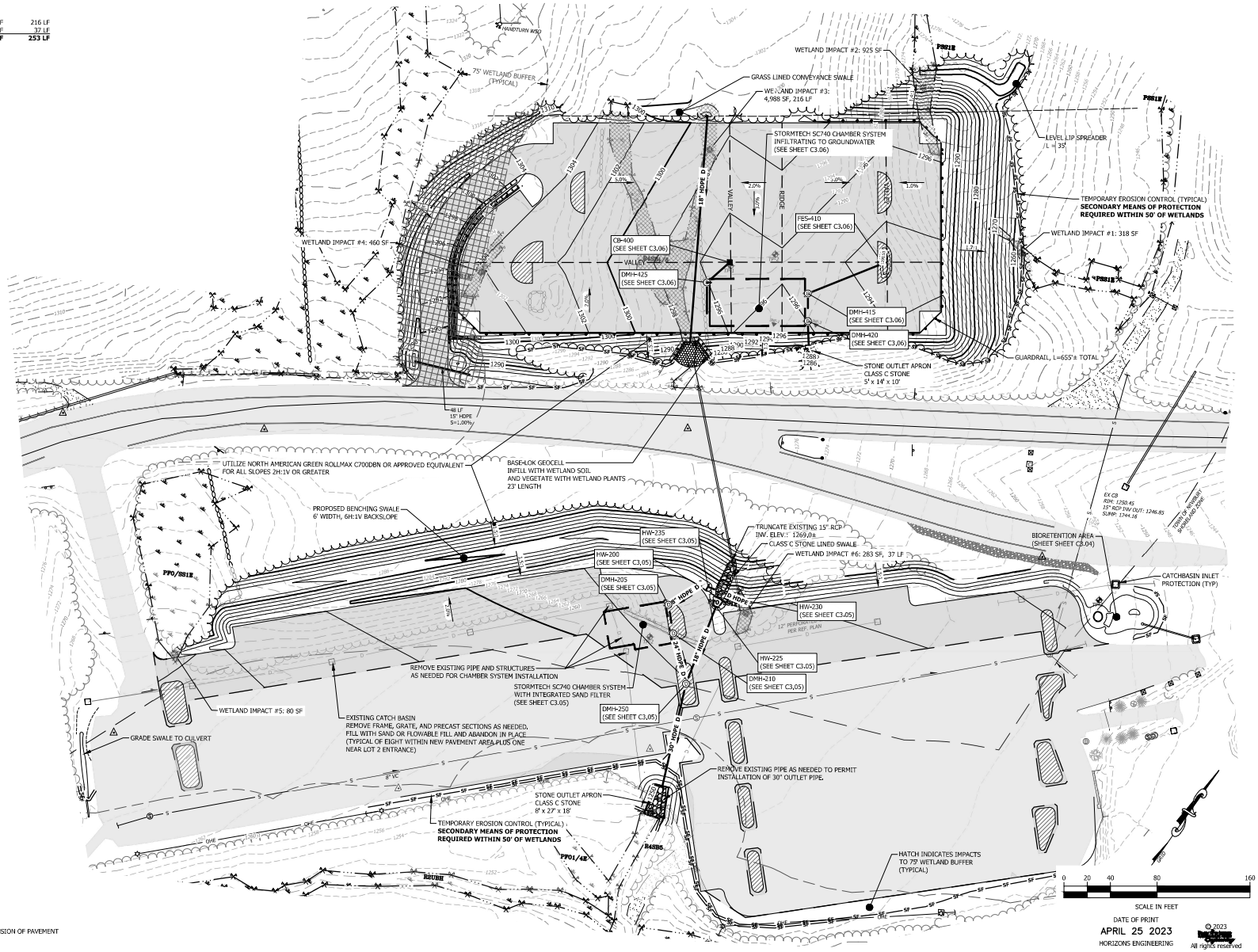
WETLAND IMPACT SUMMARY:		
PARKING LOT 4 CREATION	6,691 SF	216 LF
PARKING LOT 2 EXPANSION	363 SF	37 LF
OVERALL IMPACTS	**7,054 SF**	**253 LF**



LEGEND:

PROPOSED EXPANSION OF PAVEMENT

PARKING ISLAND

DATE OF PRINT
APRIL 25 2023
HORIZONS ENGINEERING

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NEW HAMPSHIRE – STATE OF – PROFESSIONAL ENGINEER
CHRISTOPHER M. HAMEL
No. 13308
CERTIFICATE NUMBER
Christopher M. Hamel

NO.	DATE	REVISION DESCRIPTION	ENG DWG

PROJECT #:	220298
DATE:	MAR 2023
SURVEYED BY:	--
ENGINEERED BY:	CJH
DRAWN BY:	CJH
CHECKED BY:	--

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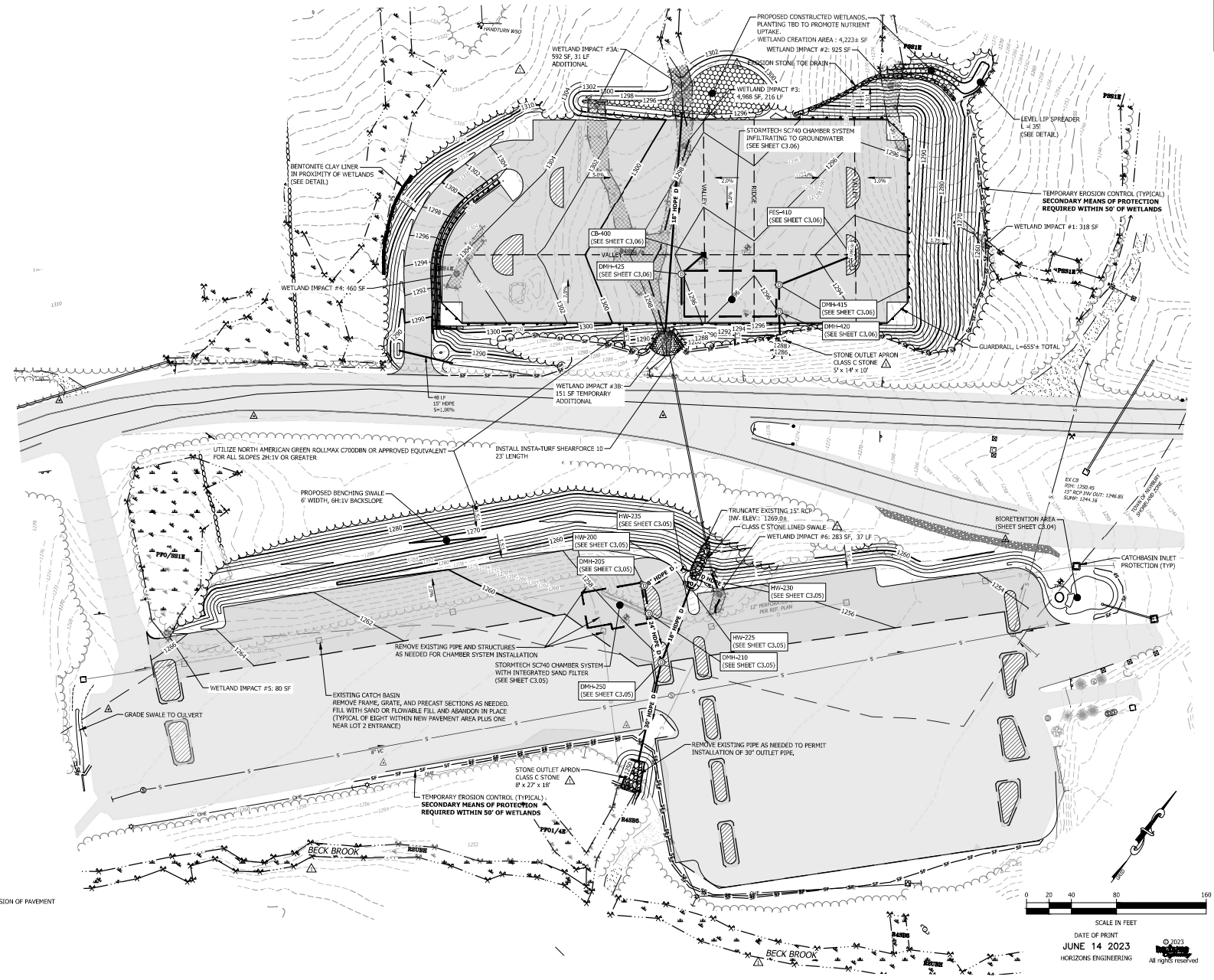
NEWBURY, NEW HAMPSHIRE

SITE GRADING AND DRAINAGE PLAN

SHEET C2.02

Z:\proj\2023\220298 Mt Sunapee - Parking Lot 4\planset\Design\DWGS\Final\220298_FINAL-01-Set2_4Pm.dwg, C2.01 GRADING, 4/25/2023 11:17:07 AM, Christopherk

CONCEPT PLAN



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1	08/10/23	REVISIONS PER AOT RPHE, USPA & NCC COMMENTS	CJH	CJH

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SITE GRADING AND DRAINAGE PLAN

SHEET C2.02

SEEDING RECOMMENDATIONS

1. GRADING AND SHAPING

A. SLOPES SHALL NOT BE STEEPER THAN 2:1; 3:1 SLOPES OR FLATTER ARE PREFERRED. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.

2. SEEDBED PREPARATION

A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.

B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE AMENDED WITH ORGANIC MATTER AND TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME THOROUGHLY INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

3. ESTABLISHING VEGETATION

A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:

-AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ. FT.
-NITROGEN (N), 50 LBS., PER ACRE OR 1.1 LBS PER 1,000 SQ. FT.
-PHOSPHATE (P_2O_5), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ. FT.
-POTASH (K_2O), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ. FT.

(NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10).

B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING, AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.

C. SEEDING GUIDE:

USE	SEEDING MIXTURE (SEE 3D)	SOIL TYPE: DROUGHTY	WELL DRAINED	MOD. WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILL-WAYS, AND OTHER CHANNELS WITH FLOWING WATER	A	GOOD	GOOD	GOOD	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR

D. SEEDING RATES:

MIXTURE		POUNDS PER ACRE	POUNDS PER 1,000 SQ. FT.
A	TALL FESCUE	20	0.45
	CREEPING RED FESCUE	20	0.45
	REDTOP	2	0.05
	TOTAL:	42	0.95
B	TALL FESCUE	15	0.35
	CREEPING RED FESCUE	10	0.25
	CROWN VETCH **OR**	15 **OR**	0.35 **OR**
	FLATPEA	30	0.75
	TOTAL:	40 **OR** 55	0.95 **OR** 1.35
C	TALL FESCUE	20	0.45
	FLATPEA	30	0.75
	TOTAL:	50	1.20

E. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO SEPTEMBER 15, WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.

F. TEMPORARY SEEDING RATES:

SPECIES	POUNDS PER ACRE	POUNDS PER 1,000 SQ. FT.	REMARKS
WINTER RYE	112	2.5	BEST FOR FALL SEEDING. SEED FROM AUGUST TO SEPTEMBER 5TH FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.
OATS	80	2.0	BEST FOR SPRING SEEDING. SEED NO LATER THAN MAY 15TH FOR SUMMER PROTECTION. SEED TO A DEPTH OF 1 INCH.
ANNUAL RYEGRASS	40	1.0	GROWS QUICKLY, BUT IS OF SHORT DURATION. USE WHERE APPEARANCES ARE NOT IMPORTANT. SEED EARLY SPRING AND/OR BETWEEN AUGUST 15TH AND SEPTEMBER 15TH. COVER SEED WITH NO MORE THAN 0.25 INCH OF SOIL.
PERENNIAL RYEGRASS	30	0.7	GOOD COVER WHICH IS LONGER LASTING THAN ANNUAL RYEGRASS. SEED BETWEEN APRIL 1ST AND JUNE 1ST AND/OR BETWEEN AUGUST 15TH AND SEPTEMBER 15TH. MULCHING WILL ALLOW SEEDING THROUGHOUT THE GROWING SEASON. SEED TO A DEPTH OF APPROXIMATELY 0.5 INCH.

4. MULCH

A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.

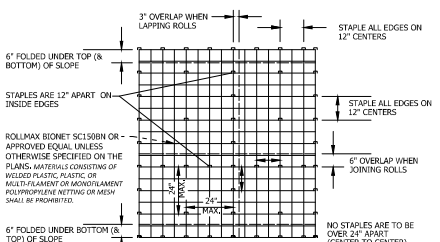
B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING.

5. MAINTENANCE TO ESTABLISH A STAND

A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.

B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ON SITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.

C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.



MULCH NETTING DETAIL

SOURCE: USDA SOIL CONSERVATION SERVICE
NO SCALE

EROSION CONTROL GENERAL NOTES

A. KEEP SITE MODIFICATION TO A MINIMUM

1. CONSIDER FITTING THE BUILDINGS AND STREETS TO THE NATURAL TOPOGRAPHY. THIS REDUCES THE NEED FOR CUTS AND FILLS. AVOID EXTENSIVE GRADING THAT WOULD ALTER DRAINAGE PATTERNS OR CREATE VERY STEEP SLOPES.
2. EXPOSE AREAS OF BARE SOIL TO EROSIVE ELEMENTS FOR THE SHORTEST TIME POSSIBLE.
3. SAVE AND PROTECT DESIRABLE EXISTING VEGETATION WHERE POSSIBLE. ERECT BARRIERS TO PREVENT DAMAGE FROM CONSTRUCTION EQUIPMENT.
4. LIMIT THE GRADES OF SLOPES SO VEGETATION CAN BE EASILY ESTABLISHED AND MAINTAINED.
5. AVOID SUBSTANTIAL INCREASE IN RUNOFF LEAVING THE SITE.

B. MINIMIZE POLLUTION OF WATER DURING CONSTRUCTION ACTIVITIES

1. STOCKPILE TOPSOIL REMOVED FROM CONSTRUCTION AREA AND SPREAD OVER ANY DISTURBED AREAS PRIOR TO REVEGETATION. TOPSOIL STOCKPILES MUST BE PROTECTED FROM EROSION.
2. PROTECT BARE SOIL AREAS EXPOSED BY GRADING ACTIVITIES WITH TEMPORARY VEGETATION OR MULCHES.
3. USE SEDIMENT BASINS TO TRAP DEBRIS AND SEDIMENT WHICH WILL PREVENT THESE MATERIALS FROM MOVING OFF SITE.
4. USE DIVERSIONS TO DIRECT WATER AROUND THE CONSTRUCTION AREA AND AWAY FROM EROSION PRONE AREAS TO POINTS OF SAFE DISPOSAL.
5. USE TEMPORARY CULVERTS OR BRIDGES WHEN CROSSING STREAMS WITH EQUIPMENT.
6. PLACE CONSTRUCTION FACILITIES, MATERIALS, AND EQUIPMENT STORAGE AND MAINTENANCE AREAS AWAY FROM DRAINAGE WAYS.

C. PROTECT AREA AFTER CONSTRUCTION.

1. ESTABLISH GRASS OR OTHER SUITABLE VEGETATION ON ALL DISTURBED AREAS. SELECT SPECIES ADAPTED TO THE SITE CONDITIONS AND THE FUTURE USE OF THE AREA. FINAL GRADES SHALL BE SEEDED WITHIN 72 HOURS. STABILIZATION SHALL BE DEFINED AS 85% VEGETATIVE COVER.
2. MAINTAIN VEGETATED AREAS USING PROPER VEGETATIVE 'BEST MANAGEMENT PRACTICES' DURING THE CONSTRUCTION PERIOD.
3. MAINTAIN NEEDED STRUCTURAL 'BEST MANAGEMENT PRACTICES' AND REMOVE SEDIMENT FROM DETENTION PONDS AND SEDIMENT BASINS AS NEEDED.
4. DETERMINE RESPONSIBILITY FOR LONG TERM MAINTENANCE OF PERMANENT 'BEST MANAGEMENT PRACTICES'.
5. IF CONSTRUCTION IS ANTICIPATED DURING WINTER MONTHS, REFER TO 'COLD WEATHER SITE STABILIZATION REQUIREMENTS'.

D. INVASIVE SPECIES AND FUGITIVE DUST

1. THE PROJECT SHALL NOT CONTRIBUTE TO THE SPREAD OF INVASIVE SPECIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EVALUATE WORK AREAS FOR THE PRESENCE OF INVASIVE SPECIES, AND IF FOUND SHALL TAKE NECESSARY MEASURES TO PREVENT THEIR SPREAD IN ACCORDANCE WITH RSA 430:51-57 AND AGR 3800. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT THE INTRODUCTION OF INVASIVE SPECIES BY INSPECTING AND CLEANING ALL EQUIPMENT ARRIVING ON SITE.
2. FUGITIVE DUST SHALL BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000.

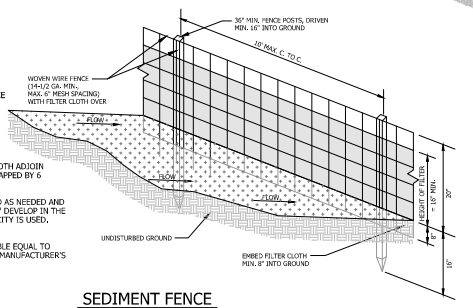
COLD WEATHER SITE STABILIZATION REQUIREMENTS

TO ADEQUATELY PROTECT WATER QUALITY DURING COLD WEATHER AND DURING SPRING RUNOFF, THE FOLLOWING ADDITIONAL STABILIZATION TECHNIQUES SHALL BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 1:

1. THE AREA OF EXPOSED, UNSTABILIZED SOIL SHALL BE LIMITED TO 1 ACRE AND SHALL BE PROTECTED AGAINST EROSION BY THE METHODS DESCRIBED IN THIS SECTION PRIOR TO ANY THAW OR SPRING MELT EVENT. THE ALLOWABLE AREA OF EXPOSED SOIL MAY BE INCREASED IF A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY NHDES.
2. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE, SECURED WITH ANCHORED NETTING OR TACKIFIER, OR 2 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H).
3. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH PROPERLY INSTALLED AND ANCHORED EROSION CONTROL MATTING OR WITH A MINIMUM 4 INCH THICKNESS OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H).
4. INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX, MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H), SHALL NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH.
5. INSTALLATION OF EROSION CONTROL MATTING SHALL NOT OCCUR OVER SNOW OF GREATER THAN ONE INCH IN DEPTH OR ON FROZEN GROUND.
6. ALL PROPOSED STABILIZATION IN ACCORDANCE WITH NOTES 2 OR 3 ABOVE, SHALL BE COMPLETED WITHIN 1 DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS.
7. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS, AS DETERMINED BY THE OWNER'S ENGINEERING CONSULTANT.
8. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION OF THE ROAD OR PARKING AREA HAS STOPPED FOR THE WINTER SEASON SHALL BE PROTECTED WITH A MINIMUM 3 INCH LAYER OF BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM NO. 304.1 OR 304.2.

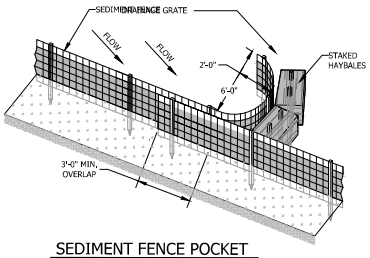
CONSTRUCTION NOTES FOR SEDIMENT FENCE

1. WOVEN WIRE FENCE, IF REQUIRED, TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP, MID SECTION, AND BOTTOM.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SEDIMENT FENCE, OR 50% OF CAPACITY IS USED.
5. 12" DIAMETER FILTREXX SILTSOXX SHALL BE CONSIDERED AN ACCEPTABLE EQUAL TO SEDIMENT FENCE IF INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.



SEDIMENT FENCE

NO SCALE



SEDIMENT FENCE POCKET

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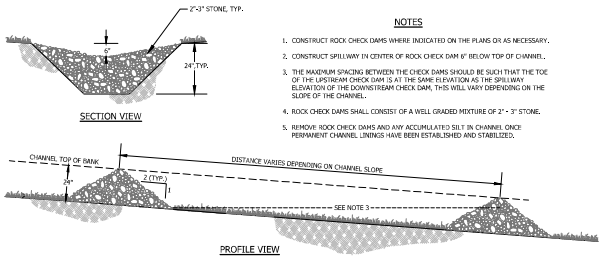


ROCK CHECK DAM DETAIL

NO SCALE

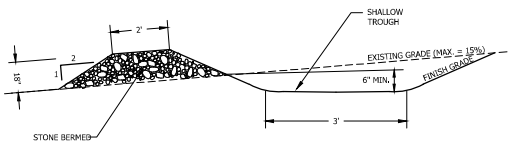
CONSTRUCTION SEQUENCE

1. PREPARE AN EROSION CONTROL PLAN OR A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
2. INSTALL CONSTRUCTION ENTRANCES. SEE DETAIL.
3. CUT AND CLEAR TREES WITHIN THE CLEARING LIMITS.
4. INSTALL SEDIMENT FENCES, ROCK CHECK DAMS, AND OTHER APPROPRIATE EROSION CONTROL MEASURES AT LOCATIONS SHOWN ON THE PLANS AND AS NEEDED. PERIMETER CONTROLS MUST BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
5. GRUB SITE WITHIN GRADING LIMITS.
6. STRIP AND STOCKPILE TOPSOIL AND INSTALL EROSION CONTROL MEASURES.
7. INSTALL/ADJUST SEDIMENT FENCE, CHECK DAMS, AND HAYBALES, AS REQUIRED.
8. CONSTRUCT PERMANENT STORMWATER CONTROLS AS SOON AS PRACTICAL. STORMWATER PONDS, INFILTRATION BASINS AND SWALES MUST BE INSTALLED BEFORE ROUGH GRADING THE SITE.
   DO NOT DIRECT STORMWATER TOWARD TREATMENT PRACTICES, DITCHES AND LEVEL SPREADERS UNTIL THEY HAVE BEEN STABILIZED, RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMPS ARE STABILIZED.
9. PROCEED WITH WORK, LIMITING THE DURATION OF DISTURBANCE. THE MAXIMUM OF UNCOVERED DISTURBED EARTH AT ANY ONE TIME IS FIVE ACRES. THE MAXIMUM LENGTH OF TIME THAT DISTURBED EARTH MAY BE LEFT UNSTABILIZED IS 45 DAYS.
10. BEGIN SEEDING AND MULCHING IMMEDIATELY AFTER GRADING. ALL DISTURBED AREAS SHALL BE STABILIZED WITH APPROVED METHODS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

    AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
    B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
    C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
    D) EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
11. INSPECT ALL EROSION CONTROL MEASURES ON A DAILY BASIS AND AFTER EVERY 0.5 INCHES OF PRECIPITATION. MAINTAIN SEDIMENT FENCE, SEDIMENT TRAPS, HAY BALES, ETC., AS NECESSARY.
12. PAVE ROADWAYS AND/OR PARKING AREAS.
13. PLACE TOPSOIL, SEED AND MULCH.
14. COMPLETE ALL REMAINING PERMANENT EROSION CONTROL STRUCTURES.
15. MONITOR THE SITE AND MAINTAIN STRUCTURES AS NEEDED UNTIL FULL VEGETATION IS ESTABLISHED
16. RE-FUELING OF EQUIPMENT SHALL NOT OCCUR WITHIN JURISDICTIONAL WETLANDS
17. FUEL STORAGE SHALL NOT BE WITHIN 25 FEET OF JURISDICTIONAL WETLANDS

LEVEL LIP SPREADER INSTALLATION

1. CONSTRUCT THE LEVEL SPREADER LIP ON A ZERO PERCENT GRADE TO INSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL NOR ON EXISTING GRADES IN EXCESS OF 15%.
3. STONE BERMED LEVEL SPREADERS SHALL NOT BE INSTALLED IN WETLANDS SOILS OR IN HYDROLIC SOILS GROUP D.
4. THE ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING A 3 FOOT WIDE BY 6" DEEP TRAPEZOIDAL TROUGH AND A 2 FOOT WIDE BY 18" HIGH STONE BERM FOR THE LENGTH OF THE IMPERVIOUS AREA OR FOR A MINIMUM OF 10 FEET.
5. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER SHOULD NOT RE-CONCENTRATE IMMEDIATELY BELOW THE SPREADER.
6. INSPECT ANNUALLY FOR ACCUMULATION OF SEDIMENT AND DEBRIS AND FOR SIGNS OF EROSION WITHIN APPROACH CHANNEL, SPREADER CHANNEL, OR DOWN SLOPE OF THE SPREADER.
7. REMOVE DEBRIS OBSERVED DURING INSPECTION.
8. REMOVE SEDIMENT WHEN ACCUMULATION EXCEEDS 25% OF SPREADER DEPTH.
9. MOW ANNUALLY TO CONTROL WOODY VEGETATION WITHIN THE SPREADER.
10. SNOW SHOULD NOT BE STORED WITHIN OR DOWNSLOPE OF THE LEVEL SPREADER OR IT'S APPROACH CHANNEL.
11. REPAIR EROSION AND REPLACE STONE BERM MATERIAL, AS WARRANTED BY INSPECTION.
12. RECONSTRUCT THE SPREADER IF DOWN-SLOPE CHANELLIZATION INDICATES THAT THE SPREADER IS NOT LEVEL OR THAT DISCHARGE HAS BECOME CONCENTRATED, AND CORRECTIONS CANNOT BE MADE THROUGH MINOR RE-GRADING.



LEVEL SPREADER DETAIL

NO SCALE
SOURCE: NH STORMWATER MANUAL: VOLUME 2

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HORIZONS ENGINEERING

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NEW HAMPSHIRE – STATE OF – CHRISTOPHER M. KEARNS – 13390 – LICENSED PROFESSIONAL ENGINEER

DATE	REVISION DESCRIPTION	ENG DWG

PROJECT #: 220298
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SURVEYED BY: --
ENGINEERED BY: CJH
DRAWN BY: CJH
CHECKED BY: --

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VAIL RESORTS
MOUNT SUNAPEE RESORT
PARKING EXPANSION
NEWBURY, NEW HAMPSHIRE
EROSION CONTROL NOTES AND DETAILS

SHEET C3.01

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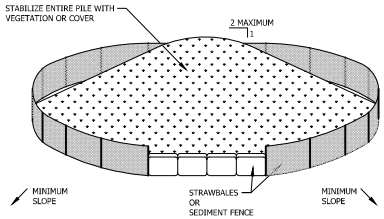
last modified: 2018-APR-18



SOIL STOCKPILING IS TO BE USED WHERE TOPSOIL IS NECESSARY FOR REGRADING AND VEGETATING DISTURBED AREAS.

TEMPORARY STOCKPILE STABILIZATION MEASURES INCLUDE VEGETATIVE COVERS, MULCH, NON-VEGETATIVE COVERS, AND PERIPHERAL SEDIMENT TRAPPING BARRIERS. THE STABILIZATION MEASURE(S) SELECTED SHOULD BE APPROPRIATE FOR THE TIME OF YEAR, SITE CONDITIONS, AND REQUIRED PERIOD OF USE.

INSTALLATION NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2:1.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAWBALES AND THEN STABILIZED WITH VEGETATION OR COVERED.

SOIL STOCKPILING DETAIL

NOT TO SCALE

SEDIMENT RETENTION WATTLES

DESCRIPTION
EROSION CONTROL AND SEDIMENT RETENTION WATTLES (ESW) OR SLOPE INTERRUPTION DEVICES (SID) COMMONLY KNOWN AS WATTLES, ARE ELONGATED TUBES OF COMPACTED STRAW THAT ARE INSTALLED ALONG CONTOURS OR AT THE BASE OF SLOPES TO HELP REDUCE SOIL EROSION AND RETAIN SEDIMENT. THEY FUNCTION BY SHORTENING SLOPE LENGTH, REDUCING RUNOFF WATER VELOCITY, TRAPPING DISLODGED SOIL PARTICLES AND AMELIORATING THE EFFECTS OF SLOPE STEEPNESS.

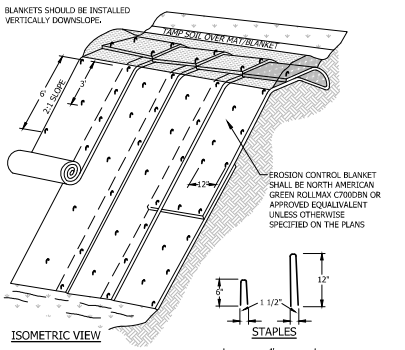
WATTLES ARE USED AS WATER FLOW DISSIPATERS TRAPPING SEDIMENT WHEN LOCATED PRIOR TO DRAIN INLETS, ETC. WATTLES ARE HIGHLY EFFECTIVE WHEN THEY ARE USED IN COMBINATION WITH OTHER SURFACE SOIL EROSION/RE-VEGETATION PRACTICES SUCH AS SURFACE ROUGHENING, STRAW MULCHING, EROSION CONTROL BLANKETS, HYDRAULIC MULCHING AND APPLICATION OF BONDED FIBER MATRIX OR OTHER HYDRAULIC SOIL STABILIZERS.

PROPERTIES:
MATERIAL: 100% WEED FREE STRAW
LONGEVITY: 24 MONTHS
NETTING: PHOTODEGRADABLE

DIAMETER	LENGTH	WEIGHT
9"	8' TO 25'	1.6 LBS/FT
12"	8' TO 20'	2.8 LBS/FT
18"	8' TO 20'	3.2 LBS/FT
20"	8' TO 20'	3.5 LBS/FT

NOTE: WATTLE SIZES, LENGTHS, WEIGHTS, AND LONGEVITY ARE APPROXIMATE.

INFORMATION PROVIDED BY:
ULTRATECH INTERNATIONAL, INC.
11542 DAVIS CREEK COURT, JACKSONVILLE, FL 32256 USA
PHONE: 800.353.1611 FAX: 904.292.1325 WWW.STORMWATER-PRODUCTS.COM

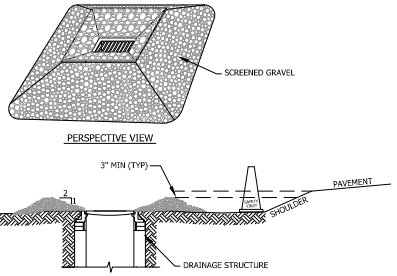


NOTES:
1. DIMENSION GIVEN IN THE DRAWINGS ARE EXAMPLES; DEVICE SHOULD BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
2. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS, MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
3. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
4. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
5. NOTE: PLASTIC FILAMENT PROHIBITED

DETAIL DIGITIZED FROM NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, NHDES 2008

EROSION CONTROL BLANKET INSTALLATION DETAIL

NOT TO SCALE

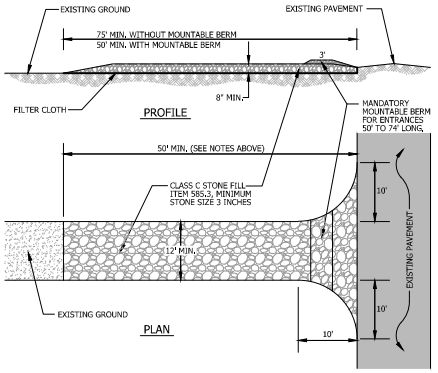


MATERIALS SPECIFICATIONS:
1. SCREENED GRAVEL: UNIFORMLY GRADED 1" TO 4" DIA. STONE.

CONSTRUCTION SPECIFICATIONS:
1. INSTALL GRAVEL INLET PROTECTION WHERE INDICATED OR WARRANTED.
2. FOR ALL INSTALLATIONS WHERE INLET PROTECTION IS WITHIN 8' OF EDGE OF PAVEMENT, A ROADWAY CONE SHALL BE USED BETWEEN CATCH BASIN AND SHOULDER.
3. ENSURE CREST OF GRAVEL PLACED AROUND CATCH BASIN IS AT LEAST 3" BELOW ELEVATION OF EDGE OF PAVEMENT.

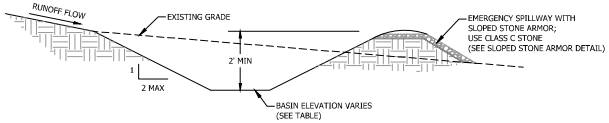
CATCH BASIN INLET PROTECTION DETAIL

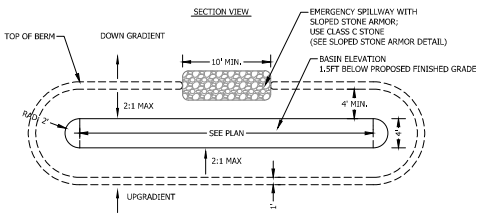
NO SCALE



STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE





TYPICAL TEMPORARY SEDIMENTATION TRAP DETAIL

NOT TO SCALE

TEMPORARY SEDIMENT TRAPS NOTES:
1. TEMPORARY SEDIMENT TRAPS SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TEMPORARY SEDIMENT TRAPS SHALL BE LESS THAN 5 ACRES.
3. TEMPORARY SEDIMENT TRAPS MUST BE CONSTRUCTED PRIOR TO EARTH MOVING AND/OR GRUBBING OPERATIONS. SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER AND SHALL BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
4. THE MINIMUM VOLUME OF THE BASIN SHOULD BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF CONTRIBUTING DRAINAGE AREA. TEMPORARY BASIN LOCATIONS AND SIZING MAY BE MODIFIED DURING CONSTRUCTION IF SIZING CRITERIA IS MET.
5. THE OUTLET OF THE TRAP SHALL BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
6. SEDIMENT SHOULD BE REMOVED AND THE BASIN RESTORED TO ORIGINAL CAPACITY WHEN SEDIMENT HAS ACCUMULATED TO 50% OF THE ORIGINAL VOLUME. THE MATERIALS REMOVED SHALL BE PROPERLY DISPOSED OF AND STABILIZED.
7. UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREAS, TEMPORARY SEDIMENTATION BASINS MAY BE REMOVED AND DISTURBED AREA RESTORING USING LOAM, SEED, AND EROSION MAT.

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EROSION CONTROL NOTES AND DETAILS

SHEET C3.02

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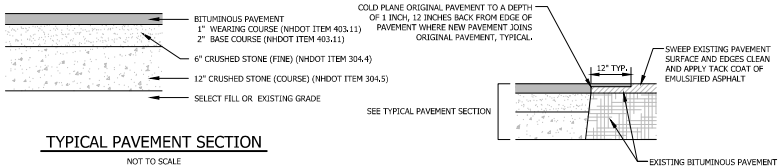
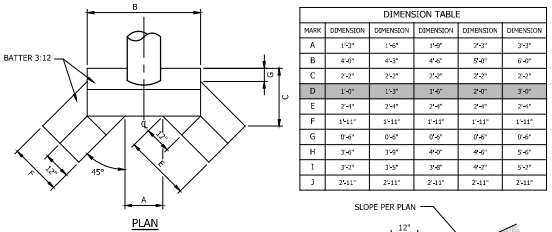


TYPICAL PAVEMENT SECTION

NOT TO SCALE

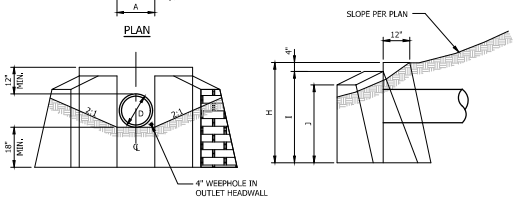
PAVEMENT JOINING DETAIL

NOT TO SCALE



DIMENSION TABLE					
MARK	DIMENSION	DIMENSION	DIMENSION	DIMENSION	DIMENSION
A	1'-3"	1'-6"	1'-9"	2'-3"	3'-3"
B	4'-0"	4'-3"	4'-6"	5'-0"	6'-0"
C	2'-2"	2'-3"	2'-3"	2'-2"	2'-2"
D	1'-0"	1'-3"	1'-6"	2'-0"	3'-0"
E	2'-1"	2'-1"	2'-1"	2'-1"	2'-1"
F	1'-11"	1'-11"	1'-11"	1'-11"	1'-11"
G	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"
H	3'-6"	3'-9"	4'-0"	4'-6"	5'-6"
I	3'-2"	3'-5"	3'-8"	4'-2"	5'-2"
J	2'-11"	2'-11"	2'-11"	2'-11"	2'-11"

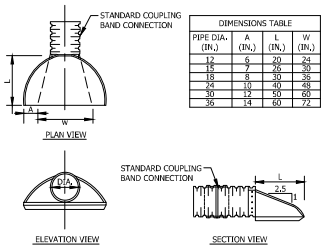
PLAN



END ELEVATION

SIDE ELEVATION

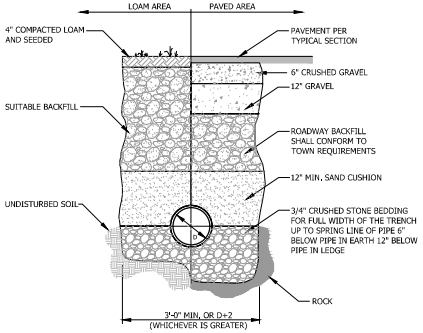
STONE MASONRY HEADWALL DETAILS



DIMENSIONS TABLE			
PIPE DIA. (IN.)	A (IN.)	L (IN.)	W (IN.)
12	6	20	24
15	7	25	30
18	8	30	36
24	10	40	48
30	12	50	60
36	14	60	72

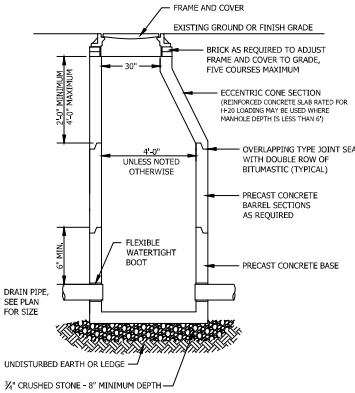
FLARED END SECTION DETAIL

NO SCALE



TYPICAL DRAINAGE TRENCH DETAIL

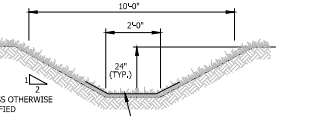
NOT TO SCALE



NOTE:
CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO CONFIRM ADEQUATE DIAMETER AND INVERTS.

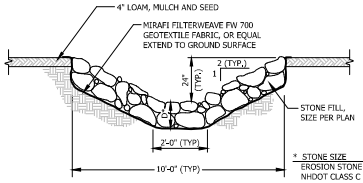
DRAIN MANHOLE DETAIL

NOT TO SCALE



GRASS LINED DITCH DETAIL

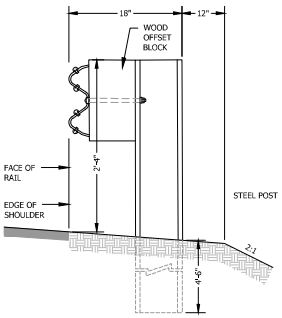
NOT TO SCALE



* STONE SIZE	MIN. D
EROSION STONE	12"
NHDOT CLASS C	12"
NHDOT CLASS B	18"
NHDOT CLASS A	30"

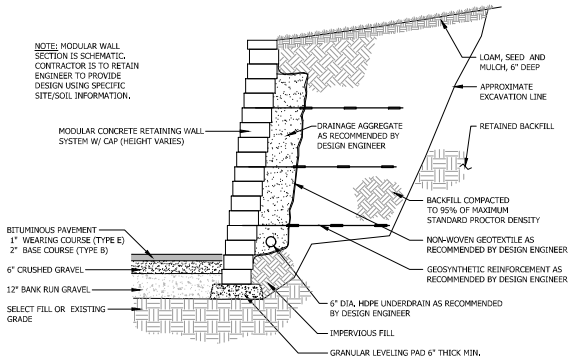
STONE LINED DITCH DETAIL

NOT TO SCALE



BEAM GUARDRAIL / STEEL POSTS

PER NHDOT SPECIFICATIONS
ITEM NO. 606.120



MODULAR RETAINING WALL DETAIL

NO SCALE

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CHECKED BY:	--

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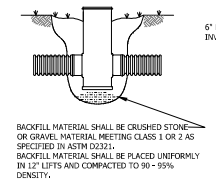
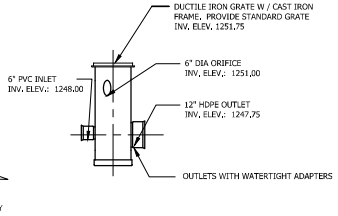
EROSION CONTROL NOTES AND DETAILS

SHEET C3.03

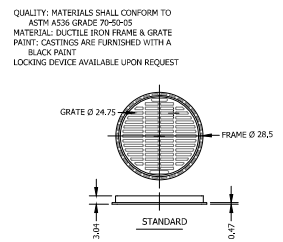
Z:\proj\2023\220298 Mt Sunapee - Parking Lot v3\internal\Design\DWG\Plan\[220298_Plan1-03-setC_4fin.dwg, C3.03 Misc Details, 4/25/2023 11:17:14 AM, Charlesmick



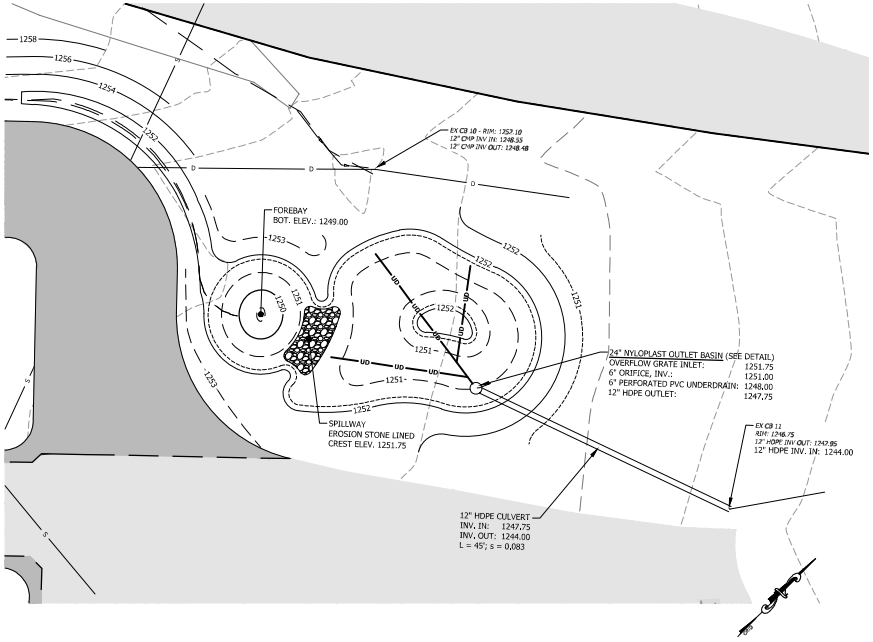
NYLOPLAST TRENCH DETAILS



NYLOPLAST 24" DRAIN BASIN



NYLOPLAST 24" STANDARD GRATE



STORMWATER TREATMENT AREA PLAN

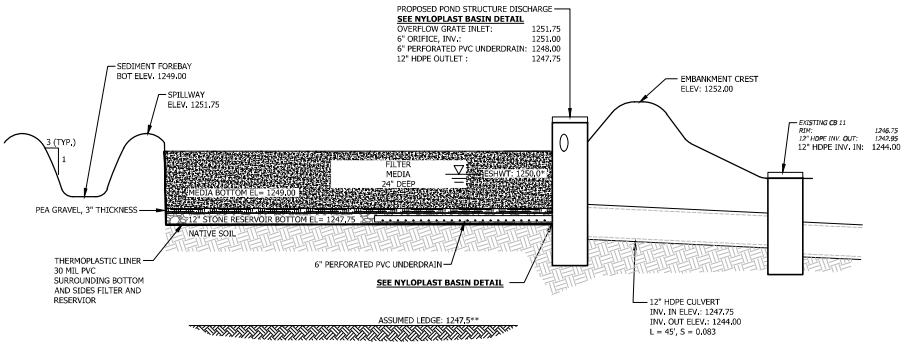
SCALE: 1" = 10'

BIORETENTION SYSTEM NOTES:

1. DO NOT PLACE THE BIORETENTION SYSTEM INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE FILTRATION COMPONENTS OF THE SYSTEM.

TABLE 4.3.2 - BIORETENTION FILTER MEDIA

COMPONENT MATERIAL	PERCENT OF MIXURE BY VOLUME	GRADATION OF MATERIAL	
		SIEVE NUMBER	PERCENT BY WEIGHT PASSING STANDARD SIEVE
Filter Media Option A			
ASTM C-33 CONCRETE SAND	50-55		
LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20-30	200	15-25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20-30	200	< 5
Filter Media Option B			
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20-30	200	< 5
LOAMY COARSE SAND	70-80	10	85-100
		20	70-100
		60	15-40
		200	8-5



* ESHWT WAS DETERMINED FOR THE PROPOSED BIORETENTION AREA USING THE DEPTH TO ESHWT OF 30" AT TEST PIT #3. THE EXISTING GRADE AT THE BIORETENTION AREA IS APPROXIMATELY 1252.5. THEREFORE ESHWT FOR THE FEATURE IS 1250.0. LINER IS PROPOSED TO SEPARATE FROM WATERTABLE, AND UNDERDRAINING IS ASSUMED TO DRAIN FEATURE

** NO LEDGE TO DEPTH WAS ENCOUNTERED AT TEST PIT #3. THE PIT TERMINATED AT 60", AND THE EXISTING GRADE IS APPROXIMATELY 1252.5. THEREFORE LEDGE IS ASSUMED AT 1247.50

BIORETENTION AREA

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DRAWN BY: CJH
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PARKING LOT 2
BIORETENTION AREA DETAILS

SHEET C3.04

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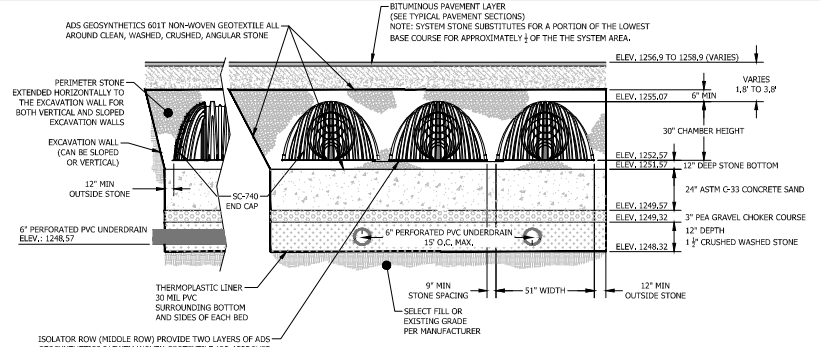
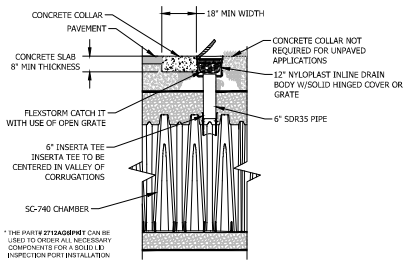


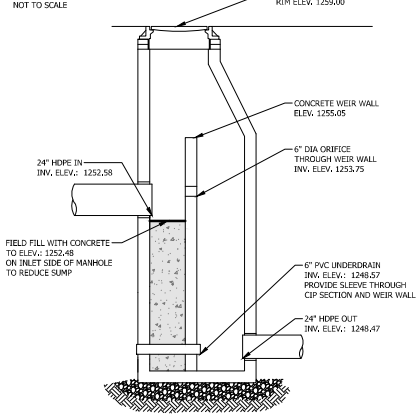
STORMTECH SC-740 CHAMBER SECTION

NOT TO SCALE



STORMTECH SC-740 6" INSPECTION PORT

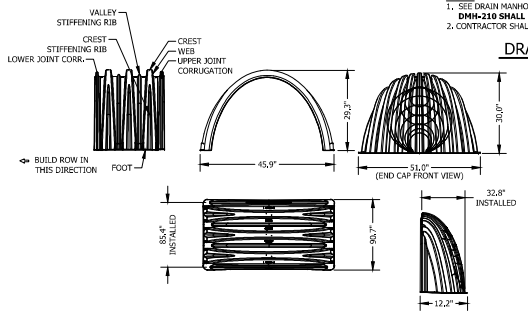
NOT TO SCALE



NOTES:
1. SEE DRAIN MANHOLE DETAIL, SHEET C3.03, FOR STANDARD DMH CONSTRUCTION REQUIREMENTS. **DMH-210 SHALL BE A 5FT INNER DIAMETER STRUCTURE.**
2. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO VERIFY DIAMETER, INVERTS, AND WEIR.

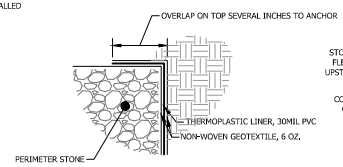
DRAIN MANHOLE DMH-210 DETAIL

NOT TO SCALE



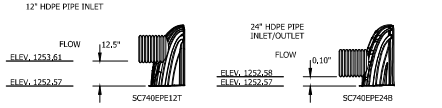
STORMTECH SC-740 CHAMBER DIMENSION

NOT TO SCALE



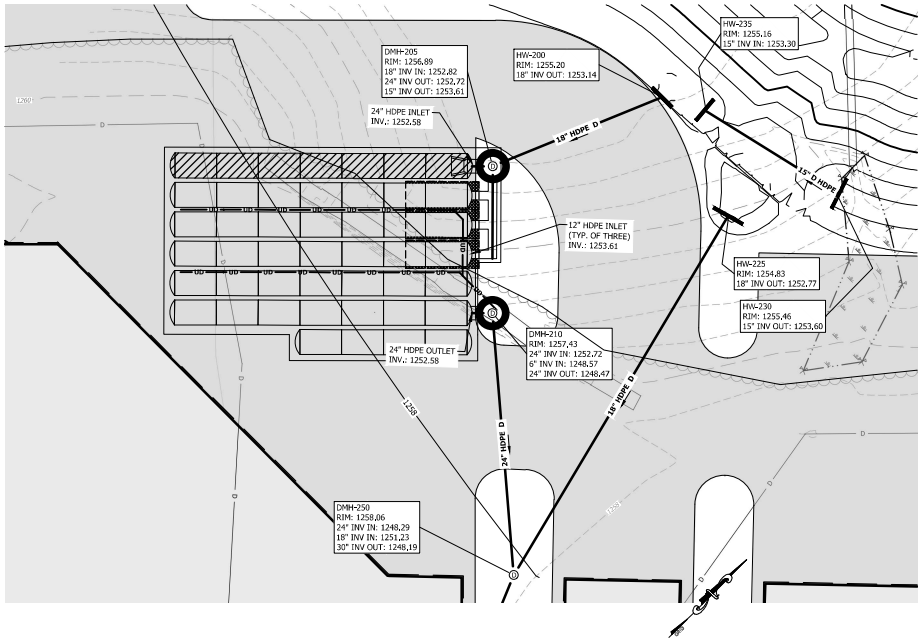
THERMOPLASTIC LINER DETAIL

NOT TO SCALE



STORMTECH SC-740 CHAMBER INLET SECTION

NOT TO SCALE



STORMWATER TREATMENT AREA PLAN

SCALE: 1" = 10'

IMPORTANT NOTES

FOUNDATION AND EMBEDMENT STONE SHALL BE **CLEAN, WASHED, ANGULAR CRUSHED STONE.** ENGINEER SHALL INSPECT AND VERIFY MATERIAL PRIOR TO SYSTEM INSTALLATION.

THIS SYSTEM IS NOT DESIGNED TO EXFILTRATE TO SOIL. 30 MIL PVC LINER IS REQUIRED

STORMTECH SC-740 CHAMBER SPECIFICATIONS

51.0" WIDE + 9.0" SPACING = 60.0" C-C ROW SPACING

46 CHAMBERS, 16 END CAPS
LONGEST ROW:
[7 CHAMBERS/ROW x 7.12' LONG] + [0.81' CAP LENGTH x 2] = 51.46' ROW LENGTH
+ [12.0" END STONE x 2] = 53.46' BASE LENGTH

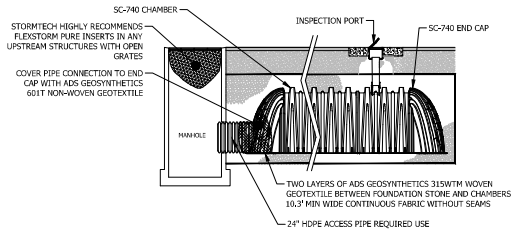
WIDEST WIDTH
[7 ROWS x 51.0" WIDE] + [9.0" SPACING X 6] + [12.0" SIDE STONE X 2] = 36.25' BASE WIDTH

[12.0" BASE + 30.0" CHAMBER HEIGHT + 6.0" COVER] = 4.00' FIELD HEIGHT

[46 CHAMBERS X 45.9 CF] = 2,111.4 CF CHAMBER STORAGE

7,369.6 CF FIELD - 2,111.4 CF CHAMBERS = 5,258.2 CF STONE X 40.0% VOIDS = 2,103.3 CF STONE STORAGE

OVERALL
CHAMBER STORAGE + STONE STORAGE = 4,214.7 CF = 0.097 AF
OVERALL STORAGE EFFICIENCY = 57.2%



STORMTECH SC-740 ISOLATOR ROW DETAIL

NOT TO SCALE

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NEWBURY, NEW HAMPSHIRE
PARKING LOT 2
CHAMBER SYSTEM DETAILS

SHEET C3.05

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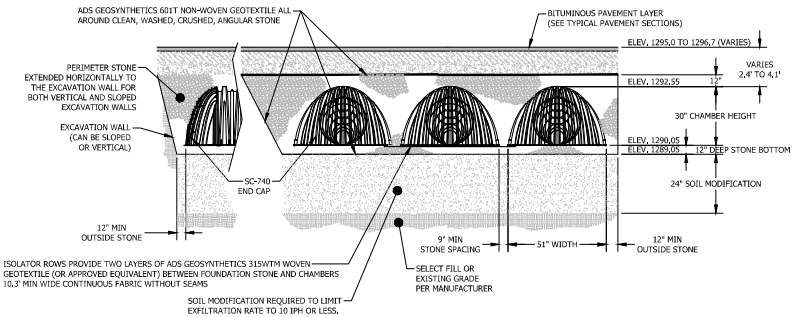
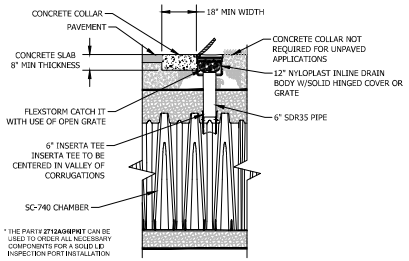


STORMTECH SC-740 CHAMBER SECTION

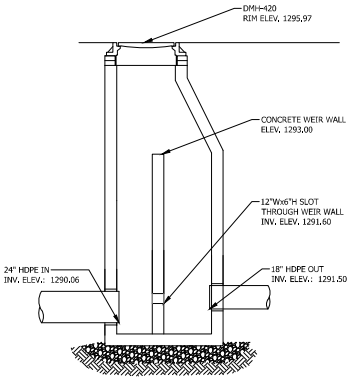
NOT TO SCALE

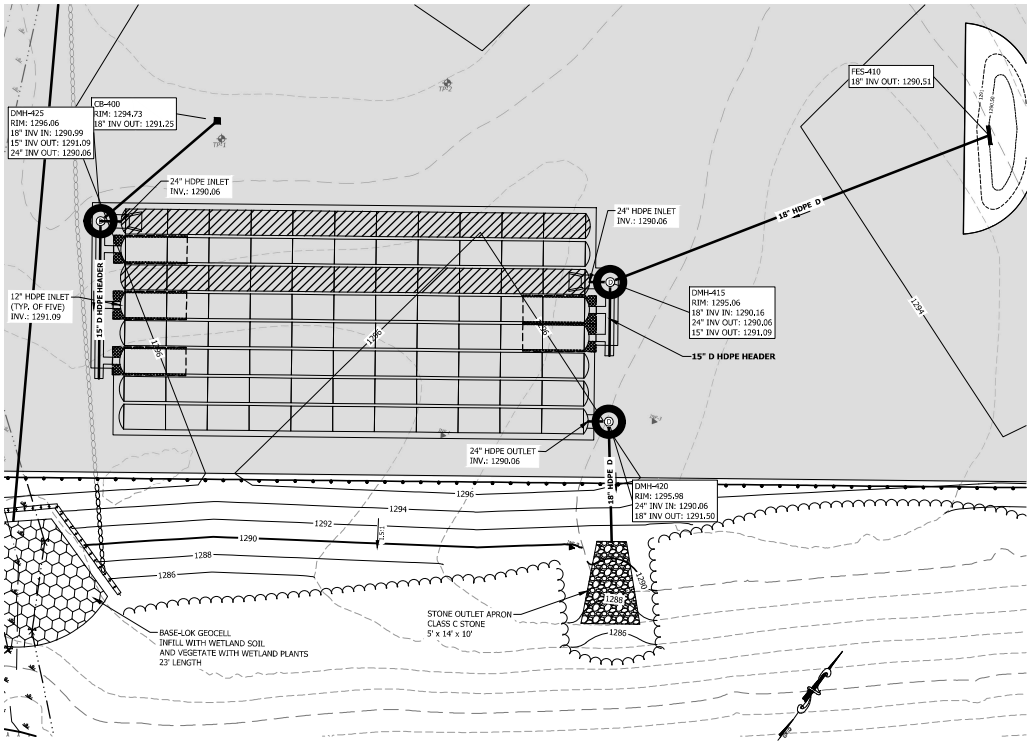


NOTE: PROVIDE TWO INSPECTION PORTS FOR EACH ISOLATOR ROW AT APPROXIMATELY 1/3 AND 2/3 OF THE ROW LENGTH

STORMTECH SC-740 6" INSPECTION PORT

NOT TO SCALE





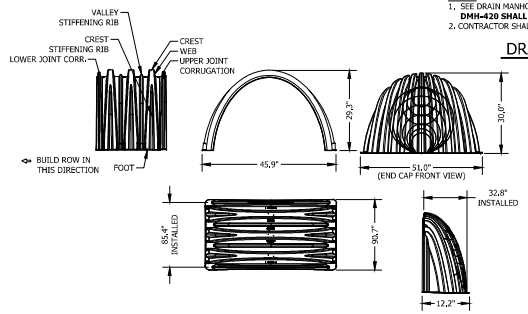
STORMWATER TREATMENT AREA PLAN

SCALE: 1" = 10'

NOTES:
1. SEE DRAIN MANHOLE DETAIL, SHEET C3.03, FOR STANDARD DMH CONSTRUCTION REQUIREMENTS.
   DMH-420 SHALL BE A 5FT INNER DIAMETER STRUCTURE.
2. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO VERIFY DIAMETER, INVERTS, AND WEIR.

DRAIN MANHOLE DMH-420 DETAIL

NOT TO SCALE



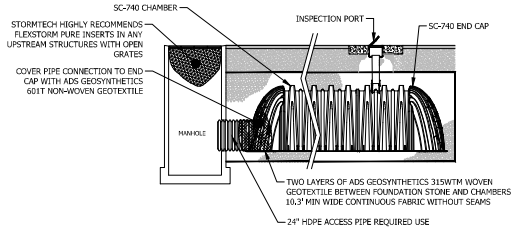
STORMTECH SC-740 CHAMBER DIMENSION

NOT TO SCALE



STORMTECH SC-740 CHAMBER INLET SECTION

NOT TO SCALE



STORMTECH SC-740 ISOLATOR ROW DETAIL

NOT TO SCALE

IMPORTANT NOTES

FOUNDATION AND EMBEDMENT STONE SHALL BE **CLEAN, WASHED, ANGULAR CRUSHED STONE.** ENGINEER SHALL INSPECT AND VERIFY MATERIAL PRIOR TO SYSTEM INSTALLATION.

THIS SYSTEM IS DESIGNED TO EXFILTRATE TO SOIL. PVC LINER IS PROHIBITED.

DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE INFILTRATION SYSTEM.

DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.

AFTER THE AREA IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.

DO NOT PLACE INFILTRATION SYSTEMS INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

STORMTECH SC-740 CHAMBER SPECIFICATIONS

51.0" WIDE + 9.0" SPACING = 60.0" C-C ROW SPACING

88 CHAMBERS, 16 END CAPS
[11 CHAMBERS/ROW x 7.12' LONG] + [0.81' CAP LENGTH x 2] = 79.94' ROW LENGTH
+ [12.0" END STONE x 2] = 81.94' BASE LENGTH

[8 ROWS x 51.0" WIDE] + [9.0" SPACING X 2] + [12.0" SIDE STONE X 2] = 41.25' BASE WIDTH

[12.0" BASE + 30.0" CHAMBER HEIGHT + 12.0" COVER] = 4.50' FIELD HEIGHT

[88 CHAMBERS X 45.9 CF] = 4,042.7 CF CHAMBER STORAGE

15,209.5 CF FIELD - 4,042.7 CF CHAMBERS = 11,166.8CF STONE X 40.0% VOIDS = 4,466.7 CF STONE STORAGE

OVERALL
CHAMBER STORAGE + STONE STORAGE = 8,509.4 CF = 0.195AF
OVERALL STORAGE EFFICIENCY = 55.9%

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NEWBURY, NEW HAMPSHIRE
PARKING LOT 4
CHAMBER SYSTEM DETAILS

SHEET C3.06

Z:\proj\2023\220298 Mt Sunapee - Parking Lot 4\Internal\Design\DWG\Plan\220298_PARK-4-SHEET_Plan-Long_C3D PRO3 StormTech_ 4/25/2023 11:26:23 AM_ChristHenick

APPENDIX D

HOYLE TANNER

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July 17, 2023

Peter Disch
General Manager
Mount Sunapee Resort
1398 Route 103
P.O. Box 2021
Newbury, NH 03255

Re: Mount Sunapee Resort Spray Irrigation Operations
Observations from Hoyle Tanner Site Visit on June 19, 2023

Dear Mr. Disch:

Mount Sunapee Resort (the Resort) is in the process of renewing their groundwater discharge permit (GWDP) associated with the spray discharge of grey water effluent from the many septic tanks installed at the Resort. Hoyle Tanner is assisting the Resort with the GWDP renewal application. On Monday, June 19, 2023, Hoyle Tanner staff met with Kris Dubaere, wastewater operator of record, to observe the influent structure, lagoons, pump building and one of the three spray fields. We also toured the Resort to see the location of the multiple septic tanks serving the various buildings at the Resort.

One of the criteria for the GWDP renewal is to consider the planned growth at the Resort. We understand there are currently no updates to the 2020-2025 Five-Year Master Development Plan, which included a proposed new parking lot adjacent to the spray fields. Further, we understand the Resort has designed the parking lot and has applied for a Standard Dredge and Fill Wetlands permit and an Alteration of Terrain permit from the New Hampshire Department of Environmental Resources (NHDES).

Knowing the proposed parking lot is near the existing lagoons and spray fields we are sensitive to the potential impacts the proposed construction will have on the spray operations. From our site meeting with Kris Dubaere, we offer the following observations on the effluent spray system operations.

- We note the wastewater operator of record must meet the GW Discharge permit requirement to maintain one foot of unsaturated soil depth in the spray field area. When we met with Kris, he confirmed that he monitors and records the groundwater elevations before and after every spray event using piezometers located within the spray fields. He shared data showing total effluent volume pumped per spray event, followed by the piezometer readings for the spray field.

- Historic monitoring well records were compiled previously to develop a groundwater contour map, which indicates the predominant direction of groundwater flow is downgradient in the

direction of the lagoons (not toward the paved road or proposed parking area). Our review of the past 5-years' groundwater elevation data indicates the predominant direction of groundwater flow mirrors the groundwater contours from the historic records.

- If groundwater seepage or surface runoff migrates from the spray field to nearby woods or wetland areas (upgradient from the proposed parking lot) it is unclear what function the wooded soils or nearby wetlands may have to further breakdown the greywater from the spray fields.

In addition to the spray irrigation data the Resort shared with Hoyle Tanner a copy of the proposed parking lot site plan. We understand from our correspondence with you that the edge of the parking lot is approximately seventy-five feet from the clearings for the (nearest) spray field. With the proposed created wetland, the proposed clearing line gets closer – more like twenty feet from the middle field clearing, and about the same for the level spreader near the lowest spray field.

Given the proximity of the proposed parking lot improvements to the existing spray fields we recommend the Resort consider adding a surface water monitoring location during spray season to determine what, if any, downstream resources may be influenced by the upgradient spray fields. There is an existing downgradient culvert under the paved access road that appears will remain after the parking lot is constructed. Collecting one or more background samples now would be prudent. Then adding the culvert outlet as a surface water sampling location during spray season would provide meaningful performance data and inform future improvements.

We appreciate the opportunity to serve the Resort. As always, if you require additional information, please contact me at (603) 460-5160 or via email at jducharme@hoyletanner.com.

Sincerely,
Hoyle, Tanner & Associates, Inc.

Joseph M. Ducharme, Jr., PE, BCEE
Senior Vice President / Division Manager-Municipal Engineering Services

cc: File