



401 Water Quality Certification Application

**Dixville Capital, LLC
Balsams Grand Resort - Wilderness Ski Area
Errol, New Hampshire**



34 SCHOOL STREET • LITTLETON, NH 03561 • PHONE 603-444-4111 • FAX 603-444-1343 • www.horizonsengineering.com

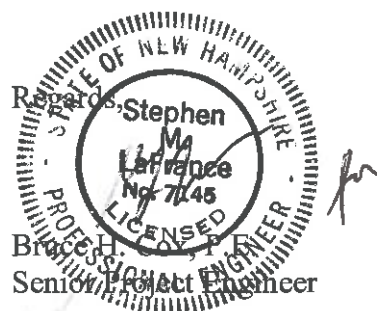
Project No. 14024
December 17, 2014

Mr. William G. Comstock
Department of Environmental Services
Water Quality Certification Program
29 Hazen drive, P.O. Box 95
Concord, NH 03302-0095

**Subject: Application for a 401 Water Quality Certification
 Snowmaking Water Withdrawal
 Dixville Capital, LLC**

Dear Mr. Comstock,

Please find attached the 401 Water Quality Certification application package for the Balsams Snowmaking Water Withdrawal project. Please contact me if you have any questions or comments.

Respectfully,

Stephen M. LaFrance
No. 7145
Professional Engineer
Senior Project Engineer

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Newport, VT 05855
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**401 WATER QUALITY CERTIFICATION APPLICATION
FOR
Dixville Capital, LLC
Balsams Grand Resort - Wilderness Ski Area**

ERROL, NEW HAMPSHIRE

DECEMBER 2014

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**401 WATER QUALITY CERTIFICATION
APPLICATION/ADDITIONAL SUBMITTAL
INFORMATION**



State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
Water Division

29 Hazen Drive, PO Box 95,
Concord, New Hampshire 03302-0095
Attn: 401 Water Quality Certification Program
Phone (603) 271-2457 Fax (603) 271-7894



APPLICATION FOR 401 WATER QUALITY CERTIFICATION

Date of Request _____

Date Request Received by DES _____

I. Applicant Information

Principal Place of Business of the Applicant Bethel, ME	
Mailing Address [Street, PO Box, RR, etc.] Dixville Capital, LLC 8 Airport Road P.O. Box 547	
City/Town and Zip Code Bethel, ME 04217	
Telephone No. 207-824-7402	Email Address burt.mills7@gmail.com
Name and Title of Signatory Official Responsible for the Activity for which Certification is Sought (e.g., President, Administrator) Burt Mills	

II. Project Information

Name of Project Snowmaking Water Withdrawal
Name of Town and County that contains the Project Errol, Coos County
Name of Receiving Waterbody and Drainage Basin Water withdrawal from the Androscoggin River, Upper Androscoggin Basin
Summary of Activity (e.g., construction, operation, or other practice or action) Construction of a snowmaking water withdrawal intake. The intake will withdraw a maximum of 34 cfs (2,937,600 cubic feet per day) from the river on an intermittent basis between November 1 and March 15.

III. Additional Submittal Information **See attached sheets**

PLEASE SUBMIT IN ELECTRONIC FORMAT AS MUCH INFORMATION AS POSSIBLE

Please provide an individual response to each bullet, below. If applicable information is contained in the application materials, please provide a reference to the specific section in the application materials that will represent the response to the individual bullets, below.

- Type of activity (e.g., construction, operation, other action such as water withdrawal) and the start and end dates of the activity.
- The characteristics of the activity: Whether the activity is associated with a discharge and/or water withdrawal and whether the discharge and/or withdrawal is proposed or occurring.
- The characteristics of the discharge and/or withdrawal
 - o Flow rate (cfs)
 - o Potential chemical, physical, biological constituents
 - o Frequency (e.g., daily, hourly,)
 - o Duration
 - o Temperature (Celsius)
 - o Latitude and longitude (dd:mm:ss)
- The existing and designated use(s) that are potentially affected by the proposed activities. (Designated Uses are listed in the DES Consolidated Assessment and Listing Methodology).
- The provision(s) of surface water quality standards (Env-Wq 1700) that are applicable to the designated uses affected by the proposed activities.
- A pollutant loading analysis to show the difference between pre-development and post-development pollutant loads for a typical year. The objective of the loading analysis is to show post-development pollutant loads do not exceed pre-development pollutant loads. Loading analysis guidance and a simple spreadsheet model will be provided by DES. The loading analysis will be used to determine appropriate stormwater management measures, which must be effectively designed, installed, and maintained to ensure compliance with surface water quality standards.
- A description of any other aspect of the activity that would affect the chemical composition, temperature, flow, or physical aquatic habitat of the surface water.
- An original or color copy/reproduction of a United States Geological Survey Quadrangle Map that clearly shows the location of the activity and all potential discharge points.
- A copy of the final complete federal permit application or federal license application, including the federal permit, license, or project number.
- A copy of the DES wetlands permit (RSA 482-A:3), if necessary.

REQUEST FOR 401 WATER QUALITY CERTIFICATION (cont.)

- A copy of the DES alteration of terrain permit (RSA 485-A:17), if necessary.
- The name(s) and address(es) of adjoining riparian or littoral abutters.
- A plan showing the proposed activities to scale including:
 - o The location(s) and boundaries of the activities;
 - o The location(s), dimension(s), and type(s) of any existing and/or proposed structures; and
 - o The location(s), name(s), identification number(s), and extent of all potentially affected surface water bodies, including wetlands.

Signature - MUST BE SIGNED AND DATED BY APPLICANT

To the best of my knowledge, the data and information described above, which I have submitted to the New Hampshire Department of Environmental Services, is true and correct. I understand that an approval of the requested 401 Certification based upon incorrect data may be subject to revocation of the 401 Certification. I have complied with all local regulations or ordinances relative to the proposed activity and have obtained or will obtain, prior to the commencement of any work, all other approvals that may be required.

Signed: _____

Date: _____

APPLICATION FOR WATER QUALITY CERTIFICATION

BALSAMS RESORT SNOWMAKING LINE ANDROSCOGGIN RIVER INTAKE

III. Additional Submittal Information

- Type of activity (e.g., construction, operation, other action such as water withdrawal) and the start and end dates of the activity.

The project is the construction and operation of a snowmaking water withdrawal to serve proposed improvements at the Balsams Grand Resort Wilderness Ski Area located in Dixville Notch, New Hampshire. The intake will be located approximately 1,700 feet downstream of the Errol dam on the Androscoggin River in Errol, New Hampshire. At this time, plans call for two (2) 36" diameter intake pipes will be located approximately 30 feet easterly of the west bank of the river. The top of the pipes will be a minimum of four (4) feet below normal water. A pump station will be constructed on the west bank of the river. Final design for the intakes and pump station has not yet been completed. Design plans will be submitted to NHDES when they are available. The intake will be used to withdraw up to 34 cfs (2,937,600 cubic feet per day) between November 1 and March 15.

- The characteristics of the activity: Whether the activity is associated with a discharge and/or water withdrawal and whether the discharge and/or withdrawal is proposed or occurring.

The activity is associated with a water withdrawal. The activity is proposed.

- The characteristics of the discharge and/or withdrawal.
 - Flow rate: maximum of 2,937,600 cubic feet per day based on a 34 cfs withdrawal rate for 24 hours.
 - Potential chemical, physical, biologic constituents: *none*
 - Frequency (e.g., daily hourly,): *on an intermittent, as-needed basis during the snowmaking season (November 1 through March 15). May be continuous for a portion of the season as temperatures and conditions allow.*
 - Duration: *for as much as 24 hours per day.*
 - Temperature (Celsius): *not applicable, there is no change in water temperature.*
 - Latitude and longitude (dd:mm:ss): latitude 44:46:59 longitude 71:07:44

- The existing and designated use(s) that are potentially affected by the proposed activities. (Designated Uses are listed in the DES Consolidated Assessment and Listing Methodology).

The designated uses that are potentially affected by the proposed activity are aquatic life and wildlife.

- The provision(s) of surface water quality standards (Env-Wq 1700) that are applicable to the designated uses affected by the proposed activities.

The only provision of the water quality standards that is applicable to the designated uses is flow.

- A pollutant loading analysis to show the difference between pre-development and post-development pollutant loads for a typical year.

Not applicable, there are no pollutant loads associated with this activity.

- A description of any other aspect of the activity that would affect the chemical composition, temperature, flow, or physical aquatic habitat of the surface water.

The withdrawal system will remove a maximum of 34 cfs (2,937,600 cubic feet per day) from the river between November 1 and March 15. The New England Flow Policy has been established by the US Fish & Wildlife Service. The Policy set the Aquatic Base Flow (median August flow) as 0.5 cubic feet per second per square mile of drainage area (csm). The USF&WS further recommends a minimum flow rate of 1.0 csm in the fall and winter and 4.0 csm in the spring for the entire spawning and incubation periods.

The Federal Energy Regulatory Commission (FERC) permit for the Errol Dam hydropower project approximately 1,700 feet upstream of the proposed intake requires a minimum release of 0.5 csm (see Attachment A for relevant excerpts). As the hydropower facility only has to release 0.5 csm it makes no sense to hold the applicant to a more stringent requirement. It is noted, however, that flow records show this rate is exceeded the great majority of the time (see attached daily mean flow data from the USGS).

The United States Geological Survey (USGS) maintains a gaging station (#01053500) at essentially the same location as the proposed intake. The gage has a drainage area of 1,046 square miles and a period of record of January 1, 1905 through the present. Horizons Engineering prepared an analysis of daily mean flows for the period through August 2014 (see Attachment B). This was done for two scenarios; the full continuous record and on a seasonal basis as defined by NHDES. The analysis includes the regulatory 0.5 csm (523 cfs) and the more restrictive 1.0 csm (1,046 cfs) standard for comparison purposes. The proposed maximum withdrawal rate is 34 cfs resulting in minimum pre-withdrawal river flows of 557 cfs and 1,080 cfs respectively. The results are summarized in the following table.

Summary of Minimum Flow Analysis

<i>0.5 csm Criterion (557 cfs)</i>		<i>1.0 csm Criterion (1,080 cfs)</i>	
	<i>% Time Exceeded</i>		<i>% Time Exceeded</i>
<i>Full Record</i>	<i>99.4</i>	<i>Full Record</i>	<i>92.8</i>
<i>Fall</i>	<i>99.0</i>	<i>Fall</i>	<i>88.7</i>
<i>Winter</i>	<i>99.9</i>	<i>Winter</i>	<i>94.5</i>

We conclude that with the maximum withdrawal of 34 cfs, flow in the river will be in conformance with the FERC permit and the New England Flow Policy. As conformance with the New England Flow Policy has been demonstrated it is concluded that any potential effects on aquatic life will be negligible. The withdrawal of 34 cfs will likely have an immeasurable effect on water surface elevations. We conclude that any potential effect on wildlife will be negligible.

The next identified downstream water user is a hydropower dam in the Town of Dummer approximately 17 miles downstream. Between these two points the drainage area increases from 1,046 square miles to 1,384 square miles. We conclude that an intermittent loss of 34 cfs is negligible on that operation and is in compliance with the FERC permit for the upstream Errol Dam project.

- An original or color copy/reproduction of a United States Geological Survey Quadrangle map that clearly shows the location of the activity and all potential discharge points.

An excerpt of the USGS quadrangle map in color is included as Attachment A.

- A copy of the final complete federal permit application or federal license application, including the federal permit, license, or project number.

No federal permits are anticipated for this project.

- A copy of the DES wetland permit (RSA 482-A:3), if necessary.

Field investigation for the Wetland Permit is in progress. A copy of the permit application will be submitted when completed.

- A copy of the DES alteration of terrain permit (RSA 485-A:17), if necessary.

Not applicable, an alteration of terrain permit is not required.

- The name(s) and address(es) of adjoining riparian or littoral abutters.

A list of abutters is included as Attachment B.

- A plan showing the proposed activities to scale:

Concept plans of the proposed activity are included as Attachment C. Final design plans will be forwarded to NHDES when they become available.

**ATTACHMENT A - HYDROLOGY SUMMARY –
ANDROSCOGGIN RIVER**

BALSAMS GRAND RESORT WILDERNESS SKI AREA HYDROLOGY SUMMARY – ANDROSCOGGIN RIVER

INTRODUCTION AND METHODOLOGY

Basic streamflow statistics have been prepared as part of the proposed snowmaking water source analysis.

The analysis uses mean daily flow data obtained from the United States Geological Survey (USGS) for gage #01053500, Androscoggin River at Errol, NH. The gage has a drainage area of 1,046 square miles and a published period of record from January 1, 1905 through the present (August 24, 2014 date of analysis). The only period of missing data is from November 1, 1912 through December 31, 1912. In addition, there are eight (8) other dates that show a mean daily discharge of 0 cfs. These dates have been eliminated from the analysis.

The analysis was done for two scenarios; the full continuous record and on a seasonal basis. Per the NHDES publication "Methods for Estimating Instream Flow Requirements for Protection of Aquatic Life" (November 16, 2010) the seasons are described as:

- Winter – January 1 through March 15
- Spring – March 16 through June 30
- Summer – July 1 through October 31
- Fall – November 1 through December 31

In each scenario the Q60, Q70, Q80, Q90, Q95, and 7Q10 were determined. For reference, Q60 is defined as the flow exceeded 60% of the time, and 7Q10 is defined as the lowest 7 day average flow with a non-exceedance probability of 10%. Methodology is basically described as ranking the daily flows from lowest to highest. A % time exceeded is assigned to each entry using the formula (# of data points/ number of data points plus 1) x 100. As the proposed water withdrawal point is just downstream of the gage, no drainage area-discharge adjustment is necessary.

The results for each scenario are summarized below:

Non-Seasonal Summary

% Time Flow Exceeded	Flow (cfs)
60	1,590
70	1,470
80	1,340
90	1,150
95	987
7Q10	465

Seasonal Summary

Season	% Time Flow Exceeded	Flow (cfs)
Winter	60	1,690
	70	1,560
	80	1,390
	90	1,170
	95	1,060
	7Q10	826
Spring	60	1,690
	70	1,510
	80	1,330
	90	1,120
	95	916
	7Q10	578
Summer	60	1,580
	70	1,490
	80	1,380
	90	1,240
	95	1,100
	7Q10	766
Fall	60	1,440
	70	1,340
	80	1,210
	90	1,050
	95	899
	7Q10	703

DISCUSSION

There are two generally used "rules of thumb" for the minimal flow that must be maintained in a stream. The default value is 0.5 cubic feet per second per square mile of drainage area (csm). Depending on the presence of certain species, this is seasonally adjusted to be 1.0 csm for the fall/winter period, and 4.0 csm for the spring period. It is noted, however, that the intake is approximately 1,700 feet downstream of the Errol Dam. The current FERC permit for the hydropower project requires a minimum release of 522 cfs which corresponds to the 0.5 csm criterion. Therefore, this has to be viewed as the current regulatory framework for the minimum flow to be maintained in the river. It is the applicants request that any future minimum release requirements for the snowmaking project be tied to the current effective FERC permit.

Notwithstanding the above, the analysis has been completed for both 0.5 csm (523 cfs) and for 1.0 csm (1,046cfs). Snowmaking is generally restricted to the fall/winter period. The maximum withdrawal rate will be 34 cfs. Therefore the flow rates that must be maintained in the river at

the gage under both scenarios are 557 cfs and 1,080 cfs respectively. Results are presented in the table below.

Summary of Minimum Flow Analysis

0.5 csm Criterion (557 cfs)		1.0 csm Criterion (1,080 cfs)	
	% Time Exceeded		% Time Exceeded
Full Record	99.4	Full Record	92.8
Fall	99.0	Fall	88.7
Winter	99.9	Winter	94.5

USGS 01053500 Androscoggin River at Errol, NH

Available data for this site

Time-series: Daily statistics



GO

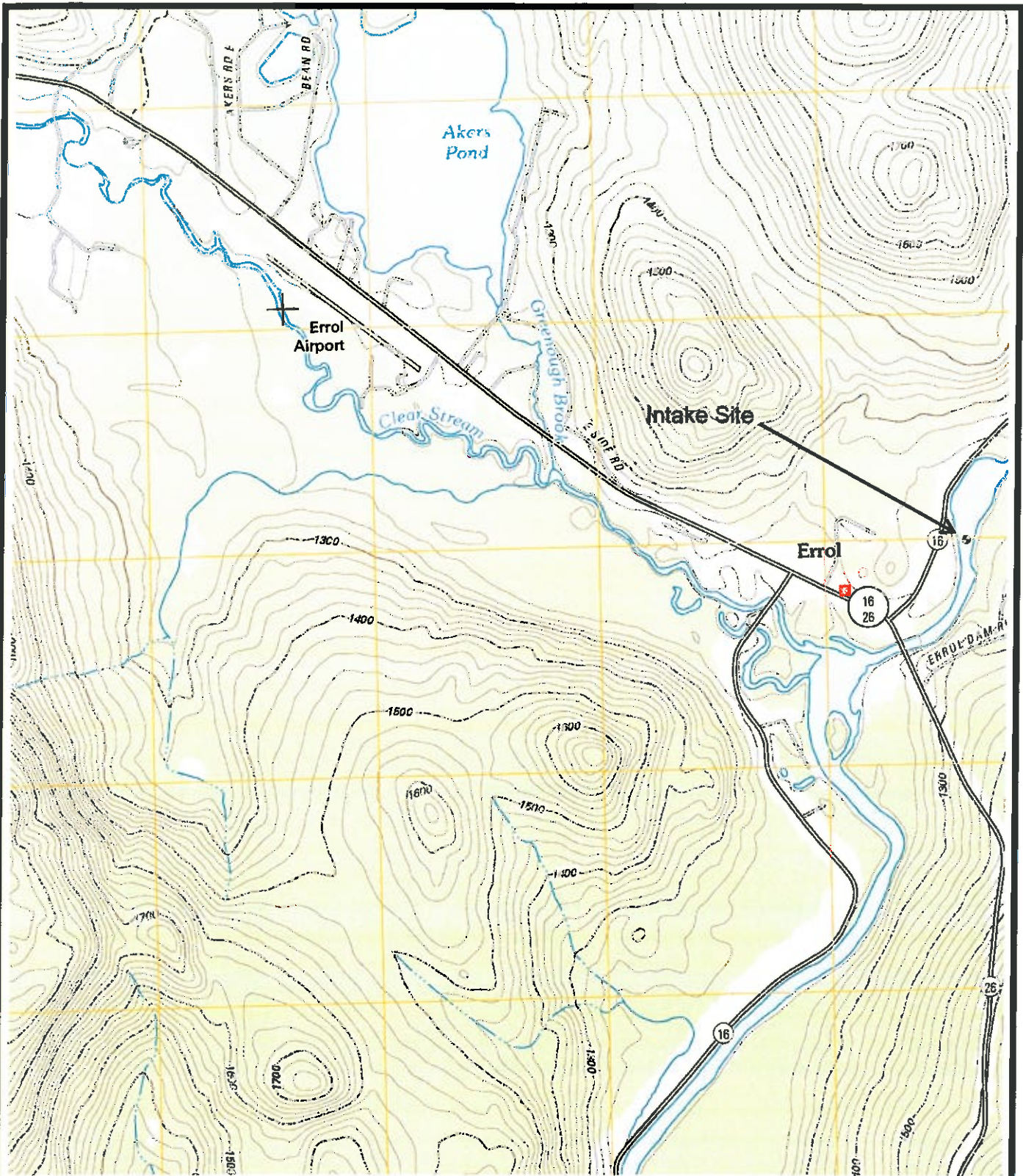
Output formats	
<input type="checkbox"/>	HTML table of all data
<input type="checkbox"/>	Tab-separated data
<input type="checkbox"/>	Reselect output format

Coos County, New Hampshire
 Hydrologic Unit Code 01040001
 Latitude 44°46'57", Longitude 71°07'43" NAD83
 Drainage area 1,046 square miles
 Contributing drainage area 1,046 square miles
 Gage datum 1,227.30 feet above NGVD29

00060, Discharge, cubic feet per second, Day of Mean of daily mean values for each day for 107 - 109 years of record in, ft ³ /s (Calculation Period 1904-10-01 -> 2013-09-30)												
month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1,860	1,910	1,970	1,960	3,120	2,600	2,070	1,710	1,670	1,620	1,570	1,700
2	1,850	1,910	1,960	2,020	3,140	2,500	2,050	1,720	1,680	1,630	1,550	1,690
3	1,850	1,890	1,970	1,980	3,230	2,460	2,010	1,710	1,670	1,630	1,540	1,700
4	1,840	1,890	1,980	1,930	3,340	2,470	1,960	1,700	1,670	1,620	1,560	1,730
5	1,840	1,900	1,980	1,870	3,420	2,470	1,950	1,680	1,690	1,640	1,600	1,720
6	1,830	1,910	1,980	1,860	3,370	2,410	1,920	1,700	1,720	1,640	1,610	1,680
7	1,830	1,910	2,000	1,860	3,340	2,360	1,870	1,730	1,720	1,650	1,620	1,630
8	1,830	1,910	1,990	1,890	3,300	2,270	1,830	1,740	1,710	1,650	1,610	1,620
9	1,830	1,920	1,980	1,920	3,310	2,230	1,790	1,730	1,700	1,650	1,650	1,640
10	1,810	1,930	1,960	1,950	3,330	2,250	1,800	1,720	1,680	1,650	1,680	1,660
11	1,810	1,920	1,970	1,910	3,400	2,340	1,800	1,700	1,730	1,640	1,640	1,680
12	1,830	1,920	1,950	1,860	3,280	2,410	1,770	1,690	1,780	1,630	1,640	1,680
13	1,820	1,920	1,930	1,890	3,310	2,360	1,760	1,700	1,780	1,630	1,620	1,700
14	1,810	1,920	1,880	1,920	3,270	2,320	1,750	1,690	1,740	1,620	1,600	1,740
15	1,820	1,920	1,880	1,950	3,250	2,400	1,750	1,700	1,740	1,650	1,600	1,790
16	1,830	1,920	1,890	2,010	3,240	2,450	1,770	1,700	1,740	1,680	1,630	1,820
17	1,850	1,930	1,900	2,120	3,180	2,480	1,770	1,690	1,730	1,690	1,690	1,840
18	1,860	1,930	1,900	2,210	3,110	2,480	1,770	1,700	1,740	1,690	1,750	1,880
19	1,870	1,930	1,980	2,270	3,120	2,450	1,770	1,690	1,730	1,680	1,730	1,880
20	1,880	1,930	2,020	2,350	3,070	2,420	1,750	1,690	1,710	1,660	1,680	1,860
21	1,880	1,940	1,980	2,410	3,060	2,380	1,770	1,690	1,680	1,630	1,650	1,860
22	1,880	1,960	1,930	2,470	3,130	2,320	1,770	1,700	1,700	1,630	1,640	1,900
23	1,880	1,960	1,930	2,590	3,050	2,250	1,750	1,690	1,680	1,640	1,640	1,900

24	1,870	1,970	1,930	2,740	2,890	2,180	1,760	1,680	1,640	1,630	1,650	1,900
25	1,850	1,950	1,900	2,820	2,800	2,070	1,780	1,680	1,650	1,590	1,650	1,890
26	1,850	1,930	1,890	2,900	2,740	1,980	1,770	1,670	1,650	1,620	1,630	1,870
27	1,870	1,920	1,830	2,880	2,730	1,990	1,730	1,700	1,650	1,630	1,670	1,850
28	1,870	1,950	1,840	2,830	2,670	2,000	1,700	1,710	1,640	1,640	1,710	1,850
29	1,890	2,090	1,840	2,960	2,600	2,080	1,670	1,680	1,640	1,670	1,720	1,870
30	1,900		1,840	3,080	2,550	2,090	1,650	1,680	1,620	1,660	1,720	1,870
31	1,900		1,880		2,580		1,660	1,670		1,600		1,860

**ATTACHMENT B - SNOWMAKING WATER
WITHDRAWAL – SITE LOCATION MAP**



34 School Street
Littleton, NH 03561
Phone: 603.444.4111 – Fax 603.444.1343

DIXVILLE, LLC

**401 WATER QUALITY CERTIFICATION
SNOWMAKING WATER WITHDRAWAL
ERROL, NEW HAMPSHIRE**

SITE LOCATION MAP

PROJECT #:

14024

ENGINE'D BY:

BHC

DRAWN BY:

BHC

DATE:

NOV 6, 2014

**ATTACHMENT C - SNOWMAKING LINE –
ANDROSCOGGIN RIVER INTAKE**



SNOWMAKING LINE PLAN
SCALE AS SHOWN

LEGEND

- RIGHT OF WAY - CENTERLINE OFFSET, NOT FROM PLANS
- RIGHT OF WAY - FROM NHDOT PLANS
- ROAD CENTERLINE
- 24" W --- PROPOSED 24" WATER MAIN
- MP 022.2 --- APPROXIMATE NHDOT MILE MARKER

34 School Street
Littleton, NH 03561
Phone 603.444.4111 - Fax 603.444.1343

DIXVILLE CAPITAL, LLC

BALSAMS RESORT SNOWMAKING LINE
CONCEPT PLAN NH ROUTE 26
ERROL, MILLSFIELD, AND DIXVILLE, NEW HAMPSHIRE

ANDROSCOGGIN RIVER INTAKE
DOWNTOWN ERROL

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: DEC 2014
PROJECT #: 14038

ENGINE'D BY: SML
DRAWN BY: MAH

CHECK'D BY: SML
ARCHIVE #: H-5165

DATE OF PRINT
DEC 17 2014
HORIZONS ENGINEERING

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SHEET 3 OF 9

NOT FOR CONSTRUCTION