

**APPENDIX H  
POST CONSTRUCTION MAINTENANCE MANUAL**

**APPENDIX I  
SHUMAKER SWPPP FOR DISCOVERY LODGE EXPANSION**

# STORMWATER POLLUTION PREVENTION PLAN

Discovery Lodge  
Belleayre Mountain Ski Area  
181 Galli Curci Road  
Highmount, New York

Prepared for

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SCE Project No. 06124.00

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# **NOTICE OF INTENT**

# **CERTIFICATION FORMS**

**CONTRACTOR/SUBCONTRACTOR CERTIFICATION**

*Discovery Lodge at Belleayre Mountain Ski Center*

*Rehabilitation & Addition*

*Highmount, New York*

*“I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (“SPDES”) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.”*

<b>Contractor/Subcontractor Responsibilities</b>
<ul style="list-style-type: none"><li>• _____</li><li>• _____</li><li>• _____</li></ul>

<b>Owner/Operator Signature</b>
_____
Name
_____
Title
_____
Company

<b>Authorized Signature</b>
_____
Name
_____
Title
_____
Company
_____
_____
Address
_____
Telephone

<b>Additional Information</b>
The trained individual(s) responsible for SWPPP implementation on behalf of this Contractor/Subcontractor will be:
_____
Name
_____
Title
_____
_____
Name
_____
Title

**NOTE:** MAKE ADDITIONAL COPIES OF THIS CONTRACTOR’S CERTIFICATION, AS REQUIRED. A CERTIFICATION SHALL BE SIGNED BY ANY CONTRACTOR AND SUBCONTRACTOR CONDUCTING WORK ACTIVITIES AT THE IDENTIFIED SITE.

**QUALIFIED PROFESSIONAL’S CERTIFICATION**

*Discovery Lodge at Belleayre Mountain Ski Center  
Rehabilitation & Addition  
Highmount, New York*

*I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.*

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## 1.0 INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared in support of a construction project at the Belleayre Mountain Ski Area, located in Ulster County, New York. This plan has been prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) for Stormwater Discharges from Construction Activity under Permit No. GP-0-10-001, attached as Appendix A. Techniques incorporated in the project design, as well as the soil erosion and sedimentation control measures made part of this SWPPP conform to the most current editions of the New York State Stormwater Management Design Manual (Design Manual) and the New York Guidelines for Urban Erosion and Sediment Control available at the time of this report. This document specifically details the sediment and erosion control measures to be implemented at this site and establishes the Water Quality Controls and Water Quantity Volume Controls to be used during the construction process. In addition, this document provides design criteria and a full description of the operation of permanent post-construction stormwater quantity and quality control measures.

Additionally, due to the location of this project, this design will comply with the New York City Department of Environmental Protection (NYCDEP) regulations entitled Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and Its Sources, Final Regulations Effective May 1, 1997 as amended April 14, 2010.

## 2.0 USE OF THIS DOCUMENT

In accordance with the New York State SPDES General Stormwater Permit for Construction (Permit GP-0-10-001), a copy of this SWPPP, as well as a copy of the Site Sediment and Erosion Control Plan, must be retained on the site at all times during construction. It is the responsibility of the Owner to ensure that all elements of this plan are implemented and enforced by all construction trades during construction, until the site has undergone complete stabilization. A copy of this SWPPP must be retained on site from the initiation of construction through final site stabilization.

This SWPPP may be amended as required to accommodate changed project conditions. At a minimum, the Owner is responsible to amend this SWPPP:

- Whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater discharges from the site.
- Whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the discharge of pollutants.
- To address deficiencies identified during an inspection by the qualified inspector or the NYSDEC.

The copy of this SWPPP that will be maintained at the site must be continually updated to incorporate all site inspection reports and site work-related correspondence. The Notice of Intent (NOI), SWPPP, and all inspection reports required by GP-0-10-001 are considered public documents that the Owner must make available for review and copying by any person within 5 business days following a written request to review these documents. Copying of documents will be done at the requester's expense.

The Facility will retain copies of this SWPPP and any reports submitted in conjunction with this permit and records of all data used to complete the NOI covered by this permit for a period of at

least 5 years following final site stabilization. NYSDEC may, at its sole discretion, require monitoring of discharges from the permitted construction activity.

## **3.0 PROJECT BACKGROUND**

### **3.1 PRE-CONSTRUCTION CONDITIONS**

#### **3.1.1 Project Location**

The project site is situated to the southwest of the community of Highmount in Ulster County, New York and to the southeast of the Village of Fleischmanns in Delaware County, New York. The site is located on the south side of Galli Curci Road, an extension of Old Schoolhouse Road to the south of Highmount as shown in Figure 1.

#### **3.1.2 Project Limits and Existing Conditions**

The project site is a portion of a New York State owned ski facility, wherein the intended limits of disturbance will encompass only approximately 3.24 acres out of a total 7.49 acre drainage subarea at the ski facility. The intended area of disturbance is mainly comprised of existing buildings, site access road(s), and parking area, however perimeter grading and surface modifications required for site vehicle and pedestrian access will further expand the total area impacted by construction. It has been a goal under the Leadership in Energy and Environmental Design (LEED) certification process for the site to minimize the footprint of the area impacted by construction. There are two prominent buildings located at the site. The larger of the two buildings, the multi-story Discovery Lodge, which covers approximately 14,000 sf in plan and houses a majority of the indoor activities, such as dining areas, locker rooms, bathroom facilities, and an outfitter shop. The smaller of the buildings is only 600 sf in plan and is the current location for ticket sales and collections. Currently, the total amount of impervious land area on the site is 0.97 acre. Following construction, the total amount of impervious surfaces will be 1.628 acres.

A map showing the intended area of disturbance is attached as Figure 2.

### **3.1.3 Soils**

A soil map generated for the project site from the Natural Resource Conservation Service (NRCS) On-Line Soil Survey is provided as Appendix B. This map shows that the site generally consists of cut and fill land, Lackawanna and Swartswood bouldery soils, and Wellsboro and Wurtsboro bouldery soils. Based on the soil limits shown on this map, construction will be primarily limited to the Lackawanna and Swartswood soils.

The Lackawanna and Swartswood series are described as typically well to moderately well drained soils. However, it has been determined that the soils at this site are somewhat poorly drained based on field investigations, observations of test pits, and soil percolation tests. Therefore, the soils to be disturbed at the site are considered to be Hydrologic Group “C” soils throughout the stormwater calculations. Soil borings completed during an earlier phase of the work, as well as copies of notes from field investigations and soil infiltration tests, are included as Appendix C.

Hydrologic Group “C” soils have low infiltration rates when thoroughly wetted. Soil particles associated with this group are generally very fine to fine. Hydrologic Group “C” soils have a high runoff potential and for the purposes of this stormwater design, will contribute to a conservative design approach for the stormwater control measures to be implemented at this site.

Stormwater infiltration tests performed on November 2, 2007, and December 2-3, 2010, resulted in stabilized infiltration rates varying from 11 inches per hour to greater than 34 inches per hour. Therefore, an infiltration rate of representative of the area of the stormwater practice will be used as the basis of natural exfiltration throughout this design. A summary of infiltration testing completed at the site is provided as Appendix D.

### **3.1.4 Historic Places Review**

Under GP-0-10-001, the proposed site must be screened for historic significance pursuant to the New York State Office of Parks, Recreation, and Historic Places (OPRHP). Based on an evaluation of existing archaeological data (Appendix E), the site contains no Historic Places; however, may be situated in an Archaeological Sensitive area.

## **3.2 POST-CONSTRUCTION CONDITIONS**

### **3.2.1 Proposed Construction**

The proposed development of the site includes two (2) distinct construction phases. The first phase of the project includes performing all sitework and construction required to add a new wing to Discovery Lodge which will provide an expanded program space, a new ski rental shop, administrative offices, and improved circulation patterns. In addition, this phase will include the demolition and removal of the smaller ticket kiosk building, improved traffic flow patterns and parking, provisions for accessibility parking and pedestrian flow, and drainage and site layout improvements to the overall site. Phase I of this project includes the construction of a new service driveway to the north, along with a large diameter steel culvert. The new service driveway will result in improved traffic flow patterns at the main entrance and will also enable preferred parking spaces to be situated in the main parking lot instead of near the main entrance.

Phase II of the project includes the partial demolition and reconstruction of the Discovery Lodge building and restoring the surrounding area. Combined, both phases of the proposed construction will disturb nearly 3.24 acres and result in impervious surfaces totaling 1.628 acres. Refer to Figure 3 for the approximate limits of each phase of the project.

Prior to this project, NYSDEC forces will be making major changes to the site access roadway which will include a new large diameter culvert, new pedestrian bridge, and layout modifications

to the existing main driveway surface. Construction of Phase I described herein is expected to begin in the Spring and has an estimated completion date of Fall of that same year. Phase II will take place the following year, from the conclusion of Phase I through the Fall of the following year.

It should be noted that although the total disturbed area will be nearly 3.24 acres, the entire drainage area which includes the site is comprised of a total of 7.49 acres. With the exception of the upland areas, the existing drainage patterns associated with the post-construction condition will remain largely unchanged. The portion of the site that will be drained by the designed stormwater management system will include all pervious surfaces, and green areas that have been graded to change the direction of flow, or re-engineered to direct previously untreated discharges into the stormwater management in system.

## 4.0 CONSTRUCTION PHASING

Construction at the site is currently programmed for a 2-year duration. Initial construction or Phase I activities at the site are expected to begin in the Spring. The following sequence outlines the expected construction events:

1. Installation of sediment and erosion control measures, including silt fencing, stabilized construction entrance, silt dams, temporary swale, and temporary sediment trap as shown on the drawings.
2. Removals of pavements, surfaces, and identified site structures.
3. Clearing and grubbing, rough grading of site.
4. Installation of site utilities and piping.
5. Import structural fill and grade.
6. Construction of the new additions at Discovery Lodge.
7. Installation of subbase material, asphalt pavement, concrete pavement, and finish grade.
8. Construction of permanent stormwater practices.
9. Site stabilization, seeding, and mulching.

Phase II activities will commence during the subsequent construction season and will be primarily focused on the partial demolition and near complete reconstruction of the original structure of Discovery Lodge. Phase II will be comprised of the following work elements:

1. Installation of Phase II sediment and erosion control measures (Note: Permanent stormwater quality and quantity controls will already be installed as part of Phase I).
2. Prepare equipment and material storage and staging areas on site.
3. Partial demolition of existing Discovery Lodge.
4. Renovation and reconstruction of Discovery Lodge.
5. Final site restoration, seeding and mulching, and final resurfacing of roads.

## **5.0 DESCRIPTION OF TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES**

During Phase I and Phase II construction phases, temporary sediment and erosion control measures will consist of temporary and permanent structural practices to prevent the migration of soil from the site, or to prevent significant run-on from upgradient locations. A new permanent upland diversion swale located along the southern edge of the project site will eliminate the need for permanent measures to manage most stormwater run-on from upgradient and off site sources.

The following sections describe various temporary sediment and erosion control practices that will be employed at the site. All temporary measures will be installed pursuant to the Sediment and Erosion Control Plan, and in conformance with the New York Standards and Specifications for Erosion and Sediment Control, published by the Empire State Soil and Water Conservation Society.

A detailed Sediment and Erosion Control Plan has been created for this project. The Sediment and Erosion Control Plan, as well as specific construction details, are included as Appendix F herein.

### **5.1 PHASE I SEDIMENT AND EROSION CONTROLS**

Phase I activities will present the major earthwork portion of this overall project. During Phase I, a majority of the temporary sediment and erosion control practices will be maintained in place; however, some will be required to be retained through the Phase II activities. It is particularly important to prevent sediment from accumulating in the permanent stormwater quality treatment practices during the construction period. Hence, the installation and maintenance of temporary measures is paramount to the long-term success of the overall stormwater management plan for the site. Temporary erosion control measures will include the following:

### **5.1.1 Silt Fence**

Silt fence will be utilized primarily around the downgradient site perimeter to prevent sediment from running off the site onto adjacent parcels. Silt fence may be utilized as required to prevent erosion in other localized locations prior to site stabilization. In all cases, silt fence will be placed around the perimeter of soil stockpiles to prevent erosion in these susceptible locations. Proper installation of silt fence with an alignment along with (e.g., parallel with) site topographic contours.

### **5.1.2 Stabilization**

All disturbed areas, regardless of size, shall be seeded and mulched by the Contractor within 1 week of final grading. In cases where work areas will not be final graded within 1 week of disturbance, the site shall be temporarily mulched and seeded regardless of the presence of other sediment and erosion control structures in the vicinity of the disturbance. Mulching may consist of hydroseeding or spreading of clean straw as elected by the Contractor.

### **5.1.3 Inlet Protection**

All catch basins left intact during the construction period will be protected from receiving potentially turbid water departing the site. Inlet protection around the catch basin will consist of the installation of silt fencing on a heavy duty frame around the perimeter of the structure. All new catch basins will also be fitted with inlet protection to remain in place until the drainage area around the new catch basin is stabilized.

#### **5.1.4 Triangular Silt Dikes**

Triangular silt dikes will be utilized as check dams across cutoff swales and drainageways constructed as part of this project. Triangular silt dikes are comprised of geotextile wrapped expanded foam “triangles” and provides flow and sedimentation controls along water courses. Stone check dams may be substituted in lieu of triangular silt dikes; however, the maintenance and removal of stone check dams is viewed as more difficult.

#### **5.1.5 Temporary Sediment Traps**

A total of two (2) temporary sediment traps will be constructed as part of Phase I of the project. Temporary sediment traps will be constructed in the proposed site of the Dry Swale SMP to the south of Discovery Lodge, and also in the location of the northern-most bio-retention SMP to the northwest of the facility. The sedimentation basins’ capacity will vary, and have been based on the upgradient contributing disturbed areas. Following their function as sediment traps toward the end of the first construction phase, these earth structures will be converted to the permanent SMPs including a dry swale and bio-retention sedimentation basin.

#### **5.1.6 Erosion Control Blankets**

Disturbed slopes with grades greater than 3 percent will be stabilized with seed, mulch, and erosion control blankets. Constructed of jute mesh, or reinforced straw or excelsior product, erosion control blankets are securely staked in place on slopes to prevent severe erosion in these areas. Stakes and placement of erosion control blankets can vary based on manufacturer; however, typical installation requires that the blanket be unrolled up and down the slope face to create the most effective barrier to erosion.

### **5.1.7 Stabilized Construction Entrance**

A portion of the driveway entrance will be utilized as the stabilized construction entrance for the project. This gravel surface will assist in removing mud and accumulated soil from vehicles prior to departing the work area. Sometimes referred to as anti-tracking pads, a properly constructed and maintained construction entrance will prevent the off-site migration of soil through vehicle tracking. In the event that tracking does occur, the Contractor will be required to sweep and recover soil tracked onto off-site roads.

### **5.1.8 Stone Outlet Protection**

Weirs and outfalls must be stabilized and protected to prevent erosion created by high velocity water passing through them. Stone outlet protection will be primarily utilized at pipe outlets, swale outlets, and weir overflows that will remain in place following construction.

### **5.1.9 Permanent Upland Diversion Swale**

The site grading plan includes a permanent diversion swale included to reduce run-on from the ski slopes to the south of the new construction. The diversion swale is planned to be a grassy swale and collects run-on from the slopes immediately south of Discovery Lodge and directs them in an easterly direction, away from the site stormwater collection and management systems. The grassy swale measures approximately 5-feet (nominal) at the base with 1:3 (nominal) side slopes for a total depth of approximately 1.5 feet. The bottom slope of the swale averages approximately 5 percent, which results in the channel's total capacity of 192 CFS.

The upland diversion swale discharges through a level spreader where the water flows across a grassed ski slope and then into a densely wooded area. The level spreader was designed based on the swale's calculated output during the 10-year design storm of approximately 12 cfs.

The diversion swale is sized to collect water from approximately 4.25 acres of upgradient ski slopes and woods, and divert water up to and including the 100-year design storm. Based on a TR-55 stormwater runoff analysis of this upgradient area (see Appendix G for calculations), the total run-on is calculated at 19.63 cfs, which is well within the swale's capacity of 192 cfs for redirecting the stormwater run-on to the west, toward Crystal Brook.

## **5.2 PHASE II SEDIMENT AND EROSION CONTROLS**

During Phase II activities, most of the disturbed site will have been restored, and many of the sediment and erosion controls installed as part of Phase I will have been removed. Phase II is projected to disturb less outside area at Discovery Lodge and most of the sediment and erosion controls will be targeted at the protection of stored materials and prevention of sediment from entering the newly constructed storm sewer system.

The following sediment and erosion controls will be used during Phase II events:

### **5.2.1 Silt Fence**

Similar to Phase I, silt fence will be used in areas subject to erosion and will be placed along to site topographic contours. Silt fence shall remain in place until the site is completely stabilized. The amount of silt fence used for Phase II is much less than the amount used in Phase I.

### **5.2.2 Inlet Protection**

As with Phase I, all catch basins intact during the construction period will be protected from receiving potentially turbid water departing the site. Inlet protection will remain in place until the site is completely stabilized because it is paramount to protect the permanent stormwater quality measures.

### **5.2.3 Site Stabilization**

All disturbed areas, regardless of size, shall be seeded and mulched by the Contractor within 1 week of final grading. In cases where work areas will not be final graded within 1 week of disturbance, the site shall be temporarily mulched and seeded regardless of the presence of other sediment and erosion control structures in the vicinity of the disturbance. Mulching may consist of hydroseeding or spreading of clean straw as elected by the Contractor.

### **5.2.4 Triangular Silt Dikes**

Triangular silt dikes will remain in place across the diversion swale and other swales and drainageways constructed as part of this project. Triangular silt dikes may be removed when all swales and runoff from the site is evaluated as stable.

### **5.2.5 Stabilized Construction Entrance**

The stabilized construction entrance will be maintained as long as trucks or other construction vehicles continue to travel on unpaved surfaces or vehicular tracking remains a problem.

### **5.2.6 Temporary Sediment Trap**

The most northerly temporary sediment trap from Phase I will remain in place through the Phase II activities until the entire front (north) side of the newly reconstructed Discovery Lodge is complete and the ground surface is stabilized. This sediment trap will be converted into the sedimentation pool for a bioretention basin after all upgradient contributing areas are stabilized.

## **6.0 GREEN INFRASTRUCTURE ENGINEERING AND ANALYSIS**

The following sections present a summary of the engineering data and calculations that have been made for the Stormwater Management Design at the Belleayre Mountain Discovery Lodge Site.

As an overview, the site layout was largely planned in 2007. As such, many of the planning requirements associated with the Green Infrastructure practices 5-step method were not included as part of the proposed site construction layout.

The site is completely underlain by NRCS Hydrologic Group C soils, which limits the effectiveness of attaining Runoff Reduction Volume (RRV) utilizing traditional Stormwater Management Practices (SMPs) as Source Reduction Green Infrastructure Practices. For standard water quality practices such as dry swales, and bio-retention, the calculated RRV represents only 20% and 40% of the total WQv treatment capacity for these practices. An exception to this is that several areas on the site have been identified as fill sites. Fill sites were allegedly created in the 1960s when Discovery Lodge and other infrastructure at Belleayre Mountain Ski Area were first constructed. In general, the soils in fill areas are well drained and compacted; however, they exhibit excellent infiltration capability which supports the construction of infiltration stormwater management practices.

The stormwater practices described herein have been selected based on maximizing their potential to provide RRV, as well as to take advantage of available space which will not impact the overall project programming. The Green Infrastructure practices have been placed and sized so that the critical programming elements developed over 4 years ago remain unchanged. The sum of the allowable reductions provided by the source reduction practices exceeded the minimum required RRV required under GP-0-10-001.

A map depicting the ecological attributes, grades, and soils of the contributing watershed surrounding Discovery Lodge is included as Figure 4.

## 6.1 EXISTING CONDITIONS

Drainage Area size: 7.49 acres

Soil Type: NRCS Hydrologic Group C throughout

Terrain: varies, from steep slopes to generally flat lawn areas around Discovery Lodge.

100% of the watershed ultimately drains to Crystal Brook via overland flow around the Discovery Lodge. The upper component to the south drains around Discovery Lodge to the east via man-made surface swales, then northerly to Crystal Brook. The lower component, around Discovery Lodge flows generally westerly and into the stream near the existing driveway culvert.

The point of analysis for the watershed was selected as a point adjacent to Crystal Brook where all of the drainage from the Discovery Lodge Watershed was assumed to have re-entered the brook.

Hydro Cad Modeling yields the following design flows at the watershed outlet:

### Existing Conditions, Discovery Lodge Drainage Area

24-hour Design Storm	Peak Runoff (CFS)	Runoff (AF)
1- year (3.5")	9.77	0.891
10-year (6")	24.28	2.15
100-year (8")	37.01	3.26

Currently, there are no detention or stormwater management practices working on the site. As such, this project will include completely new stormwater infrastructure placed in general conformance with the existing site design elements associated with the proposed project “Discovery Lodge at Belleayre Mountain Ski Center Rehabilitation & Addition” dated 2009.

Pertinent drainage area drawings, soils information, and the HydroCad Model for the Existing site are attached as **Appendix H**.

## **6.2 GREEN INFRASTRUCTURE PLANNING AND DESIGN PROCESS**

This design project has been designed in conformance with the dual regulatory guidance from the NYSDEC and the NYCDEP. Specifically, Green Infrastructure and the attainment of compliance under GP-10-0-001 were undertaken in conformance with NYSDEC Guidance. Further, in order to meet the full water quality goals for runoff generated by the 1-year design storm, compliance under NYCDEP regulations was required by implementing traditional “end of pipe” stormwater treatment methods.

Per the NYSDEC Design Manual, the site stormwater management planning has proceeded in conformance with what is commonly referred to as the five-step design process. This section presents a summary of the 5-step process, and includes an evaluation of all the green infrastructure planning measures as they apply to the site.

Under the five-step process, the following elements were considered in the development of the stormwater management design:

1. Plan the site development so that natural features are preserved, and impervious cover is minimized.
2. Calculation for Water Quality Volume (WQv), in conformance with the NYSDEC criteria, as well as the NYCDEP criteria for sites within the NYC Watershed Area.

3. Implementation of green infrastructure techniques and standard Stormwater Management Practices (SMPs) to maximize the Runoff Reduction Volume (RRV) capacity of the entire site.
4. Use standard SMPs to provide stormwater treatment for areas not addressed by SMPS with RRV capacity.
5. Design for volume and peak runoff rate control practices where required.

The appendices herein provide backup engineering information regarding all calculations and determinations made herein.

### **6.2.1 Site Planning**

The site redevelopment strategy has been set based on the programming requirements of the NYSDEC for their overall strategy for expanding the Discovery Lodge facility to accommodate nearly a doubling of skier usage. As such, site development features such as accessibility, health and sanitation, parking, food delivery, and trash removal require a substantial amount of planning and must be properly expanded to provide continuity of operations.

Nearly all of the site planning for this project took place in 2007, and well in advance of the Green Infrastructure requirements and GP-0-10-001. As such, most of the green infrastructure planning for Preservation of Natural Resources and Reduction of Impervious Cover was never considered in developing the overall stormwater management plan. Rather, the only real planning which took into consideration the ecologic setting of the project was performed in conformance with the Leadership in Energy and Environmental Design (LEED). Many of the site planning aspects discussed herein are specifically geared toward LEED site credits, and do not directly correlated to the current Green Infrastructure guidance.

Many of the existing site features, especially features such as roads, accessibility parking, and freight access to the expanded Discovery Lodge have generally been retained, however due to the nature of the expansion project on an existing structure, improvements to road sections,

sidewalks, and other site elements must be made based on NYS Building Codes, good engineering practices, and to meet Americans with Disabilities Act requirements.

**Planning Element No. 1: Preserve undisturbed, natural buffer and critical environmental areas**

In general, the existing Discovery Lodge Site is situated in an area which does not lend itself to the maintenance of adequate natural buffers to critical areas. In addition, due to the timing of the project planning, the retention of woodlands, and undisturbed areas, if any, around the base lodge was not considered while developing the approved site layout.

The most critical environmental area around the developed area is Crystal Brook, which is classified as a trout stream. With the exception of two large diameter culverts which will provide vehicle access to and from the site, all new development will take place outside of a 100' buffer away from the centerline of the brook. The installation details for the large diameter culverts have been approved by the NYSDEC Fish and Wildlife Unit.

**Planning Element No. 2: Employ open space, conservation, and clustering site design techniques**

The maximization of open space, and set aside of undeveloped land equal to the square footage of the new site improvements has been integrated into the project through the LEED v2.2 certification process. Specifically, LEED Sustainable Sites Credit SSc 5.2 – Maximize Open Space has been planned to provide vegetated open space equivalent to the building footprint, adjacent to the planned construction.

**Planning Element No. 3: Avoid Developing environmentally sensitive areas, including floodplain, steep slopes, habitat areas, ecosystems, on bedrock wetlands, shorelines, in areas of shallow groundwater, on impervious or unstable soils.**

The building site has been used as a ski resort base lodge since it was constructed in the 1960s and the site also contains associated parking lots and pedestrian walkways. No building construction in this project will take place within 100' of the existing Crystal Brook, and none of the site contains any other elements which may be considered environmentally sensitive. Although the installation of new culverts across Crystal Brook will require significant earthwork, full site restoration will prevent permanent impacts to this ecologic sensitive area.

**Planning Element No. 4: Minimize the creation of impervious surfaces, including building footprints, parking, roads, sidewalks and driveways.**

Every attempt was made to minimize the future building footprint, however programming elements for pedestrian circulation, and minimum occupancy largely impacted the proposed building footprint. Parking and roads are only slightly upsized relative to previous on site infrastructure in order to provide compliance with Americans with Disabilities Act (ADA) requirements, and for the minimum requirements for LEED Sustainable Site Credits for Public Transportation, Parking, and bicycle access (LEED Credits SSc 4.1, SSc 4.2, SSc 4.3 and SSc 4.4). The LEED requirements had little overall impact on the size and configuration of new site parking and roads; however improved vehicular access to the proposed site was mandatory to achieve the ADA goals.

**Planning Element No. 5: Minimize Clearing and grading**

The contract limit line for the proposed construction was tightly controlled as part of the project site planning process in conformance with LEED v2.2 requirements. Specifically, under LEED

Sustainable Sites Credit SSc5.1, the following goals were made with regards to the construction footprint: “limit all site disturbance to 40 feet beyond the building perimeter; 10 feet beyond surface walkways, patios, surface parking and utilities less than 12 inches in diameter; 15 feet beyond primary roadway curbs and main utility branch trenches; and 25 feet beyond constructed areas with permeable surfaces, such as pervious pavements, stormwater detention facilities and playing fields” that require additional staging areas in order to limit compaction in the constructed area.”

Although SSc 5.1 was not attained due to drainage grading, the goals remained in place for most of the site construction elements.

## **6.2.2 Calculate WQv**

The second step of the Green Design Process is to calculate the Water Quality Volume (WQv) for the developed project site. The following sections provide engineering data required to determine WQv for the site.

### **6.2.2.1 Proposed Conditions**

The proposed development of the site includes two (2) distinct construction phases. The first phase of the project includes performing all sitework and construction required to add a new wing to Discovery Lodge which will provide an expanded program space, a new ski rental shop, administrative offices, and improved circulation patterns. In addition, this phase will include the demolition and removal of the smaller ticket kiosk building, improved traffic flow patterns and parking, provisions for accessibility parking and pedestrian flow, and drainage and site layout improvements to the overall site. Phase I of this project includes the construction of a new service driveway to the north, along with a large diameter steel culvert. The new service

driveway will result in improved traffic flow patterns at the main entrance and will also enable preferred parking spaces to be situated in the main parking lot instead of near the main entrance.

Phase II of the project includes the partial demolition and reconstruction of the Discovery Lodge building and restoring the surrounding area. Combined, both phases of the proposed construction will disturb nearly 3.24 acres and create an increase of impervious area of 0.758 acres over the existing site conditions, for total impervious surfaces of 1.628 acres. Following all construction work, all site soils will be restored by deep tilling, in conformance with the Soil Restoration Best Management Practice. Soil Restoration is intended to restore the native hydrologic conditions of the site soils to that the impact of construction is minimized.

Prior to this project, NYSDEC forces will be making major changes to the site access roadway which will include a new large diameter culvert, new pedestrian bridge, and layout modifications to the existing main driveway surface. Construction of Phase I described herein is expected to begin in the Spring and has an estimated completion date of Fall of that same year. Phase II will take place the following year, from the conclusion of Phase I through the Fall of the following year.

It should be noted that although the total disturbed area will be approximately 3.24 acres, the natural drainage patterns associated with the post-construction condition will remain largely unchanged. The portion of the site that will be drained by the designed stormwater management system will include all pervious surfaces, and green areas that have been graded to change the direction of flow, or re-engineered to direct previously untreated discharges into the stormwater management in system.

The HydroCad Model presenting the hydrology for the developed site is included as **Appendix I** herein.

**WQv Calculation:  $WQ_v = P \times DA \times R_v/12$**

P (90<sup>th</sup> percentile Rainfall) = 1.3”

DA (drainage area) = 3.24 Ac

IA (Impervious Area) = 1.628 AF

$R_v = .05 + .009 (IA/DA)$

$R_v = .50$

**$WQ_v = 0.175 \text{ AF}$**

### **6.2.3 Apply Green Infrastructure Practices**

The third step in the design of Green Infrastructure involves applying Green Infrastructure Practices to the site to achieve total removal of the total WQv calculated for the site.

The Minimum Runoff Reduction Volume (RRv) for the site is calculated as:

**$\text{Minimum RR}_v = P \times .95 \times .30 \times IA/12 = 0.050 \text{ AF}$**

Where P = 1.3”, and IA = 1.628 acres

**\*\*\*Therefore, a WQv must be reduced by a minimum of 0.050 AF in order to meet the minimum requirements of GP-0-10-001**

For engineering purposes, the proposed 7.49 acre drainage area has been divided into generally 4 drainage sub-areas for the purpose of applying Green Infrastructure Practices.

The following presents a detailed description of drainage sub areas and how source reduction has been applied along with the associated RRv. Design calculations supporting each Source Reduction Practice are included in **Appendix G**.

1. **Upgradient Area to the South of Discovery Lodge:** This long and narrow drainage area is comprised of 4.25 acres of hilly terrain with little or no projected work to take place. The clean run-on from this upgradient area will be captured by a diversion swale, and routed toward the west through a level spreader, a wooded area, then ultimately to Crystal Brook.

Design Data:

- DA: 4.25 Acres (reduces effective downstream drainage area to 3.74 acres total)
  - This upland diversion swale discharges through a 20-lf level spreader in conformance with NYS Design Guidance for 10-year peak flow of 12.07 cfs.
  - The upland diversion swale is of sufficient capacity to handle the calculated 100-year design storm flow of 19.63 CFS.
2. **Area immediately South of Discovery Lodge:** Stormwater runoff in this area is made up of runoff from a large grass ski slope, a portion of the Discover Lodge Roof drainage, and drainage from a large patio on the south side of Belleayre Lodge. For storms greater than the 95<sup>th</sup> percentile rain, this 1.22 acre drainage area will be served by a Dry Swale SMP, which will discharge to the site stormwater management system.

The WQv treatment in this area is divided between stormwater planters adjacent to the proposed patio, with the remainder of the WQv being managed and treated in the Dry Swale SMP. .

**Stormwater Planters:** The contributing roof area and patio area combined total 16,865 square feet. Since stormwater planters are restricted to inflow from impervious areas of only 15,000 square feet, the contributing area was split in half with each half feeding a flow-through stormwater planter situated just to the south of the patio. Each stormwater planter was sized based on the following criteria:

### **Planters Adjacent to the Patio**

$A = .195$  acres (8,500 sf)(contributing area, each planter)

$AI = 0.195$  acres

$R_v = 0.950$

$WQ_v = 1.3 \times 0.195 \times 0.950/12 = 0.011$  AF

The amount of  $WQ_v$  treated in both planters = .022 AF and:

$RR_v$  (2 planters) =  $WQ_v = 0.022$ AF

**Dry Swale SMP Source Reduction Measure:** The remainder of the untreated runoff from the roof and slope areas on the south side of Discovery Lodge is directed to the Dry Swale for treatment. In addition, during larger storms, the stormwater planters by design, will overtop and also direct all stormwater discharges to the Dry Swale SMP.

The runoff from impervious surfaces which is captured and treated by the Dry Swale is limited to a 3,000 square foot (0.069 acre) area of roof (over ½ of the proposed addition) at Discovery Lodge. The  $WQ_v$  treated by the dry swale is calculated as follows:

$A = 0.825$  acres

$AI = 0.069$  acres

$R_v = 0.122$  therefore, use 0.20

$WQ_v = 1.3 \times 0.825 \times 0.2/12 = 0.018$  AF

$RR_v$  (dry swale) = 20% of  $WQ_v = 0.2 \times 0.018 = .004$  AF.

Therefore, the entire sub-area is treated by utilizing Green Infrastructure measures, and the combined  $RR_v$  for the area south of Discovery Lodge is:

**$RR_v = .022$ AF (planters) +  $0.004$ AF (dry swale) =  $0.026$  AF.**

Runoff exceeding the 10-year design storm will be diverted by stormwater pipelines to a centralized downstream treatment/detention facility. Treated water from the Dry Swale will be routed separately to a downstream treatment measure in order to attain secondary *in series* treatment pursuant to the NYCDEP Watershed Regulations.

3. **Area to the West of Discovery Lodge:** The primary driveway entrance and traffic turn-around for Belleayre lodge was completely re-designed in order to meet the required drainage management and stormwater treatment required by the GP-0-10-001. The drainage area in this location is comprised of 0.603-acres of hilly landscaped areas to the west of the new rental building, as well as the sidewalks and new roadways associated with the new site design. This area is projected to be 89% impervious. Water Quality source reduction in this area will be provided by constructing a bio-retention area in the center of the driveway loop.

Data:

- See Design for Bio-Retention in Appendix G
- DA = 0.603 ac
- AI = 0.522 ac
- R<sub>v</sub> = 0.829
- WQ<sub>v</sub> = 0.054 af
- RR<sub>v</sub> = 40% of WQ<sub>v</sub>, or
- **RR<sub>v</sub> = .4 x .054 = 0.022 AF**

4. **Area North of Discovery Lodge:** North of Discovery Lodge, all roof drainage, lawn drainage, and associated parking lot drainage will be directed to the north toward a steep embankment to a level grassy field below. The total area of this drainage area is 1.556 acres, with total impervious surfaces of 0.556 acres. In general, the overland flows in this area will mimic the current overland flow patterns, since very little will be changed

from the existing site conditions. In the northwest portion of this drainage area, storm sewers will capture runoff from the new roadway surfaces prior to entering Crystal Brook and direct that runoff to stormwater management practices for quality and quantity controls.

The component of this drainage area which discharges to the ground surface, thence into a forebay and a bioretention area to provide further WQv source treatment.

Data:

- See Design Package for Bio-Retention in Appendix G
- DA = 1.556ac
- AI = 0.556 ac
- Rv = .372
- WQv = .063 AF
- Allowable RRv = 40% of WQv:
- **RRv = .4 x 0.063 = 0.025 AF**

**Total RRv Achieved through Green Infrastructure Practices:**

**RRv Total = 0.026 (planters and dry swale) + .022 (bioretention west) + .025 (bioretention north) = 0.073 AF.**

Therefore, it may also be summarized that the RRv obtained exceeds the minimum calculated for the site; however, falls short of the overall WQv of 0.175 AF. The intent of applying Green Infrastructure Practices under GP-0-10-001 to all drainage areas on the site has been met with the existing design; however, the Green Infrastructure falls short of eliminating all of the WQv generated by the site. The following sections provide an evaluation of Green Infrastructure and substantiate that the maximum attainable RRv has been achieved.

- 5. Discussion of GI Alternatives:** Some additional RRv may have been attained if the planning for the project had considered the preservation of existing wooded and open space, a different approach for parking near the Discovery Lodge, and architectural changes, such as a green roof or rainwater cisterns as a flush water source into the overall architectural design. Due to the timing of the project planning in conjunction with the identified program requirements for the project, these additional Green Infrastructure are not considered feasible for implementation.

Further, since most of the project site is underlain by Hydrologic Classification C soils, infiltration practices, including infiltration trenches, drywells, and infiltration basins were not considered unless the underlying soil was confirmed by testing as fill. Due to the soil classification, the RRv for nearly all feasible Green Infrastructure practices was diminished to only a small percentage of the WQv treated by the practice; these practices included Bioretention (RRv = 40% of WQv) and Dry Swale (RRv = 20% of WQv). Due to the steep terrain associated with most of the project area, the Vegetated Swale SMP (RRv = 10% of WQv) was not considered as part of this project. In addition, porous pavement was not considered due to the NYSDEC Design Manual not recommending it for Class C and D soils.

- 6. NYCDEP Compliance:** Pursuant to stormwater management design within the NYC watershed, the runoff from the greater of the WQv or 1-year design storm must also be treated *in series utilizing separate SMPs*. (Series SMPs are not required for infiltration practices.) In order to comply with this requirement, all treated water from the dry swale, and both bioretention facilities as well as the end-of-pipe flow from the 1-year design storm will be managed with standard SMPs. The permanent SMP have been sized to accommodate the NYCDEP requirements are discussed in detail in the following sections.

#### **6.2.4 Permanent SMP for Water Quality Control**

The fourth step of engineering design of Green Infrastructure Practices is to provide additional treatment to treat the remaining WQv that has not already been addressed at the source. For this project, the runoff in all drainage areas has been treated in conformance with Green Infrastructure requirements. However, since  $RRv < WQv$ , a portion of the site runoff remains in the system to be discharged and treated by a traditional end-of-pipe stormwater management system.

For this project, the remainder of the Stormwater Management design will focus on providing secondary treatment for effluent from the upstream Green Infrastructure practices, as well as the total discharge from the 1-year design storm, or Channel Protection Volume, (CPv) as called for in the NYCDEP Watershed regulations.

Infiltration testing was conducted throughout the Discovery Lodge parcel in December, 2010. This testing resulted in unexpectedly high infiltration rates in the areas north and west of the Discovery Lodge site. Specifically, an infiltration rate of 34" per hour was measured in soil materials at a location northeast of Discovery Lodge, near the proposed final SMP. This high infiltration rate confirms that this area likely received fill during the construction of Discovery Lodge in the 1960s and suggests that infiltration is a viable option for this site, despite being classified as having Hydrologic Soil Class C soils. Infiltration of the final runoff from the SMPs also meets the requirements of the NYCDEP for secondary treatment of WQv and the runoff associated with the one year design storm. Therefore, at Discovery Lodge, the final downstream SMP selected for the site is an infiltration SMP, which has been sized to contain and infiltrate the entire CPv plus the treated water discharges from the Green Infrastructure practices.

The combined CPv and previously treated discharge from the site are calculated as:

0.194 AF (previously treated water from all Green Infrastructure) + 0.574 AF (CPv) = 0.768 AF to be infiltrated through an infiltration SMP.

**Stilling Basin:** A stilling basin will be situated upstream of the infiltration basin. The purpose of the stilling basin is to provide gross settlement of suspended sediments before the water discharges to the infiltration basin. The capacity of the basin is 4,300 CF, and it is designed to overflow via a stabilized weir outlet to the infiltration basin. The capacity of the stilling basin detains approximately 36 percent of the Cpv (1-year storm runoff).

**Infiltration Basin:** An Infiltration Basin has been designed with a capacity of 14,300 CF at the overflow elevation and effectively detains and infiltrates stormwater discharges up to the 50-year design storm. The infiltration basin's overflow is comprised of a 30" riser pipe and culvert, which regulates storms up to and including the 100-year design storm.

### 6.2.5 Permanent SMPs to Detain Peak Flows

As described in the preceding section, the infiltration practice selected for the site has the capacity to effectively infiltrate all stormwater flows up through the 50 year design storm. The capacity of the infiltration basin allows for the satisfactory detention of all storms through the 100-year design storm so that the discharges to Crystal Brook do not exceed the pre-construction conditions. The 100-year storm is contained within the infiltration practice, and the controlled discharge from this storm event is managed by a 30' discharge pipe flowing to a stabilized outlet at Crystal Brook.

### Pre- and Post-Construction Peak Runoff Calculations

24-hour Design Storm (total precip.)	Existing Peak Runoff (CFS) Note 1	Proposed Site Peak Runoff (CFS) Note 1	Detention Provided (CF) Note 2
1- year (3.5")	9.77 (0.891 AF)	4.12 (0.391 AF)	37
10-year (6")	24.28	12.15	7,543
100-year (8")	37.01	21.76	12,425

Note 1: Peak Runoff determined at Site Design Point in Crystal Brook.

Note 2: Detention provided at upstream Infiltration/Detention Basin

## **7.0 POLLUTION PREVENTION MEASURES AND BEST MANAGEMENT PRACTICES**

As standard protocol, all construction activities will take place on the site with the goal to minimize the release of chemicals, petroleum, construction debris, and waste on the site. At a minimum, all construction debris and waste will be collected and containerized at the end of each work day, with a complete site cleanup taking place at the end of each week. Further, in conformance with the LEED™ aspects of this project, ongoing segregation, recycling, and disposal of construction debris is required by this contract.

The Construction Contractor for the project will be responsible to coordinate with other Contractors to provide adequate disposal containers for the project waste. Disposal containers should consist of dumpsters, roll offs, or other properly sized containers. Segregation and recycling of paper, cardboard, metals, and other recyclable debris is mandatory.

Containers utilized for general refuse shall be covered with a waterproof lid to prevent stormwater from entering the container. Petroleum bulk storage tanks brought to the site shall meet the minimum secondary containment and spill containment requirements of NYSDEC, National Fire Protection Administration (NFPA), and Underwriters Laboratories (UL).

Appendix J presents Best Management Practices (BMP) to be implemented at the construction site to prevent pollution from entering the on-site stormwater system. The BMPs present the purpose, practices, and execution instructions for each potential threat to stormwater quality during construction. These BMPs include the following:

- Sediment and Erosion Control.
- Construction Waste Management.
- Liquid Waste Management.

- Maintaining Storm Drains.
- Spill Response and Prevention.
- Materials Storage.
- Runoff Control by Minimizing Clearing.
- Stabilize Drainage Ways.
- Water Conservation.
- Manage Stockpiled Materials.
- Street Sweeping.
- Vehicle and Equipment Cleaning.
- Vehicle Maintenance and Fueling.
- Residual Concrete and Pavement Disposal.
- Liquid Waste Management.
- Pesticide, Fertilizer, and Detergent Management.
- Soil Restoration Following Construction

## **7.1 INSPECTIONS AND MAINTENANCE – TEMPORARY MEASURE**

The Owner or Operator of this project must ensure that all erosion and sediment control practices identified in this SWPPP are maintained in effective operating condition at all times.

Inspections must be completed in accordance with the requirements of the most current version of the technical standard, New York Standards for Erosion and Sediment Control.

Inspections may be suspended for construction sites where soil disturbance activities have been temporarily halted, such as winter shutdown, once temporary stabilization measures have been applied to all disturbed areas. Inspections must resume once soil disturbing activities begin.

For construction sites where soil disturbance activities have been shut down with partial project completion, inspections may stop if all disturbed areas as of the project shutdown date have achieved final stabilization, and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

An Owner or Operator of the following construction activities shall have a qualified inspector conduct site inspections in conformance with the requirements presented in GP-0-10-001. Unless otherwise notified by the Department, the Owner or Operator shall have a qualified inspector conduct site inspections in accordance with the following timetable:

- For construction sites where soil disturbance activities are ongoing, the qualified inspector shall conduct a site inspection at least twice every seven calendar days.
- For construction sites where soil disturbance activities have been temporarily suspended (e.g., winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the qualified inspector shall conduct a site inspection at least once every 30 calendar days. The Owner or Operator shall notify the Regional Office stormwater contact person in writing prior to reducing the frequency of inspections.
- For construction sites where soil disturbance activities have been shut down with partial project completion, the qualified inspector can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization, and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The Owner or Operator shall notify the Regional Office stormwater contact person in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the Owner or Operator shall have the qualified inspector(s) perform a final inspection and certify that all disturbed areas have achieved final stabilization, and all temporary, structural erosion, and sediment control measures have been removed; and

that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the “Final Stabilization” and “Post-Construction Stormwater Management Practice” certification statements on the Notice of Termination (NOT). The Owner or Operator shall then submit the completed NOT form to the NYSDEC.

At a minimum, the qualified inspector shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved final stabilization, and all points of discharge from the construction site.

The qualified inspector shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

- Date and time of inspection.
- Name and title of person(s) performing inspection.
- A description of the weather and soil conditions (e.g., dry, wet, saturated) at the time of the inspection.
- A description of the condition of the run-off at all points of discharge from the construction site. This shall include identification of any discharges of sediment from the construction site. Include discharges from conveyance systems (i.e., pipes, culverts, ditches, etc.) and overland flow.
- Identification of all erosion and sediment control practices that need repair or maintenance.
- Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced.

- Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection.
- Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards.
- Corrective action(s) that must be taken to install, repair, replace, or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).
- Digital photographs with a date stamp that clearly shows all practices requiring corrective action.

Within 1 business day of the completion of an inspection, the qualified inspector shall notify the Owner or Operator and appropriate Contractor (or subcontractor) of any corrective actions that need to be taken. The Contractor (or subcontractor) shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

All inspection reports shall be signed by the qualified inspector. A copy of the construction site log book and inspection reports presented in the New York Standards and Specifications for Erosion and Sediment Control is provided as Appendix K.

Temporary sediment and erosion control measures should be periodically inspected throughout the duration of construction until the site is completely stabilized with grass. All Contractors on the site that conduct earthwork or conduct activities that may result in disturbed earth shall provide at least one trained individual at all times. The trained individual shall provide full time inspection and maintenance of installed sediment and erosion control measures at the site.

Silt fence, check dams, and silt fence inlet protection with sediment built up to one-half of the total height shall be cleaned and the sediment disposed at a suitable spoils site approved by the Owner.

## 7.2 MAINTENANCE – PERMANENT MEASURES

Maintenance of this permanent stormwater management practice must adhere to the regulations included in the Stormwater Management Design Manual as follows:

*“A legally binding and enforceable maintenance agreement shall be executed between the facility owner and the local review authority to ensure the following:”*

*“Silt/sediment shall be removed from the filter bed when the accumulation exceeds one inch. When the filtering capacity of the filter diminishes substantially (i.e., when water ponds on the surface of the filter bed for more than 48 hours), the top few inches of discolored material shall be removed and shall be replaced with fresh material. The removed sediments shall be disposed in an acceptable manner (i.e., landfill).”*

Other routine maintenance procedures that should be utilized in the sedimentation/stilling basin, bio-retention area, infiltration basin, weirs, and swales include the following:

- Maintain the site free from trash and other accumulations of debris that could slow the exfiltration of stormwater through the infiltration basin, dry swale, or bioretention areas.
- Provide routine mowing in the dry swale, stilling basin, infiltration basin, and in the grass filter strips around the bio-retention areas to limit the growth of tall grasses, brushy vegetation, and trees in the organic filter and within the berms and weirs.
- At least semi-annually, rake and remove leaves, trash, and accumulated organic matter from within the bioretention areas and infiltration basin.

- Visually inspect and clear any blockages from all pipe and overflow structures that discharge stormwater from the forebay, sand filter and detention pond areas.

### **7.3 REVIEW OF SWPPP**

This document is the official record of compliance with the NYSDEC requirements for stormwater management. This SWPPP and all inspection records must be maintained at the site and must be made available for review by the NYSDEC or Town inspectors, or any other agency having jurisdiction upon request.

### **7.4 MONITORING, REPORTING, AND RETENTION OF RECORDS**

In conformance with the requirements of General Permit GP-0-10-001, the Owner is required to maintain records required by this SWPPP and to report permit compliance to NYSDEC on a periodic basis. Copies of monitoring and reporting forms required by NYSDEC are included in Appendix K herein.

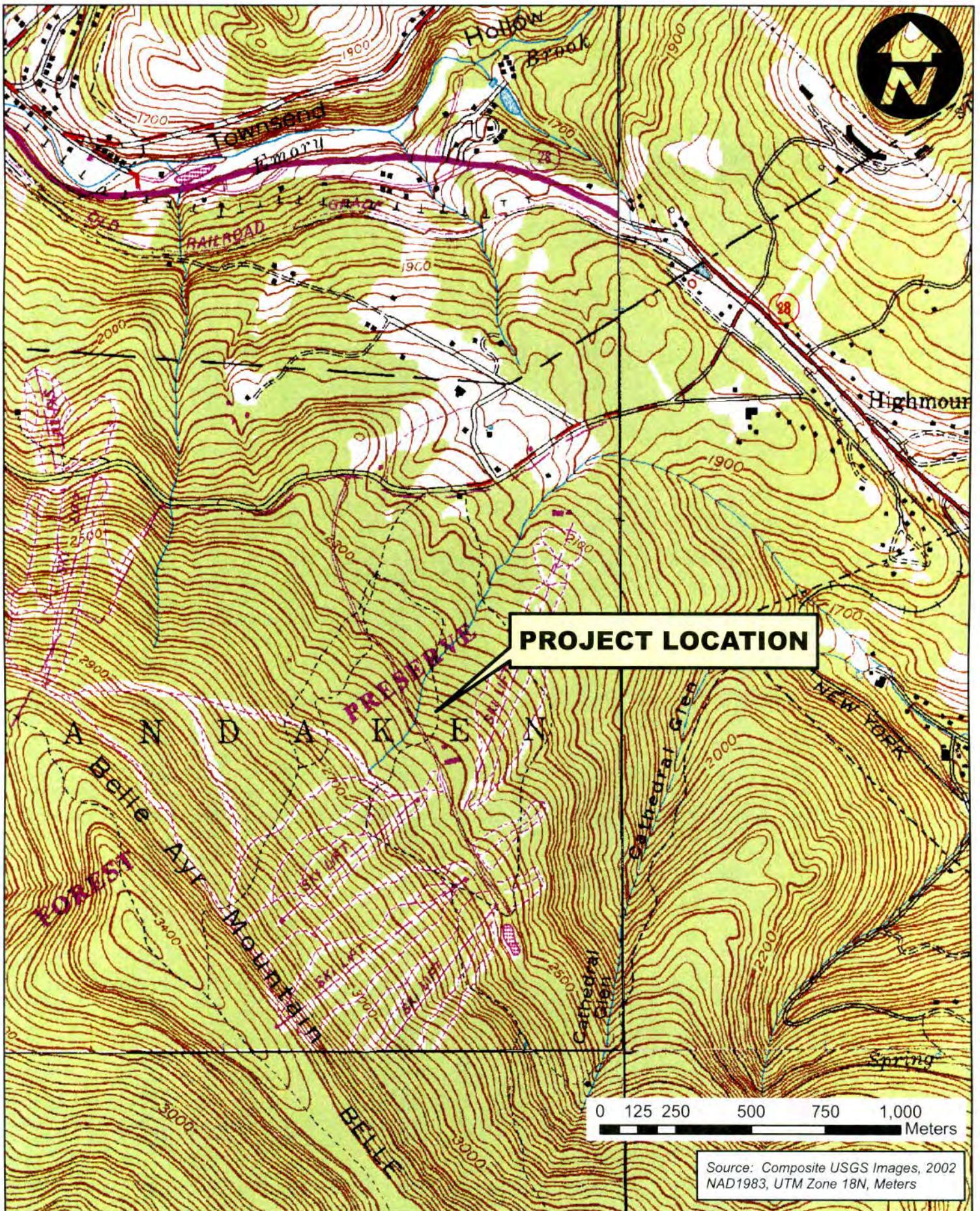
Specific requirement for monitoring and reporting include, but may not be limited to, the following:

- The Owner shall retain the SWPPP and all associated inspection forms, reports, and other records for a period of at least 5 years following final stabilization of the site.
- This SWPPP shall be maintained on the site from the initiation of construction activities to the final stabilization of the site. It shall be readily available for inspection or review by NYSDEC, other regulatory authority, or any individual making a written request.
- Periodic reports (monthly and quarterly reports) shall be completed and certified by the Owner. All reports shall be posted or maintained on site for ready review.

**FIGURE 1**

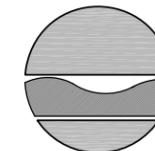
**SITE LOCATION MAP**

F-1



**FIGURE 2**

**LIMITS OF DISTURBANCE**



DEPARTMENT OF ENVIRONMENTAL CONSERVATION

CONSULTANT



Consulting Engineering & Land Surveying, P.C.  
430 Court St., Ulster, New York Office  
Telephone (315) 724-0100/ Fax (315) 724-3715

WARNING:

THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.

CONTRACT:

CONSTRUCTION

TITLE:

DISCOVERY LODGE AT BELLEAYRE MOUNTAIN SKI CENTER REHABILITATION & ADDITION

LOCATION:

BELLEAYRE MOUNTAIN  
PO BOX 313  
HIGHMOUNT, NY 12441

CLIENT:

D.E.C.  
(518) 402-9084

REVISED  
STORMWATER  
MANAGEMENT PLANS  
2-7-11

MARK	DATE	DESCRIPTION
PROJECT NUMBER:	03-2118	
DESIGNED BY:	TMK	
DRAWN BY:	SRR	
FIELD CHECK:		
APPROVED:	WCN	
SHEET TITLE:		

GRADING PLAN

DRAWING NUMBER:

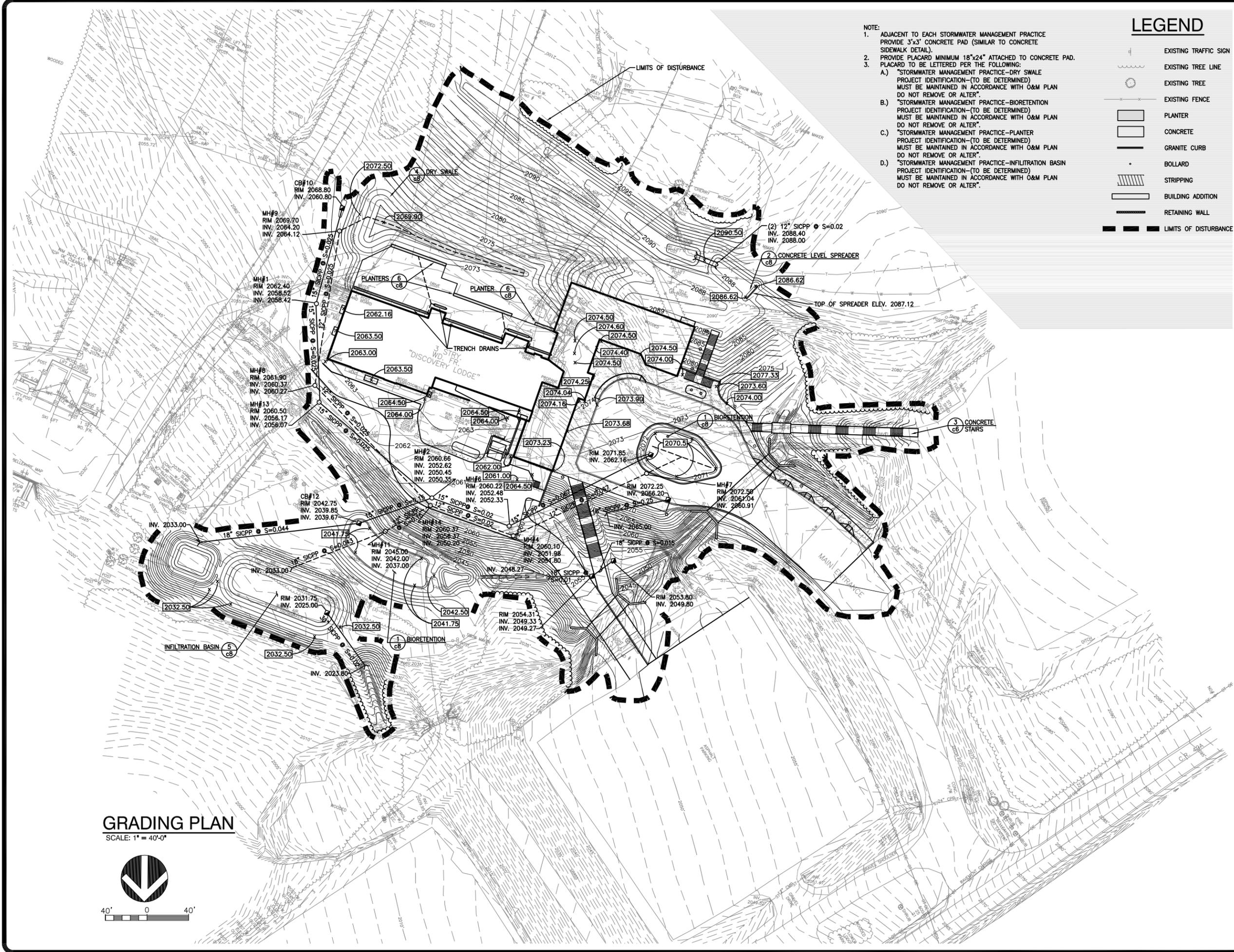
C-3

SHEET OF

### LEGEND

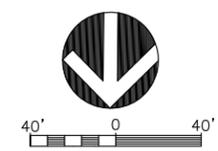
- EXISTING TRAFFIC SIGN
- EXISTING TREE LINE
- EXISTING TREE
- EXISTING FENCE
- PLANTER
- CONCRETE
- GRANITE CURB
- BOLLARD
- STRIPPING
- BUILDING ADDITION
- RETAINING WALL
- LIMITS OF DISTURBANCE

- NOTE:
- ADJACENT TO EACH STORMWATER MANAGEMENT PRACTICE PROVIDE 3'x3' CONCRETE PAD (SIMILAR TO CONCRETE SIDEWALK DETAIL).
  - PROVIDE PLACARD MINIMUM 18"x24" ATTACHED TO CONCRETE PAD. PLACARD TO BE LETTERED PER THE FOLLOWING:
    - "STORMWATER MANAGEMENT PRACTICE-DRY SWALE PROJECT IDENTIFICATION-(TO BE DETERMINED) MUST BE MAINTAINED IN ACCORDANCE WITH O&M PLAN DO NOT REMOVE OR ALTER"
    - "STORMWATER MANAGEMENT PRACTICE-BIORETENTION PROJECT IDENTIFICATION-(TO BE DETERMINED) MUST BE MAINTAINED IN ACCORDANCE WITH O&M PLAN DO NOT REMOVE OR ALTER"
    - "STORMWATER MANAGEMENT PRACTICE-PLANTER PROJECT IDENTIFICATION-(TO BE DETERMINED) MUST BE MAINTAINED IN ACCORDANCE WITH O&M PLAN DO NOT REMOVE OR ALTER"
    - "STORMWATER MANAGEMENT PRACTICE-INFILTRATION BASIN PROJECT IDENTIFICATION-(TO BE DETERMINED) MUST BE MAINTAINED IN ACCORDANCE WITH O&M PLAN DO NOT REMOVE OR ALTER"



### GRADING PLAN

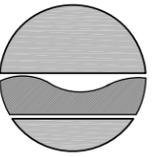
SCALE: 1" = 40'-0"



Feb. 07.2011 2:13pm  
V:\2008\0312400 Belleayre Ski Area\CAD\Design\Redesign of stormwater-2010\061240-grading.dwg  
36x24 PLOT SHEET

**FIGURE 3**

**PROJECT PHASING PLAN**



DEPARTMENT OF ENVIRONMENTAL CONSERVATION

CONSULTANT

**SHUMAKER**  
Consulting Engineering & Land Surveying, P.C.  
430 Court St., Ulica, New York Office  
Telephone (315) 724-0100/ Fax (315) 724-3715

**WARNING:**

THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.

**CONTRACT:**

CONSTRUCTION

**TITLE:**  
DISCOVERY LODGE AT BELLEAYRE MOUNTAIN SKI CENTER REHABILITATION & ADDITION

**LOCATION:**  
BELLEAYRE MOUNTAIN  
PO BOX 313  
HIGHMOUNT, NY 12441

**CLIENT:**  
D.E.C.  
(518) 402-9084

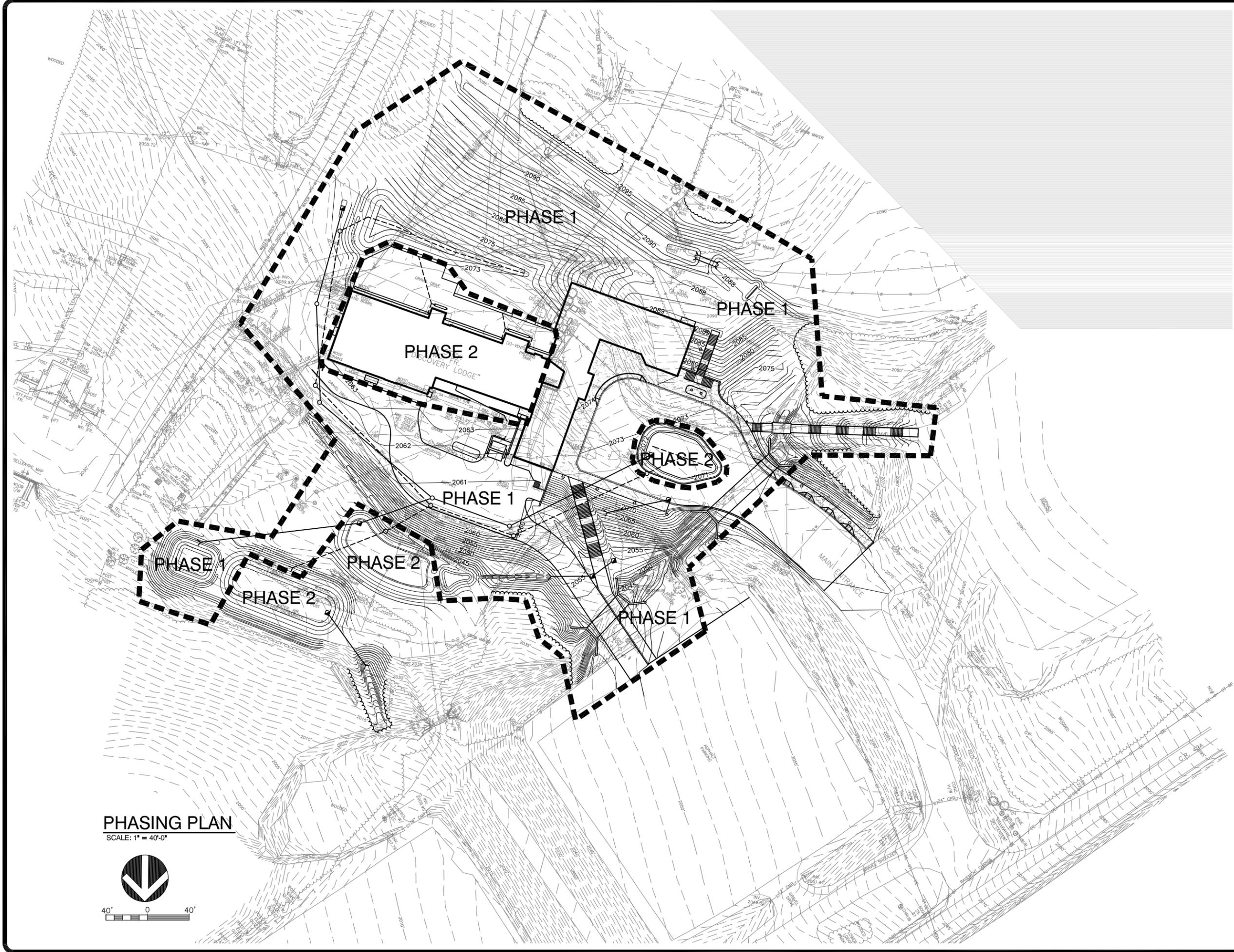
**REVISED**  
STORMWATER MANAGEMENT PLANS  
2-7-11

MARK	DATE	DESCRIPTION
PROJECT NUMBER:	03-2118	
DESIGNED BY:	TMK	
DRAWN BY:	SRR	
FIELD CHECK:		
APPROVED:	WCN	
SHEET TITLE:		

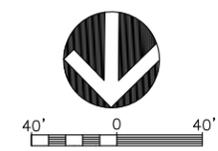
PHASING PLAN

DRAWING NUMBER:  
FIGURE - 3

SHEET OF



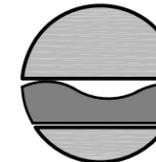
**PHASING PLAN**  
SCALE: 1" = 40'-0"



Feb. 07.2011 - 2:47pm  
V:\2008\061724.00 Belleayre Ski Area\CAD\Design\stormwater-2010\06124C phasing 2 7 2011.dwg  
36x24 PLOT SHEET

**FIGURE 4**

**DISCOVERY LODGE WATERSHED MAP**



DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 4  
SRR Drawn By: TMK  
Checked By: WCN  
Project Mgr: 2/7/11  
Date: 03-21-18  
Project No: 03-2118

### LEGEND

SOIL TYPE - "C" 

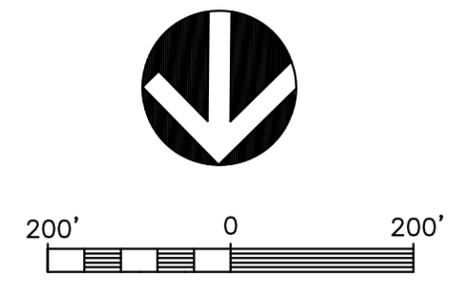
WATERSHED BOUNDARY

100' BUFFER FOR CRYSTAL BROOK CONSTRUCTION

CRYSTAL BROOK (TROUT STREAM)

PROPOSED LAYOUT  
DISCOVERY LODGE

SANITARY  
PUMP  
CHAMBER



DRAWING TITLE  
DISCOVERY LODGE  
WATERSHED CONDITIONS

DISCOVERY LODGE AT BELLEYSRE  
MOUNTAIN SKI CENTER  
REHABILITATION & ADDITION  
HIGHMOUNT  
ULSTER

