

4.0 ENVIRONMENTAL IMPACT ANALYSIS

H. HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section evaluates potential hydrology and water quality impacts to surface water resources within the Project Area that could occur with implementation of the TSMP. The section incorporates technical information from the *Hydrology and Water Quality Report* (March 2011) for the Project prepared by Triad-Holmes Engineering. This report is provided for reference in Appendix G of this Draft EIR.

1. ENVIRONMENTAL SETTING

a. Regulatory Framework

Water quality is regulated at the Federal, State, and local levels. The United States Environmental Protection Agency (USEPA), the United States Forest Service (USFS), the State Water Resources Control Board (SWRCB), the Lahontan Regional Water Quality Control Board (LRWQCB), and the Town of Mammoth Lakes regulate water quality in the Project Area.

(1) Federal Level

(a) Clean Water Act

The U.S. Army Corps of Engineers (USACE) regulates “discharge of dredged or fill material” into “waters of the U.S.,” which includes tidal waters, interstate waters, and all other waters that are part of a tributary system to interstate waters or to navigable “waters of the U.S.,” as well as the use, degradation, or destruction of which could affect interstate or foreign commerce or which are tributaries to waters subject to the ebb and flow of the tide (33 C.F.R. 328.3(a)), pursuant to provisions of Section 404 of the Federal Clean Water Act (CWA). The USACE generally takes jurisdiction within rivers and streams to the “ordinary high water mark” determined by erosion, the deposition of vegetation or debris, and changes in vegetation. The USACE defines jurisdictional wetlands as areas that contain hydrophytic vegetation (i.e., aquatic vegetation), hydric soils (i.e., soils that are sufficiently wet in the upper part to produce anaerobic conditions), and wetland hydrology, in accordance with the procedures established in the USACE Wetland Delineation Manual.¹ On January 9, 2001, the United States Supreme Court ruling in the Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers (No. 99-1178) held that the CWA does not give the federal government regulatory authority over non-navigable, isolated, intrastate waters. As a result of this decision, some previously regulated depressional areas, such as mudflats, sandflats, wetlands, prairie potholes, wet meadows, playa lakes, natural ponds, and vernal pools, which are not hydrologically connected

¹ U.S. Army Environmental Laboratory, *Wetlands Delineation Manual*, 1987 Edition.

to other intrastate or interstate “waters of the U.S.,” are no longer regulated by the USACE.² Potential impacts to designated “waters of the U.S.” are discussed in subsection 4.C, *Biological Resources*, of this EIR.

Section 401 of the CWA requires that any applicant for a federal permit that involves activities resulting in a discharge to “waters of the U.S.” shall provide a certification from the State in which the discharge is proposed. The State certification needs to conclude that the discharge will comply with the applicable provisions under the federal CWA. Therefore, before the USACE will issue a Section 404 permit, applicants must apply for and receive a CWA Section 401 Water Quality Certification. In the State of California, the overall regulation, protection, and administration of water quality is carried out by the State Water Resources Control Board (SWRCB).

The SWRCB and the LRWQCB enforce State of California statutes, equivalent to or more stringent than the federal statutes. The LRWQCB is responsible for establishing water quality standards and objectives that protect the beneficial uses of various waters in their region. The LRWQCB is also responsible for protecting surface and ground waters from both point and non-point sources of pollution.

Section 402(p) of the CWA mandates that municipal permits must effectively prohibit the discharges of non-stormwater to the stormwater system except under certain provisions, and requires controls to reduce pollutants in discharges from the stormwater system to the maximum extent practicable, including the use of Best Management Practices (BMPs), control techniques, and system, design, and engineering methods.³

Under Subsection 303(d) of the Clean Water Act, states, territories and authorized tribes are required to develop a list of water quality limited segments. These waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The Clean Water Act requires that these jurisdictions establish priority rankings for water on the lists and develop action plans, called as Total Maximum Daily Loads (TMDL), to improve water quality. Although it has been determined that the sources of pollution in Mammoth Creek are naturally occurring and not man-made, California’s 303d list includes Mammoth Creek, as discussed further below.

With regard to implementation of the federal Clean Water Act within USFS lands, the USFS Pacific Southwest Region developed comprehensive water quality BMPs for projects occurring within USFS jurisdiction in California. These BMPs are enumerated in the guidance document entitled *Water Quality Management for Forest System Lands in California Best Management Practices* (September 2000). This document represents a portion of the State of California’s Nonpoint Source Management Plan. The practices, procedures, and program are in conformance with, and comply with the provisions and requirements of Sections 208 and 319 of the federal Clean Water Act (PL 92-500) and the USEPA guidance for the Coastal Zone Act Reauthorization Amendment. They are also within the guidelines of the SWRCB Basin Plans (see discussion below under State Level) developed by the nine RWQCBs in the State. Pursuant to Section 208 of the Clean Water Act, all agencies responsible for carrying out any portion of a State Water Quality Management Plan must be designated as a Water Quality Management Agency (WQMA). Through the execution of a formal

² These areas may still be regulated by CDFG under Fish and Game Code Section 1600 or by the RWQCB under the Porter-Cologne Act. Legislation has been introduced to the State Assembly to revise the Fish and Game Code to specifically regulate isolated waters affected by the SWANCC case.

³ State Water Resources Control Board Fact Sheet for Water Quality Order 99-08-DWQ.

Management Agency Agreement (MAA) with the USFS in 1981, the SWRCB designated the USFS as the WQMA for National Forest Service (NFS) lands in California. It is through the proper installation, operation, and maintenance of these State certified and USEPA approved BMPs that the USFS will meet its obligations for compliance with water quality standards and fulfill its obligation as a designated WQMA.

More recently, in May 2011, the USFS released a draft water quality guidance handbook for NFS lands in California that furthers the guidance provided in the 2000 BMP guidance document discussed above. The latest document, the draft *Water Quality Management Handbook*, describes background, legal, and policy basis for the handbook (Chapter 1); BMPs that will be used for controlling nonpoint source pollution (Chapter 2); processes for implementing those BMPs (Chapter 3); an adaptive management system to continually improve BMPs (Chapter 4); restoration of legacy water-quality problems (Chapter 5), a monitoring plan to evaluate the success of the handbook (Chapter 6); specific measures for total maximum daily load (TMDL) implementation (Chapter 7); and needed future actions (Chapter 8). USFS will use these BMPs and processes to comply with provisions of:

- 1) Federal water-quality statutes and regulations, including the Clean Water Act, the Coastal Zone Act Reauthorization Amendments, and the related regulations of the EPA.
- 2) California's water-quality requirements, including the Porter-Cologne Water Quality Control Act; the five elements of implementation and enforcement for the SWRCB Non-point Source Pollution Control Policy; the Basin Plans of the RWQCBs; and water-quality control regulations, plans, policies, and program plans approved by the SWRCB pursuant to the foregoing federal and State statutes.

The provisions of the Water Quality Management Handbook are designed to conform and comply with all of these legal requirements, as well as with applicable USFS directives.

The objectives of this *Water Quality Management Handbook* are:

- 1) To ensure that the quality and beneficial uses of water are maintained where they are in good condition, consistent with the Federal and State anti-degradation/non-degradation policies, and the principles of conservation biology.
- 2) To protect the quality and beneficial uses of water from further degradation in water bodies that are trending toward impairment, as defined by Clean Water Act Section 303 (d).
- 3) To make substantial progress toward eventual delisting of water body segments listed pursuant to Clean Water Act Section 303(d).
- 4) To remediate legacy sources of pollution.
- 5) To ensure compliance with Federal and State water-quality objectives and legal requirements in the most efficient manner.

- 6) To enhance USFS performance as a water quality management agency, and increase and improve its responsibility, transparency and accountability in its relationships with the Water Boards and the public.

Section 313 of the Clean Water Act states that the federal government is subject to and will comply with all federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution in the same manner, and to the same extent as any nongovernmental entity. This means the USFS must use nonpoint source controls, including BMPs, approved by the State.

Several different relationships occur throughout the United States regarding State-specific BMPs and NFS lands. States usually have their own sets of BMPs, and when they do, the USFS adheres to them. A second situation occurs when the USFS has authored the BMPs and a state has agreed that those practices conform to state requirements. The use of USFS-authored BMPs is usually formalized through a memorandum of understanding. The third situation occurs when USFS-authored BMPs have gone through a formal public review process, been approved by the state and/or EPA, and the governor of the state has designated the USFS as the water-quality management agency for NFS lands within the state. In California, the State is the final authority on adequacy of BMPs.

(b) National Pollution Discharge Elimination System

The USEPA established the National Pollutant Discharge Elimination System (NPDES) Program as the primary implementation program for regulating surface water quality. The NPDES Program requires permits for storm water discharge from storm drain systems into “waters of the U.S.” The NPDES Program addresses storm water discharge during both pre- and post-construction activities. In California, the NPDES program is administered by the SWRCB, described below.

Construction activities disturbing one acre or more are required to comply with the SWRCB General Construction Activity Storm Water Permit, which requires the preparation and approval of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must include the implementation of BMPs that would reduce the potential for discharge of accidental and/or implicit pollutants into the storm drain system during grading and construction. The BMPs should be designed to maintain construction areas in such a condition that storm flows do not carry wastes or pollutants off-site. The General Construction Activity Storm Water Permit requires that these BMPs be in place prior to issuance of a grading permit.

Under the General Construction Activity Storm Water permit, project applicants are also required to implement a Standard Urban Storm Water Mitigation Plan (SUSMP) during the operational life of a project to ensure that storm water pollution is addressed through the incorporation of BMPs in the design of the development. This requirement provides numerical water quality design standards to ensure that storm water runoff is managed for water quality concerns in addition to flood protection. Project applicants are required to select source control and treatment control BMPs from the list approved by the RWQCB. In combination, the treatment control BMPs must be sufficiently designed and constructed to treat, infiltrate, or filter the first $\frac{3}{4}$ -inch of storm water runoff from a storm event.

(2) State Level

(a) State Water Resources Control Board

The Clean Water Act authorizes the USEPA to allow the State of California to serve as the NPDES permitting authority in lieu of the USEPA. The Porter-Cologne Water Quality Control Act authorizes the SWRCB to set statewide policy for the implementation of state and federal laws and regulations, through nine Regional Water Quality Control Boards (RWQCBs) which regulate and control the discharge of pollutants into waters of the State.

The SWRCB enforces State of California statutes, equivalent to or more stringent than the federal statutes and is responsible for establishing water quality standards and objectives that protect the beneficial uses of various waters in their region. The SWRCB is also responsible for protecting surface and ground waters from both point and non-point sources of pollution.

As discussed above, the CWA allows the SWRCB to implement federal clean water regulations, which are, in turn, implemented and enforced through nine regional water boards. Enforcement procedures include mandatory stormwater management, wastewater treatment, water quality monitoring, wetlands protection, ocean protection, environmental education, environmental justice, contaminated sites cleanup, and low-impact development. Where water quality issues cross boundaries between different regional divisions, or have significant statewide application, the SWRCB may develop water quality control plans and policies, including standards, and general permits. The SWRCB also approves regional basin plans, reviews petitions of RWQCB actions, administers financial assistance programs (such as for water pollution control or cleanup), addresses enforcement, and provides administrative and other functions that support the Water Boards. The SWRCB is also responsible for allocating water rights and adjudicating water right disputes.

The SWRCB developed the *2008-2012 Strategic Plan* with the mission to preserve, enhance, and restore the quality of California's water resources. Implementation actions include the development of a standard total maximum daily load (TMDL) plan format that considers pollutant or TMDL groupings, and addresses impairment pollutants in priority watersheds. Where appropriate, the SWRCB considers possible amendment of water right permits where pollutant source control measures and a water body's capacity to receive pollutants is insufficient to meet water quality standards. The SWRCB also works with the CDFG and others to list priority streams and to develop minimum stream flow objectives. For priority streams where minimum flow objectives are not being met, the SWRCB mandates actions to protect the public trust.

(b) California Department of Fish and Game Code

Section 1602 of the California Fish and Game Code requires any entity (e.g., person, State or local government agency, or public utility) who proposes a project that will substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, it must first notify the California Department of Fish and Game (CDFG) of the proposed project. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support, or have supported, riparian vegetation. The CDFG's jurisdiction extends to the river, stream, or lake top-of-bank, or to the outer edge of the adjacent riparian vegetation (i.e. riparian "drip line"). If the CDFG determines that a proposed project may

substantially adversely affect existing resources, a Lake or Streambed Alteration Agreement (Section 1602 Permit) will be required. If an agreement is required, DFG may conduct an on-site inspection and submit a draft agreement to the applicant. The draft agreement includes measures to protect fish and wildlife resources during the conduct of a project.

(3) Regional and Local Level

(a) Regional Water Quality Control Boards

Regional Water Boards serve as the frontline for State and federal water pollution control efforts. Each Regional Water Board conducts activities and makes water quality decisions for the protection of the waters within its region. These activities include developing water quality control plans (basin plans) for their watersheds that establish water quality standards and strategies, issuing waste discharge requirements (permits) based on the basin plans and State Water Board plans and policies, monitoring water quality, determining compliance with requirements, and taking enforcement actions.

Under the Porter-Cologne Act, a RWQCB may choose to regulate discharges of waste (dredge or fill materials) by issuing Waste Discharge Requirements (WDR), a type of state discharge permit, instead of issuing a CWA Section 401 Water Quality Certification. The SWRCB must review the WDR and certify, condition, or deny any activity if it does not comply with state water quality standards. Each RWQCB may waive WDRs for a specific discharge or category of discharges as long as the conditions stated in the respective RWQCB's Water Quality Management Plan are followed. Processing of a WDR is similar to that of a Section 401 certification; however, the RWQCB has slightly more discretion to add conditions to a project under the Porter-Cologne Act than under the CWA.

(b) Lahontan Regional Water Quality Control Board

The Project Area is within the jurisdictional boundaries of the LRWQCB, which includes all of California east of the Sierra Nevada crest. The LRWQCB is responsible for establishing water quality standards and objectives that protect the beneficial uses of various waters in their region and for protecting surface and ground waters from both point and non-point sources of pollution. The duties of the LRWQCB include the development of implementation plans for its hydrologic area, issuing waste discharge requirements, taking enforcement action against violators, and monitoring water quality. In March 1995, a Water Quality Control Plan for the Lahontan Region, North and South Basins (the "Basin Plan"), adopted by the LRWQCB, took effect. The Basin Plan contains standards for the protection of water quality within the region. The Basin Plan sets forth a series of land development guidelines intended to afford water quality protection for surface and groundwater.

Under the Basin Plan, water quality objectives define the upper concentration or other limits that the LRWQCB considers protective of beneficial uses. The general methodology used in establishing water quality objectives involves, first, designating beneficial water uses; and second, selecting and quantifying the water quality parameters necessary to protect the most vulnerable (sensitive) beneficial uses. Water quality objectives for water bodies within the Owens hydrologic unit, in which the Mammoth Lakes area is located, are listed for total dissolved solids, chloride, nitrate, total nitrogen, and phosphate (see Appendix G, *Hydrology and Water Quality Report*, of this Draft EIR) for Lake Mary Basin, Old Mammoth (town areas tributary to Mammoth Creek), Murphy Gulch, Sherwin Creek, Casa Diablo and Hot Creek/Laurel Creek. Casa Diablo and Hot Creek/Laurel Creek are downstream from the Town of Mammoth Lakes. Beneficial uses for

these water bodies are listed in Appendix G of this Draft EIR. Water bodies within the TSMP and SHARP areas are shown in **Figure 4.H-1, Identification of Affected Water Bodies**, below.

The Basin Plan identifies a set of specific policies regarding construction activities for new development involving soil disturbance of ¼-acre or more. The guidelines stipulate the specific components of this submittal, including the identification of interim erosion control measures to be applied during construction and short- and long-term erosion control measures to be employed following the construction phase.

The LRWQCB encourages that a low-impact planning approach be used for each project. Low impact design (LID) provides opportunities to avoid and minimize impacts starting at the source at initial stages of planning and project design. Examples of LID include minimizing changes to grades, maintaining historic storm drainage characteristics, avoiding creating source pollutants, avoiding concentration of runoff, maintaining historic runoff conditions, encouraging users to follow paths such that natural areas are left undisturbed, and avoiding placing pollutants in path of runoff.

(c) Town of Mammoth Lakes Memorandum of Understanding

In 1991, the LRWQCB and the Town of Mammoth Lakes adopted a Memorandum of Understanding (MOU) regarding storm water objectives and control measures. Per the MOU, the Town was granted the authority to issue construction permits for all developments less than one acre in size and provide site inspection. This MOU includes the following guidelines for the control and prevention of pollution from storm water:

1. Drainage collection, retention, and infiltration facilities shall be constructed and maintained to prevent transport of the runoff from a 20-year, 1-hour design storm from the project site.
2. Surplus or waste material shall not be place in drainage ways or within the 100-year flood plain of surface waters.
3. All loose piles of soil, silt, clay, sand, debris, or earthen materials shall be protected in a reasonable manner to prevent any discharge to waters of the State.
4. Dewatering shall be done in a manner so as to prevent the discharge of earthen material from the site.
5. All disturbed areas shall be stabilized by appropriate soil stabilization measures by October 15th of each year.
6. All work performed between October 15th and May 1st of each year shall be conducted in such a manner that the project can be winterized within 48 hours.
7. Where possible, existing drainage patterns shall not be significantly modified.
8. After completion of a construction project, all surplus or waste earthen material shall be removed from the site and deposited at a legal point of disposal.
9. Drainage swales disturbed by construction activities shall be stabilized by the addition of crushed rock or riprap as necessary or other appropriate stabilization methods.

10. All construction areas shall be protected by fencing or other means to prevent unnecessary disturbance.
11. During construction, temporary erosion control facilities (e.g., impermeable dikes, filter fences, hay bales, etc.) shall be used as necessary to prevent discharge of earthen materials from the site during periods of precipitation or runoff.
12. Revegetated areas shall be continually maintained in order to assure adequate growth and root development. Physical erosion control facilities shall be placed on a routine maintenance and inspection program to provide continued erosion control integrity.
13. Where construction activities involve the crossing and or alteration of a stream channel, such activities shall be timed to occur during the period in which streamflow is expected to be lowest for the year.

(d) Town of Mammoth Lakes Storm Drain Master Plan

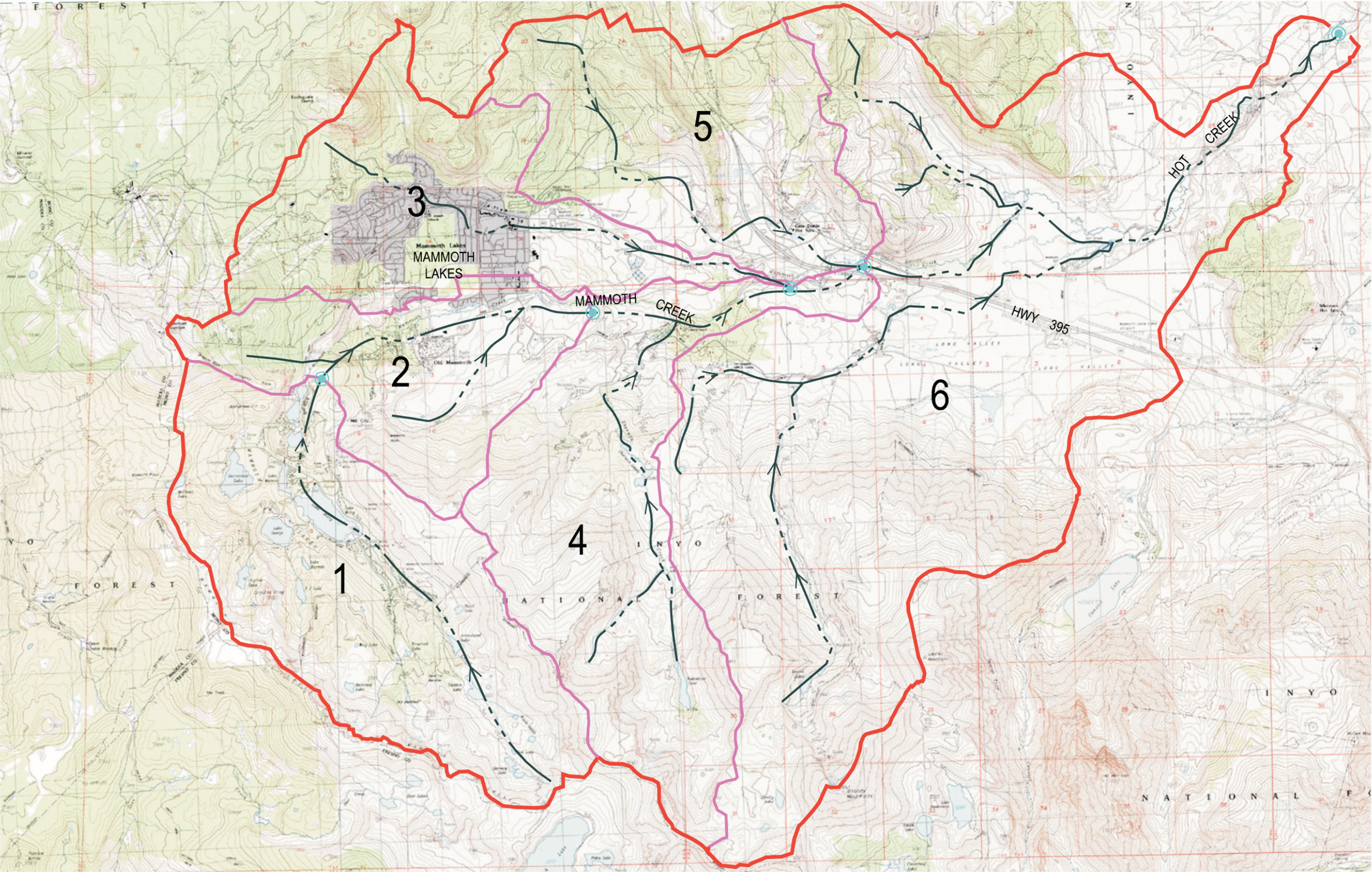
In response to potential erosion and flooding hazards as a result of increased urbanization, the Mono County Public Works Department prepared the Mammoth Lakes Storm Drain Master Plan (SDMP) dated July 1984, which included a Master Plan Report, Design Manual, and Implementing Ordinance. An update to the SDMP specific to the Town of Mammoth Lakes was completed on May 26, 2005. The 2005 SDMP was primarily formulated to control drainage and erosion problems by establishing a program to rehabilitate existing development areas, while also providing policies, standards, and procedures to guide future development.

The 2005 SDMP identifies several existing drainage problems in the Town including the following:

- Lack of a stable drainage system in much of the community located within the Urban Growth Boundary;
- Roadside and slope erosion due to uncontrolled runoff in poorly defined channels from steep areas;
- Drainage that crosses private property, and development in or near the natural drainage channels;
- Undersized culverts and channels; and
- Discharge of runoff from developed areas directly to Mammoth Creek resulting in high sediment loads to the creek and water quality degradation.

In response to these problems, the 2005 SDMP identifies general drainage improvements throughout the Town that would remedy existing drainage problems and accommodate Plan buildout development. Construction of the SDMP facilities can be spread out over a number of years. This would allow facilities to be built as they are needed or as further development occurs. Three priority levels have been established in the 2005 SDMP for construction of the improvements as summarized below:

- Priority 1 improvements focus primarily on eliminating existing drainage and erosion control problems;
- Priority 2 improvements include solutions to less critical drainage problems and facilities required to provide adequate drainage trunk capacity for the ultimate development; and



- WATERSHED BOUNDARY MAJOR
- WATERSHED BOUNDARIES
- FLOWLINE
- WATERSHED COLLECTION POINT

Watersheds and Affected Water Bodies in the Project Area

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- Priority 3 improvements include the remainder of SDMP facilities, which are principally improvements for local storm drainage.

The 2005 SDMP retains or improves natural streams, where possible, rather than replacing them with storm pipes (for aesthetic, economic, and functional purposes). Storm pipes would be placed in streets where feasible; however, some easements would be required on private property, primarily where existing development has occurred near stream zones. The updated SDMP recommends the Town replace corrugated metal pipelines that failed to transmit the required 20-year flows, with pipes of the same size made of concrete, PVC, HDPE, or other materials that do not have a rough texture.

The 2005 SDMP also includes guidelines for erosion control for the Mammoth Lakes area. In an effort to remedy drainage and erosion problems, the erosion guidelines prescribe requirements that must be followed during all phases of developments involving soil disturbance on one-quarter acre or more. The erosion guidelines also provide a basis for consistent design of storm drainage and erosion control facilities.

(e) Town of Mammoth Lakes Erosion, Drainage, and Flooding Project

The *Town of Mammoth Lakes Erosion, Drainage, and Flooding Project - Final Recommendations Report* (2008) was prepared to assist Town staff with the identification of existing erosion, drainage and flood related problem areas and to develop a prioritized list of localized solutions that would allow the Town to become proactive in the way it manages its stormwater. The work performed as part of this Report is intended to supplement and enhance work previously conducted for the 2005 SDMP. The Report addresses issues not presented in the SDMP, including:

- Discussion of flood prone areas;
- Impacts of erosion and sedimentation on the storm drain system;
- Existing condition of surface conveyance and capture facilities (i.e. earthen ditches, curb and gutter, AC dike, AC swale, drop inlets, catch basins, etc.);
- Impact of runoff from private impervious surfaces; and
- Issues related to snow removal activities or snow storage

Management strategies in the Report address existing erosion, drainage and or flooding problems in the Town. These include new or enhanced policies, the possible development of new ordinances, and program enhancements. The Final Recommendations Report recommends the Town apply erosion control and drainage improvement strategies to each flow path or area to ensure that adjacent projects are easily integrated and improvements constructed in one area do not create more or new erosion and drainage problems in another area.

According to the Final Recommendations Report, projects should be delineated so that either the entire project or a stand-alone phase can be implemented within the May 1 through October 15 construction season, as required by the Basin Plan and the existing MOU between the Town and the LRWQCB, unless provisions are in place to winterize the project within 48 hours.

The Final Recommendations Report recommends that, when feasible, urban runoff should be separated from upland runoff to minimize the volume of surface flow reaching the Town's storm drain infrastructure in some locations. Coordination with Caltrans, the USFS and Mammoth Mountain Ski Resort is recommended to attenuate and separate upland flows above the Forest Trail and Hillside Drive neighborhoods to address flooding in the North Village. The report also describes working with the USFS and Mammoth Mountain Ski Resort as an opportunity to implement erosion control and drainage improvements along the bike trail above the intersection of Minaret Road and Forest Trail.

The Final Recommendations Report places emphasis on reducing stormwater runoff peak flows and volumes through infiltration or detention. Recommendations include:

- Further evaluate open channels and earthen ditches in low gradient and highly developed areas (i.e. Sierra Valley Sites) to determine if they should be more frequently maintained, enhanced or replaced with storm drain to minimize the impacts of sedimentation, snow storage, parking, collection of residential garbage and the risk of flooding;
- Whenever possible, eliminate the discharge of concentrated surface flows to unprotected slopes greater than 2:1; and
- Identify opportunities to disperse flows at various locations eliminating concentrated discharge points to the maximum extent practicable.

The Final Recommendations Report also provides specific erosion control and flooding improvement measures. Erosion control measures address erosion from cut/fill slopes, eroding ditches, and unpaved parking areas. Controls include soil conditioning and revegetation, erosion control blankets, turf reinforced mats, retention systems, and rock slope protection. Other measures include turf reinforced mats, cobble or riprap lining, eco blocks, pavers, or porous pavement are recommended for unpaved parking areas. Devices also include prefabricated plastic channels.

Recommended drainage and flooding improvement measures primarily include infiltration devices such as shallow impoundments to infiltrate stormwater, infiltration trenches, drywells (subsurface structures that capture and slowly release stormwater, and level spreaders that reduce storm water velocity and encourage infiltration. Detention basins, which are ponds or low areas with an outlet designed to hold water for a specified period of time (generally 48 to 72 hours), are also recommended as flood improvement measures.

(f) Mammoth Lakes Drainage and Erosion Control Manual

The *Mammoth Lakes Drainage and Erosion Control Manual*,⁴ sets forth procedures for the planning and design of storm drainage and flood control systems and erosion control facilities. Procedures were developed specifically for application in the community of Mammoth Lakes and are used in conjunction with the Town of Mammoth Lakes SDMP and the *Town of Mammoth Lakes Erosion, Drainage, and Flooding Project - Final Recommendations Report* (2008). Requirements for project review and procedures for issuance of applicable grading and building permits include the calculation of runoff, evaluation of storm drainage systems, temporary runoff management, erosion control, temporary and permanent soil stabilization, and

⁴ Brown & Caldwell and Triad Engineering, *Design Manual – Mammoth Lakes Storm Drainage and Erosion Control*, prepared for Mammoth Lakes Department of Public Works (July 1984).

regulation procedures. The Manual provides the appropriate return period (exceedence intervals) for use in the design of storm drainage and erosion facilities. In all cases, the storm drain systems shall be sized to carry 100-year peak flows without damage to persons or property. Under the Manual, individual facilities in the system may have lower exceedence intervals, but should be designed to overflow to another portion of the storm drainage system when their capacity is exceeded. For example, if a storm drain overflows into the street, the capacity of the street, curb and gutter must be adequate to carry the 100-year peak flow without flooding adjacent property.

b. Existing Conditions

(1) Setting

The Project Area is located within the Mammoth Basin watershed, a distinct hydrologic area on the eastern slope of the Sierra Nevada. This approximately 71 square mile basin is part of the Long Valley Subunit of the Owens Valley Hydrologic Unit on the Lahontan Drainage Province. With the exception of approximately 2,600 acres of private lands which comprise the Mammoth Lakes community, the Basin consists primarily of wilderness and semi-wilderness lands under the jurisdiction of the Inyo National Forest. The Basin includes the entire watershed of Mammoth Creek, which is eventually tributary to the Owens River via Hot Creek. Mammoth Creek and Hot Creek are the same stream, but the name changes to Hot Creek downstream of the U.S. Highway 395 crossing due to historical precedent.

Watershed boundaries are physically defined by the Mammoth Crest divide of the Sierra Nevada on the south and west, by the Dry Creek drainage divide on the north, and by the Convict Creek drainage divide on the east. The total flow length of the Mammoth Creek/Hot Creek drainage system is approximately 18 miles. The Mammoth area drainage basin includes a complex drainage system comprised of lakes and interconnecting surface streams in the higher elevations of its southwestern portion. All of these lakes and streams are eventually tributary by either surface flow or underground flow to Mammoth Creek. The drainage basin eventually flows into the Owens River system. Within the Town limits there two watershed basins; (1) The southern portion of the community drains the Lakes Basin to Mammoth Creek; and (2) The northern portion of the community drains Mammoth Mountain and most of the drainage from Meridian Boulevard northward to Murphy Gulch. During high runoff periods, Murphy Gulch eventually flows into Mammoth Creek.

Past development within the Town, particularly prior to its incorporation, has created runoff and erosion problems by changing runoff volumes and flow patterns. Uncontrolled runoff has accelerated erosion and increased sediment and other pollutants in Mammoth and Hot Creeks. At present, only portions of the community are served by an integrated storm drainage system. Numerous natural or man-made surface channels traverse the community that contribute to runoff and erosion problems. The Town has been applying for grants to assist with the development of a plan to identify, prioritize and improve erosion, sedimentation and drainage problems.

Some areas along Mammoth Creek are located within Federal Emergency Management Agency (FEMA) designated 100-year flood zones.⁵ Mammoth Creek has a relatively small watershed (a total of

⁵ *Federal Emergency Management Agency Flood Insurance Study for the Town of Mammoth Lakes - Community Number 060724 (September 30, 1992).*

approximately 13.12 square miles) and a limited tributary system. As a result, flooding would be relatively shallow and, in some areas, would be expected to rise to only approximately one foot during a 100-year storm or flood event.⁶ However, because of Mammoth Creek's gradient most flooding would be of short duration. FEMA has designated several areas along Mammoth Creek as flood zones.

(2) Identification of Affected Waters and Beneficial Uses

Chapter 3 of the Basin Plan includes water quality objectives for certain water bodies within the Owens Valley hydrologic unit, which pertain to total dissolved solids, chloride, nitrate, total nitrogen, and phosphate.⁷ Watersheds addressed in the Basin Plan include Lake Mary Basin, Old Mammoth (town areas tributary to Mammoth Creek), Murphy Gulch, Sherwin Creek, Casa Diablo and Hot Creek/Laurel Creek. Casa Diablo and Hot Creek/Laurel Creek are downstream from the Town of Mammoth Lakes. **Table 4.H-1, Identification of Affected Waters, below,** describes these watershed areas.

Table 4.H-1

Identification of Affected Waters

Watershed	Descriptive Name	Description
1	Lake Mary Basin	Lakes Basin, tributary to Mammoth Creek
2	Old Mammoth	Town areas tributary to Mammoth Creek
3	Murphy Gulch	Town areas tributary to Murphy Gulch, then Mammoth Creek
4	Sherwin Creek	Downstream of town areas to Sherwin Creek, then Mammoth Creek
5	Casa Diablo	Downstream of town area north of Murphy Gulch, tributary to Mammoth Creek
6	Hot Creek/Laurel Creek	Downstream of town areas tributary directly to Hot Creek/Laurel Creek

Source: Triad-Holmes Engineering, 2011 from LRWQCB, Water Quality Control Plan for the Lahontan Region (1995)

Watershed areas 1 through 5 in Table 4.H-1 are tributary to Mammoth Creek. Beneficial uses of Mammoth Creek are as follows:

- Municipal and Domestic potable water supply
- Agricultural Supply
- Ground Water Recharge
- Freshwater Replenishment
- Water Contact Recreation

⁶ Paul Rote, P.E., Triad-Holmes Engineering, Telephone Interview, April 4, 2011.

⁷ LRWQCB, Water Quality Control Plan for the Lahontan Region, Table 3-17 (1995).

- Non-contact Water Recreation
- Commercial and Sport fishing
- Cold Freshwater Habitat
- Wildlife Habitat
- Rare, Threatened, or Endangered Species
- Migration of Aquatic Organisms
- Spawning, Reproduction, and Development

Watershed area 6 is directly tributary to Hot Creek and Laurel Creek. Hot Creek includes the same beneficial uses as Mammoth Creek except it is not a Freshwater Replenishment source, but adds the following uses:

- Industrial Service Supply
- Aquaculture

Laurel Creek has the following beneficial uses:

- Municipal and Domestic potable water supply
- Water Contact Recreation
- Non-contact Water Recreation
- Commercial and Sport fishing
- Cold Freshwater Habitat
- Wildlife Habitat Spawning, Reproduction, and Development.

Further descriptions of these beneficial uses are included in Chapter 2 of the Basin Plan.

(3) EPA Total Maximum Daily Load

Mammoth Creek is on California's 303d list for metals and mercury. **Table 4.H-2, 2006 CWA Subsection 303(d) List of Water Quality Limited Segments Requiring TMDLs**, below, identifies the existing pollutants in a 12-mile segment of Mammoth Creek that currently exceed the TMDL for the respective pollutants. TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. Achievement of the TMDL for metals and mercury in Mammoth Creek is expected in 2019. According to the 2010 (Proposed) CWA Subsection 303(d) list, the following segment of Mammoth Creek are water quality limited segments requiring TMDLs: a six-mile segment of Mammoth Creek between Old Mammoth Road and Highway 395 contains manganese, mercury and total dissolved solids pollutants; a two mile segment of Mammoth Creek between Twin Lakes

Table 4.H-2

**2006 CWA Subsection 303(d)
List of Water Quality Limited Segments Requiring TMDLs**

Region	Type	Name	Calwater Watershed	Pollutant/ Stressor	Potential Source	Estimated Size Affected	Proposed TMDL Completion
6	R	Mammoth Creek	60310053	Mercury	Source Unknown	12 miles	2019
				Metals	Other Urban Runoff, Natural Sources	12 miles	2019

Source: Excerpt from the 303(d) list presented on the LRWQCB website. Triad-Holmes Engineering, 2011.

outlet and Old Mammoth Road contains manganese and mercury; and a two-mile segment of a Mammoth Creek unnamed tributary at a confluence near Old Mammoth Road contains arsenic and mercury pollutants.⁸

2. ENVIRONMENTAL IMPACTS

a. Significance Thresholds

Appendix G of the *CEQA Guidelines*, the Initial Study Environmental Checklist form, includes questions relating to hydrology and water quality that are utilized as the thresholds of significance in this section. Accordingly, the Project may create a significant environmental impact if it would result in one or more of the following:

- Threshold 1: Violate any water quality standards or waste discharge requirements (refer to Impact Statement 4.H-1).
- Threshold 2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted) (refer to Section 6, *Other CEQA Considerations*, and the Initial Study contained in Appendix A. A less than significant impact would occur in this regard.).
- Threshold 3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site (refer to Impact Statements 4.H-2 and 4.H-3).

⁸ *Hydrology and Water Quality Report (March 2011) for the Project prepared by Triad-Holmes Engineering. Refer to Appendix G of this EIR.*

- Threshold 4: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off the site (refer to Impact Statement 4.H-2 and 4.H-3).
- Threshold 5: Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (refer to Impact Statement 4.H-2).
- Threshold 6: Otherwise substantially degrade water quality (refer to Impact Statement 4.H-1).
- Threshold 7: Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map (refer to Section 6, *Other CEQA Considerations*, and the Initial Study contained in Appendix A. No impact would occur in this regard.).
- Threshold 8: Place within a 100-year flood hazard area structures which would impede or redirect flood flows (refer to Impact Statement 4.H-3).
- Threshold 9: Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam (refer to Impact Statement 4.H-3).
- Threshold 10: Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow (refer to Section 6, *Other CEQA Considerations*, and the Initial Study contained in Appendix A. No impact would occur in this regard.).

b. Methodology

The evaluation of hydrology and water quality impacts is based on the comparison of the Project to applicable regulatory policies and the analysis contained in the *Hydrology and Water Quality* technical report prepared by Triad-Holmes. The Triad-Holmes report is contained in Appendix G of this EIR. Future projects, including Priority Projects, described in the TSMP and SHARP are not designed to the extent that specific hydrological analyses for individual projects could be conducted at this time. Therefore, impact assumptions are, in part, based on the type of terrain and additional known hydrological conditions of the Project Area and are not site-specific, unless stated otherwise.

c. Project Features

Project features include policies and/or design standards of the TSMP or SHARP that relate to hydrology or water quality as further described below.

(1) Trails System Master Plan

The TSMP contains several policies and design standards that related to hydrology and water quality, including the issue of erosion. Chapter 6, *Design Guidelines*, and Chapter 7, *Operations and Maintenance*, of the TSMP describe the following policies and recommendations:

The TSMP's discussion of *Trail Management Objectives* (TMOs), require that TMOs must be established prior to designing or constructing a trail to ensure that it meets the overall goals of the TSMP and adheres to the highest principals of sustainability. TMOs include Best Routing Location (BRL) Principles to be implemented where possible, such as avoiding wet meadows and wetlands and avoiding routing trails too close to other trail systems to minimize trail proliferation.

Specific design measures under the TSMP that are intended to avoid erosion (which, respectively, affects water quality) include the TSMP's Soft-Surface Trail Design Guideline's, trail routing specifications by soil type and establishment of average and maximum grade to improve sustainability of soil-based trails, both in their resistance to use and water-based erosion.

TSMP Table 6-6, *Trail Specifications by Soil Type*, identifies USGS soils types, including soils with a high level of erosion hazard. The table establishes an average grade and maximum grade standards for each soils type to reduce erosion potential and provides guidance is trail routing in order to mitigate potential undesirable environmental impacts and maintain the TMO. According the TSMP, the first component of determining an appropriate trail grade is "The Half Rule." This concept states that for most soils the trail grade should not exceed half the grade of the slope that it traverses. The TSMP states that any alignment that does not conform to this standard is considered to be a fall-line trail and will funnel water down the tread, resulting in accelerated water-based erosion. The TSMP's Maximum Sustainable Grade is the steepest individual section of trail on the native soil, which should not exceed 200 linear feet to minimize trail erosion.

The TSMP's *Trail Design Considerations* state that proper design, construction, and maintenance must be used in the development of erosion resistant, sustainable trails. Design considerations are described in Sections 6.1.5, *At-Grade Cross-Country Ski Crossing - Design Guidance*; Section 6.6.2, *Trail Construction and Guidelines*; and Section 7.2.1, *Paved Multi-Use Path Maintenance*, of the TSMP.

Design policies under TSMP Section 6.1.5 regarding cross country ski crossings, list the cross-sloping of crossings to adequately drain any melted water away from the roadway. According to the TSMP, small channels could be added to facilitate drainage if necessary.

Section 6.6.2, *Trail Construction and Guidelines*, of the TSMP identifies trail types and their relationship in avoiding or reducing erosion. Among identified trails and trail-building techniques are:

- Contour trails: Contour trails are designed so that the grade does not exceed half the grade of the surrounding slope and, as such, is counter to the erosion-prone fall-line trail;
- Grade reversals: Grade reversals are undulations within the trail tread (a short dip followed by a rise). This grade change in the tread catches water at the low point and diverts it off the trail. Grade reversals are the preferred erosion prevention technique. They require little maintenance once installed;

- Climbing turns: Climbing turns are used to change direction where there is no constructed platform or landing. The upper and lower legs of a climbing turn are joined by a short section of trail (the apex) that lies in the fall line. Water is shed to the inside of the trail turn. Berming of turns may be appropriate on preferred mountain biking trails where there is adequate drainage control prior to the turn; and
- Switchbacks: Switchbacks are a technique for moving a trail up steep side slopes. The transition is made by way of a flat landing or pad. A correct switchback will shed water off the back of the landing, and there is an immediate separation of trail segments.

Section 7.2.1, *Paved Multi-Use Path Maintenance*, of the TSMP suggests that ruts and water damage to be repaired periodically. Under this policy, checks for erosion along the trails should be done immediately after any storm that brings flooding to the local area.

(2) SHARP

SHARP policies do not identify additional erosion control measures in the prioritized or non-prioritized projects set forth in that plan, beyond those that are specified in the broader TSMP. However, several facilities, including Priority Projects including 9B (stacked loop trail system in the meadow), and other future projects, call for doggie bag stations along the main trail, which would reduce animal waste in surface water runoff.

In addition, the USFS relies on a number of trail construction related documents that include the *Trail Construction and Maintenance Notebook* (2007 Edition) and the *Forest Service Trails Management Handbook* (FSH 2309.18) for guidelines on building almost any type of trail, including soft-surface trails. These USFS documents would be referred to during the construction of trails within the SHARP area. Soft-surface trails recommended in the SSTC and/or the SHARP area would be designed in consideration of a number of factors that include: the intended trail user, type of soil, and average and maximum grades, amongst others. Trails would be designed to follow natural land contours and topography to the maximum extent feasible. Surface water control features to control erosion such as grade reversals, knicks, rolling grade dips, and water bars would be incorporated into soft-surface trail designs. Trail surfaces and routing would be determined based on a project-by-project basis. BRL Principals are included in the TSMP Design Guidelines and the SSTC (similar trail design standards are provided in the USFS trail construction documents).

Soft surface trail facilities constructed in accordance with the TSMP Design Guidelines and/or USFS standards would not only be designed to meet the needs of the intended users, but would be constructed with appropriate surfacing or tread so that the trail would not deteriorate over time and won't be eroded away by water and use.

d. Analysis of Project Impacts

The analysis of Project impacts regarding hydrology and water quality below applies to all future trail components associated with the Project, including the Priority Projects, unless stated otherwise.

(1) Water Quality

4.H-1 Project construction and operation may result in water quality impacts due to sheet erosion of exposed soils and subsequent deposition of particles and pollutants in the area's water bodies. Analysis has concluded that potentially significant water quality impacts would be reduced to a less than significant level with compliance to applicable regulatory requirements and implementation of the prescribed mitigation measures.

(a) Priority Projects

Construction and operation of the Priority Projects would have potential effects on water quality related to surface water runoff, erosion, dust, and other characteristics associated with recreational uses. General construction activities requiring clearing, grubbing (removing vegetation) and excavation have the potential to expose soils to the wind and rain and to increase siltation in nearby water bodies. (Potential dust impacts are addressed in detail in Chapter 4.B, *Air Quality*, of this EIR). **Table 4.H-3, Priority Projects**, below, summarizes the potential proximity of the Priority Projects to creeks and streams, FEMA-designated flood zones, and wetlands.

(i) Construction

As shown in Table 4.H-3, Priority Projects No. 1 (MUP 2-1), No. 6 (a backbone trail also known as SHARP Summer Project No. 7) and No. 7 (a connector trail also known as SHARP Summer Project No. 12b) would be located in the proximity of Mammoth Creek and, potentially, in close proximity to wetland areas and FEMA-identified 100-year flood zones. The potential proximity of Priority Projects No. 1, No. 6, and No. 7 to Mammoth Creek could increase the potential for adverse water quality effects on the Creek during construction of these projects. Adverse effects may include siltation caused by dirt and other construction debris flowing or falling into the stream. Any location of Priority Projects No. 1, No. 6, and No. 7 in proximity to potential wetlands also has the potential to cause degradation or loss of wetland habitat that serves as natural filters for pollutants, which in turn, could increase pollutants entering Mammoth Creek. Development of the Priority Projects in close proximity to water bodies could require CWA Section 401 and 404 Certification from the LRWQCB and, if wetland vegetation is present, a Fish and Game Code Section 1602 permit from the CDFG. Furthermore, all construction activities occurring within USFS lands would be required to comply with and implement all applicable water quality BMPs pursuant to the provisions of the USFS *Water Quality Management Handbook*, given that the USFS is the LRWQCB-designated WQMA for NFS lands. Section 401 Certification requires a permit for any activities that may result in a discharge of runoff into any waters of the U.S. and Section 404 Certification requires a permit before dredged or fill material may be discharged into a water body of the U.S. Such permits require inspection by the LRWQCB and CDFG, respectively, and the implementation of specific erosion-control or avoidance measures to reduce impacts to jurisdictional waters. Section 1602 permits would control the loss or removal of any wetland habitat and may require avoidance of such areas or mitigation. In areas where there are braided and random trails, having one improved trail would be expected to reduce overall erosion and environmental degradation in the vicinity of sensitive habitat, such as wetlands or montane meadow areas.

Table 4.H-3
Priority Projects

Priority Project	Project No. (Sharp Summer except as noted MUP)	Project	Affected waters and beneficial uses		Avoidance and minimization	Characterization of impacts - future(Yes)								Hydrologic Analysis				Low impact development	Potential Permitting Requirements ^b
			Watershed	Potentially Adjacent to Creek or Stream (N =-Not Expected)	Complete Avoidance (A) - Minimization (M)	Parking	Signage	Soft surface Non Motorized	Hard surface Non Motorized	Restroom	use existing trails	Creek Crossing	Bridge	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (n-not expected)	Potential Wetland (n-not expected)		N = Not Anticipated
1	MUP 2-1		2	Yes	M									2.3	8.3	Yes	Yes	Yes	401,404,1602
2	MUP 3-1		2/3	n	M									2.1/3.3	8.1/8.10	N	n	Yes	N
3	1	staging area	2	n	M	Yes	Yes			Yes				2.1	8.1	N	n	Yes	N
4	5b	connector trail	2	n	M			Yes						1, 2.3	None	N	n	Yes	N
5	6	connector trail	3	n	M				Yes					2.1	8.1	N	n	Yes	N
6	7	backbone trail	2	yes	M				Yes					2.1, 2.4, 2.5	8.6, 8.7	N	Yes	Yes	401/404/1602
7	12b	connector trail	2	yes	M			Yes					Yes	1	None	N	Yes	Yes	401/404/1602
8	13	connector trail	2	n	M			Yes						4	None	N	n	Yes	N
9	15	connector trail	2	n	M			Yes						2.3	None	N	n	Yes	N

^a “Drainage Basins” and “Drainage Exhibits” are found in the Town of Mammoth Lakes 2005 Storm Drain Master Plan (Exhibits)

^b Any project disturbing more than one acre requires submittal of a Notice of Intent to the Regional Water Quality Control Board.

Source: Triad-Holmes Engineering, 2011

Priority Projects that are not in direct proximity to Mammoth Creek have the potential to degrade water quality through the exposure of loose materials and exposed soils to wind and rain that enter a rill or are washed via sheet flow eventually to Mammoth Creek or one of its tributaries. In this regard, all development activities disturbing one acre or more are required to comply with the SWRCB's General Construction Activity Storm Water Permit, which requires the preparation and approval of an SWPPP that prescribes specific BMPs. BMPs, which must be approved and monitored by the LRWQCB, must reduce the potential for discharge of accidental and/or implicit pollutants into the storm drain system. The BMPs must be in place prior to issuance of a grading permit and designed to maintain construction areas in such a condition that storm flows do not carry wastes or pollutants off-site.

For Priority Projects under one acre, the MOU between the Town and the LRWQCB, described above, require the use of temporary erosion control measures during construction, soil stabilization at construction sites by October 15 of each year, elimination of waste material in drainage ways or 100-year flood plains, and similar measures. Additionally, Priority Projects occurring within National Forest lands would be required to comply with the provisions of the USFS *Water Quality Management Handbook*, which would also serve to minimize adverse water quality effects from construction activities. With the implementation of statutory erosion control measures (BMPs) or Section 1602 procedures, where required, water quality impacts during construction would be less than significant.

(ii) Operation

Priority Projects include paved and hard trails and a trailhead parking area that may increase point source pollutants (e.g., oil and grease in runoff). Unmitigated, this would be considered a potentially significant impact. Priority projects also include soft surface trails that may be subject to erosion as a result of their exposure to wind, rain, snow, and heavy non-vehicular traffic. The potential for erosion may be greater in areas in which gradient is steep or if exposed trails channel runoff from the surrounding area.

Because of their proximity to Mammoth Creek, CWA Section 402 and 404 Certification may also apply to the operation of Priority Projects No. 1, No. 6, and No. 7. If required, these projects would implement a SUSMP during operation to ensure that storm water pollution would not directly enter adjacent water bodies through the incorporation of BMPs approved by the LRWQCB. The SUSMP would provide numerical water quality design standards to ensure that storm water runoff is managed for water quality concerns.

Priority Projects that are not in proximity to a water body have the potential to indirectly degrade water quality through eroded materials, exposed soils, or pollutants from hard surfaces that are washed by sheet flow to Mammoth Creek or one of its tributaries. Individual projects of one acre or less may be required to maintain a SUSMP issued by the LRWQCB to control water runoff and any point source pollutants from entering groundwater or water bodies. MOU measures, including soil stabilization, removal of all surplus or waste earthen material from a site, routine inspection of physical erosion control facilities, and other maintenance requirements as implemented by the Mammoth Lakes Public Works Department, or as specified by USFS in accordance with applicable agency standards and guidelines would be required for Priority Projects under one acre.

In the case of Priority Projects carried out under Special Use Permit on National Forest lands, the USFS official responsible for permit issuance and administration will include in the special use permit under which the permittee must operate, details of the conditions that must be met including management requirements

and mitigation measures necessary to protect water quality. The permittee (Town) will be required to conform to all applicable State and local regulations governing water quality and sanitation. Accordingly, State water quality law may require that the permittee obtain a waste discharge requirement from the RWQCB. Failure on the part of the permittee to meet the conditions of the special use permit may result in the permit being revoked.

As described under *Project Features*, above, TSMP policies include TMOs for trail design that promote sustainability principals such as BRLs to avoid wet meadows and wetlands, trail routing according to soil type; and establishment of average and maximum grades to improve resistance to water-based erosion. The TSMP's *Trail Construction and Guidelines* promote drainage and flooding improvement measures such as infiltration devices, level spreaders that reduce storm water velocity and detention basins (ponds or low areas with an outlet designed to hold water for a specified period of time). In addition, as noted previously, projects occurring on NFS lands would be subject to relevant USFS standards and guidelines, such as those provided in the USFS's *Water Quality Management Handbook*, *Trail Construction and Maintenance Notebook*, and *Forest Service Trails Management Handbook*, including trail construction techniques and design features intended to minimize stormwater flow volumes and velocities in order to minimize erosion and associated water quality effects. These policies would support the reduction of erosion and the intention of the CWA to reduce pollutants to water bodies.

The Town's 2005 SDMP and *Erosion, Drainage, and Flooding Project - Final Recommendations Report* (2008) would also apply to the development of the Priority Projects within the UGB. These regulatory guidelines assist the Town in identifying erosion, drainage and flood related problem areas and establish hydrological standards and erosion control recommendations to ensure that improvements do not create more or new erosion and drainage problems. The SDMP relies strongly on detention basins to reduce sediment and nutrient load in the creek to improve beneficial use of the water. The Report also sets forth specific design features to reduce stormwater runoff peak flows and volumes through infiltration or detention and controls such as conditioning and revegetation, erosion control blankets, turf reinforced mats, retention systems, and rock slope protection.

(iii) Conclusion

The Priority Projects are those projects that would be developed first under the implementation of the TSMP. Drawings and surveys for each site to determine trail alignment, topography, scope of construction, areas of impermeability and other information needed for the determination of each project's water quality effects during construction and operation would require site-specific plans and drawings that would be prepared prior to initiation of each project. This information is not available at this time for evaluation in this EIR. However, implementation of BMPs, as required under CWA regulations and implementation of the applicable policies of the Town of Mammoth Lake's *Drainage and Erosion Control Manual*, 2005 *Storm Drain Master Plan*, 2008 *Erosion, Drainage, and Flooding Project*, TSMP, USFS-specified water quality BMPs, standards, and guidelines for trails construction, and proposed mitigation measures (see Subsection 3.C, *Mitigation Measures*, below) would provide regulatory conditions that would control practices relative to water quality. Several of these mitigation measures specifically address water quality; however, all mitigation measures that would control hydrological impacts and erosion would also address water quality issues. Enforcement of existing regulations and policies would also support LID policies to minimize changes to grades, to avoid creating source pollutants, and to avoid placing pollutants in path of runoff. With the implementation such regulations and measures, impacts to water quality during the construction and operation of Priority Projects are expected to be less than significant.

(b) TSMP Projects

The TSMP provides for a range of projects including MUPs, street crossings, bike lanes, and amenities at nodes. **Table 4.H-4, *MUP Projects***, below, summarizes the water quality and hydrological implications of the respective MUP projects. As shown in Table 4.H-4, MUP 2-1 (a Priority Project), MUP 3-4, MUP 3-5, MUP 3-9, MUP 3-10, MUP 3-11, MUP 3-13, MUP 4-4, and MUP 4-5 would be located adjacent to or near a creek or stream and within a potential wetland area. MUP 2-1 (a Priority Project), MUP 3-4, MUP 4-4, and MUP 4-5 are also potentially located within a FEMA identified flood zone. The proximity of these future projects to existing creeks, streams, and wetlands would increase the potential for direct contamination of these adjacent water bodies during the construction and operation of these projects. Direct contamination may include siltation caused by construction debris or eroded materials flowing or falling into the water bodies. CWA Sections 401 and 404 Certification from the LRWQCB and, if wetland vegetation is present, a Section 1602 permit from the CDFG, may be required to reduce water quality impacts to a less than significant level. The construction of these facilities may result in siltation which would be addressed through the implementation of a SWPPP required for all projects greater than one acre in size. Furthermore, construction and operation of new facilities within NFS lands would be required to comply with all water quality provisions contained in the USFS *Water Quality Management Handbook*, which would serve to address construction activities and ongoing maintenance of proposed trails and other facilities. Because MUPs would be used for non-motorized transportation, point source pollution from MUPs is not anticipated. Respective mitigation measures that would apply to future TSMP projects are listed under Section 4.H.3, *Mitigation Measures*, below.

The TSMP outlines approximately 20 locations where trails (MUPs or bike paths) would cross existing public streets and roadways, including two crossings on Minaret Road, five crossings on Lake Mary Road, five crossings on Main Street, four crossings on Meridian Boulevard, and four crossings on Old Mammoth Road. The crossings, which are summarized in **Table 4.H-5, *Street and Road Crossings***, below, would result in an increase in impermeable area in those locations where new pavement would be required (new pavement areas are shown in Table 4.H-4); however, no crossings are located in proximity to creeks, streams, or wetlands. The need for CWA Section 401 or 404 Certifications or CDFG permits for these projects is not anticipated. However, Mitigation Measures 4.H-5, 4.H-6, 4.H-17, and 4.H-18 to reduce dust and erosion during construction would be required for approximately 13 of the new crossings involving the construction of new pavement.

Approximately 24 bike lane projects outlined under the TSMP are summarized in **Table 4.H-6, *Bike Lane Projects***, below. As shown in Table 4.H-6, bike lane B2-7 (Old Mammoth Road between Main Street and Mammoth Creek), bike lane B3-12 (South Majestic Pines between Meridian Road and Waterford Street) and bike lane B5-1 (Sherwin Creek Road between the Borrow Site trailhead and U.S. 395) would be located adjacent to or in the vicinity of a creek or stream. None of these bike lane segments would be located in proximity to wetlands or within a FEMA flood zone. Bike lane B2-7 would not require the need for the construction of new pavement and, as such, the need for CWA certification is not expected. Construction of bike lane B3-12 and B5-1 may require CWA Certification. No CDFG permits would be required for any of the bike lane projects since none of these projects are located within wetland areas. As shown in Table 4.H-6, approximately 12 of the new bike lane projects may require the construction of additional pavement. Mitigation measures, including Mitigation Measures 4.H-5, 4.H-6, and 4.H-17, to reduce dust and erosion during construction would be required for projects involving the construction of new pavement. **Table 4.H-7, *Amenities at Recreation Nodes***, summarizes the potential relationship of amenity projects to creeks and streams, flood areas, and FEMA flood zones. As presented in Table 4.H-7, future projects No. 28

Table 4.H-4

Paved Multi-Use Paths

Priority Project	Project No.	Affected Waters and Beneficial Uses		Hydrologic Analysis				Potential Permitting requirements
		Watershed	Potentially Adjacent to Creek or Stream (N = Not Expected)	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (N = Not Expected)	Potential Wetland (N = Not Expected)	N = Not Anticipated
1	MUP 2-1	2	Yes	2.3	8.3	Yes	Yes	401,404,1602
	MUP 2-2	3	N	3.6	8.14	N	N	N
2	MUP 3-1	2/3	N	2.1/3.3	8.1/8.10	N	N	N
	MUP 3-2	3	N	3.3/3.4	8.10/8.11	N	N	N
	MUP 3-3	3	N	3.3	8.10	N	N	N
	MUP 3-4	2	Yes	2.3	8.3	Yes	Yes	401,404,1602
	MUP 3-5	3	Yes	3.6	8.13	N	Yes	401,404,1602
	MUP 3-6	3	N	3.2	8.1	N	N	N
	MUP 3-7	3	N	3.6	8.14	N	N	N
	MUP 3-8	3	N	3.6	8.14	N	N	N
	MUP 3-9	3	Yes	3.6	8.13	N	Yes	401,404,1602
	MUP 3-10	3	Yes	3.6	8.13	N	Yes	401,404,1602
	MUP 3-11	3	Yes	3.6	8.13/8.14	N	Yes	401,404,1602
	MUP 3-12	3	N	3.7	8.17	N	N	N
	MUP 3-13	3	Yes	3.6	8.16	N	Yes	401,404,1602
	MUP 4-1	3	N	3.4	8.11	N	N	N
	MUP 4-2	3	N	3.4	8.11	N	N	N
	MUP 4-3	3	N	3.4/3.7	8.11/8.17	N	N	N
	MUP 4-4	2	Yes	2.1	8.1	Yes	Yes	401,404,1602
	MUP 4-5	2	Yes	2.4	8.6	Yes	Yes	401,404,1602

^a "Drainage Basins" and "Drainage Exhibits" are found in the Town of Mammoth Lakes 2005 Storm Drain Master Plan (Exhibits)

Source: Triad-Holmes Engineering, 2011.

(Mill City), No. 34 (Twin Lakes Parking), No. 35 (Lake Mary Terminus), No. 36 (Tamarack Lodge), No. 80 (Horseshoe Lake), Nos. 88-90 (Coldwater Campground), No. 134 (Mammoth Creek Park East), and No. 152 (Mammoth Creek Park West) may be located adjacent to or near Mammoth Creek and potentially within wetland area. None of these are located within a FEMA-identified flood area.

(c) SHARP Projects

The SHARP provides for a range of summer and winter projects including trail heads, staging area, backbone trails, connector trails, dog walking area, interpretative trail, and other others. **Table 4.H-8, SHARP Summer Projects**, and **Table 4.H-9, SHARP Winter Projects**, below, summarizes the potential proximity of SHARP

Table 4.H-5
Street and Road Crossings

Project No.	Street	Location	Affected Waters and Beneficial Uses		Avoidance and Minimization	New Facilities			Hydrologic Analysis				Potential Permitting Requirements
			Watershed	Potentially Adjacent to Creek or Stream (N=Not Expected)	Complete Avoidance (A) - Minimization (M)	Fits on Existing Paving	Extra pavement Required	Comments - No Construction (NC) - Signage Only (SO)	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (N =not Expected)	Potential Wetland (N = Not Expected)	N = Not Expected
X 2-1	Minaret Road	Forest Trail	3	N	A	Yes		Yes	3.7	8.17	N	N	N
X 2-2	Minaret Road	North Village (Mid Block)	3	N	A	Yes		Yes	3.7	8.17	N	N	N
X 2-3	Lake Mary Road	Davison Road	3	N	M		Yes		3.6	8.16	N	N	N
X 2-4	Lake Mary Road	Lakeview Road	3	N	A	Yes		Yes	3.6	8.18	N	N	N
X 2-5	Lake Mary Road	Canyon Boulevard	3	N	A	Yes		Yes	3.6	8.13	N	N	N
X 2-6	Lake Mary Road	Bridges Lane	3	N	A	Yes		Yes	3.6	8.16	N	N	N
X 2-7	Lake Mary Road	Lee road	3	N	M		Yes		3.6	8.16	N	N	N
X 2-8	Main Street	Minaret Road	3	N	M		Yes		3.6	8.13	N	N	N
X 2-9	Main Street	Mountain Blvd	3	N	A	Yes		Yes	3.6	8.13	N	N	N
X 2-10	Main Street	Sierra Blvd	3	N	M		Yes		3.6	8.13	N	N	N
X 2-11	Main Street	Forest Trail	3	N	M		Yes		3.4	8.11	N	N	N
X 2-12	Main Street	Sierra Park Road	3	N	A	Yes		Yes	3.4	8.11	N	N	N
X 2-13	Meridian Boulevard	Minaret Road	3	N	M		Yes		3.6	8.14	N	N	N
X 2-14	Meridian Boulevard	Sierra Park Road	3	N	M		Yes		3.5	8.12	N	N	N
X 2-15	Meridian Boulevard	College Parkway	3	N	M		Yes		3.3	8.10	N	N	N
X 2-16	Meridian Boulevard	Wagon Wheel Road	3	N	M		Yes		3.3	8.10	N	N	N
X 2-17	Old Mammoth Road	Chateau Road	2	N	M		Yes		2.2	8.2	N	N	N
X 2-18	Old Mammoth Road	Minaret Road	2	N	M		Yes		2.3	8.3	N	N	N
X 2-19	Old Mammoth Road	Ski Trail	2	N	M		Yes		2.3	8.3	N	N	N
X 2-20	Old Mammoth Road	Waterford Avenue	2	N	M		Yes		2.3	8.3	N	N	N

^a “Drainage Basins” and “Drainage Exhibits” are found in the Town of Mammoth Lakes 2005 Storm Drain Master Plan (Exhibits)

Source: Triad-Holmes Engineering, 2011

Table 4.H-6
Bike Lane Projects

Project No.	Location	From	to	Affected Waters and Beneficial Uses		Avoidance and Minimization	Characterization of impacts		Hydrologic Analysis				Potential Permitting Requirements
				Watershed	Potentially Adjacent to Creek or Stream (N = Not Expected)	Complete Avoidance (A) - Minimization (M)	Bike Lane on Existing Paving	Extra Pavement Potentially Required	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (N = Not Expected)	Potential Wetland (N = Not Expected)	N = Not Anticipated
B 2-1	Minaret	Scenic Loop	Mammoth Knolls	3	N	A	Yes		3.7	8.17	N	n	N
B 2-2	Minaret	Mammoth Knolls	Main	3	N	A	Yes		3.7	8.17	N	n	N
B 2-3	Lake Mary	Davison	Minaret	3	N	A	Yes		3.6	8.16	N	n	N
B 2-4	Meridian	S. Majestic Pines	N. Majestic	3	N	A	Yes		3.6	8.16	N	n	N
B 2-5	Meridian	Sierra Park	203	3	N	A	Yes		3.3	8.10	N	n	N
B 2-6	Old Mammoth Road	Red Fir	Minaret	2	N	M		Yes	2.3	8.4	N	n	N
B 2-7	Old Mammoth Road	Main	Mammoth Creek	2/3	Yes	A	Yes		3.5/2.2	8.12/8.2	N	n	N (no extra pavement)
B 3-1	Forest Trail	Minaret	Canyon	3	N	M		Yes	3.7	8.18	N	n	N
B 3-2	Canyon	Lake Mary	Hillside	3	N	A	Yes		3.7	8.18	N	n	N
B 3-3	Lakeview Blvd	Rainbow	Canyon	3	N	A	Yes		3.7	8.18/8.19	N	n	N
B 3-4	Majestic Pines	Silver Tip	Lodestar	3	N	M		Yes	3.6	8.16	N	n	N
B 3-5	Chateau	Minaret	End	2	N	M		Yes	2.2	8.2	N	n	N
B 3-6	Sierra nevada	Azimuth	Sierra Park	3	N	A	Yes		3.5	8.12	N	n	N
B 3-7	Laurel Mountain	Main	Sierra Nevada	3	N	A	Yes		3.5	8.12	N	n	N
B 3-8	Tavern	Laurel Mountain	Sierra Park	3	N	A	Yes		3.5	8.12	N	n	N
B 3-9	Sierra Manor	Tavern	Meridian	3	N	A	Yes		3.5	8.12	N	n	N
B 3-10	Sierra Park	Main	end	3	N	M		Yes	3.5	8.12	N	n	N
B 3-11	Kelley	Lake Mary	Majestic Pines	3	N	M		Yes	3.6	8.16	N	n	N
B 3-12	South Majestic Pines	Meridian	Waterford	2	Yes	M		Yes	2.3	8.5	N	n	401,404,1602
B 4-1	Forest Trail	Canyon	Lakeview	3	N	M		Yes	3.7	8.19	N	n	N
B 4-2	Majestic Pines	Silver Tip	Lodestar	3	N	M		Yes	3.6	8.16	N	n	N
B 4-3	North Waterford	Majestic Pines	Old Mammoth	2	N	M		Yes	2.3	8.5	N	n	N
B 4-5	Davison Road	Lake Mary	Lakeview	3	N	M		Yes	3.6	8.16	N	n	N
B 5-1	Sherwin Creek Road	Borrow	395	2/4/6	Yes	M		Yes	2.1	8.1	N	n	401,404,1602

^a “Drainage Basins” and “Drainage Exhibits” are found in the Town of Mammoth Lakes 2005 Storm Drain Master Plan (Exhibits)

Source: Triad-Holmes Engineering, 2011

Table 4.H-7
Amenities at Recreation Nodes

Project No.	Project	Affected waters and beneficial uses		Avoidance and minimization	New Facilities (Existing = E)						Hydrologic Analysis					Potential Permitting requirements
		Watershed	Potentially Adjacent to Creek or Stream (N = Not Expected)	Complete Avoidance (A) - Minimization (M)	Parking	Restroom	Bus	Trail Access	Signage	Comments	Season	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (N - Not Expected)	Potential Wetland (N = Not Expected)	N = Not Anticipated
13	staging area	3	N	A	E	E	E	E	Yes	signage only	Winter			N	N	N
14	Eagle Lodge - temp	2/3	N	A	E	Yes	E	E	Yes	part of Eagle lodge project	Year-Round	3.6	8.15	N	N	N
21	Uptown/Downtown	3	N	A			E	E	Yes	signage only	Summer			N	N	N
27	Tamarack Street	2	N	A				E	Yes	signage only	Year-Round	2.5	8.7	N	N	N
28	Mill City	2	Yes	M	E		Yes	E	Yes	added impervious surface	Winter	2.3	None	N	Yes	401/404/1602
34	Twin Lakes Parking	1/2	Yes	A	E		Yes	E	Yes	on existing paving	Summer	1	None	N	Yes	N (on existing paving)
35	Lake Mary Terminus	1	Yes	A	E		Yes	E	Yes	on existing paving	Winter			N	N	N
36	Tamarack Lodge	1	Yes	A	E	E	E	E	Yes	signage only	Year-Round	1	None	N	Yes	N (signage only)
38	MMSA at Austria Hof	3	N	A				E	Yes	signage only	Summer	3.7	8.19	N	N	N
41	Lake Mary Bike Path NE Terminus	1	N	M		Yes	Yes	Yes	Yes	on existing paving	Summer			N	N	N
42	Earthquake Fault	3	N	M	E	E	Yes	E	Yes	on existing paving	Year-Round			N	N	N
44	Power Plant	3	N	M	Yes	Yes	Yes	Yes	Yes	up to 15 new parking spaces	Winter			N	N	N
46	Main Lodge	3	N	A	E	E	E	E	Yes	signage only	Year-Round			N	N	N
52	Sledz	3	N	A	E	E	E			signage only	Winter			N	N	N
64	Sierra Blvd at Forest Trail	3	N	M	Yes	Yes	Yes	E	Yes	up to 15 new parking spaces	Year-Round			N	N	N
67	Highway 203 Motorized Access	3	N	M	Yes	Yes					Year-Round			N	N	N
80	Horseshoe Lake	1	Yes	M	E	E	Yes	E	Yes		Summer	1	None	N	Yes	401/404/1602
86-87	Lake George	1	n	M	E	E	Yes	E	Yes		Summer	1	None	N	Yes	401/404/1602
88-90	Coldwater Campground		Yes	M	E	E	Yes	E	Yes		Summer	1	None	N	Yes	401/404/1602
97	Shady Rest Park	3	N	M	E	E	Yes	E	Yes		Year-Round	3.4	8.11	N	N	N
124	Welcome Center	3	N	M	E	E	Yes	E	Yes		Year-Round	3.4	8.11	N	N	N

Table 4.H-7 (Continued)
Amenities at Nodes

Project No.	Project	Affected waters and beneficial uses		Avoidance and minimization	New Facilities (Existing = E)						Hydrologic Analysis					Potential Permitting requirements
		Watershed	Potentially Adjacent to Creek or Stream (N = Not Expected)	Complete Avoidance (A) - Minimization (M)	Parking	Restroom	Bus	Trail Access	Signage	Comments	Season	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (N - Not Expected)	Potential Wetland (N = Not Expected)	N = Not Anticipated
134	Mammoth Creek Park, East	2	Yes	M	Yes	E	E	E	Yes	up to 15 new parking spaces	Year-Round	2.2, 2.3	8.3	Yes	Yes	401/404/1602
152	Mammoth Creek Park, West	2	Yes	A	E	E	E	E	Yes	signage only	Year-Round	2.2, 2.3	8.3	Yes	Yes	401/404/1602
158	Path along Snowcreek V Fenceline	2	N	M				Yes	Yes		Winter			N	Yes	401/404/1602
163	Sherwin Creek Road USFS gravel borrow pit	2	N	M	Yes	Yes	Yes	E	Yes	up to 15 new parking spaces	Year-Round			N	N	N
191	North Village	3	N	A	E	E	E	E	Yes	signage only	Year-Round	3.6, 3.7, 3.8	8.17	N	N	N
192	Shady Rest Sawmill Cutoff Road	3	N	M	E	Yes	Yes	E	Yes		Winter			N	N	N
193	Trails End Park	3	N	M	E	E	Yes	E	Yes		Year-Round	3.3	8.10	N	N	N
195	Community Center	3	N	M	E	E	Yes	Yes	Yes		Year-Round			N	N	N
200	Snowcreek 8 Access Egress Point	2	N	M				Yes	Yes		Year-Round	2.4	8.3	N	yes	N

^a “Drainage Basins” and “Drainage Exhibits” are found in the Town of Mammoth Lakes 2005 Storm Drain Master Plan (Exhibits)

Source: Triad-Holmes Engineering, 2011

Table 4.H-8
SHARP Summer Projects

Priority Project	Project No.	Project	Winter Designation	Affected waters and beneficial uses		Avoidance and minimization	New Facilities								Hydrologic Analysis				Potential Permitting requirements
				Watershed	Potentially Adjacent to Creek or Stream (N = Not Expected)	Complete Avoidance (A) - minimization (M)	Parking	Signage	Soft Surface Non Motorized	Hard Surface Non Motorized	Restroom	Use Existing Trails	Creek Crossing	Bridge	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (N = Not Expected)	Potential Wetland (N = Not Expected)	N = Not Anticipated
3	1	staging area	1,2,3	2	N	M	Yes	Yes			Yes				2.1	8.1	N	N	N
	2	trailhead	5c	2	N	M	Yes	Yes							2.5	8.4	N	N	N
	3	access point	5a	2	yes	A		Yes							2.4	8.6	N	Yes	N (signage only)
	4	staging area	6	2	N	M	Yes	Yes			Yes				2.3	8.4	N	N	
	5a	connector trail	7,8	2	N	M			Yes						2.5	8.4	N	N	N
4	5b	connector trail		2	N	M			Yes						1, 2.3	None	N	N	N
	5c	connector trail		2	N	M			Yes						1, 2.3	None	N	N	N
5	6	connector trail		3	N	M				Yes					2.1	8.1	N	N	N
6	7	backbone trail		2	yes	M				Yes					2.1, 2.4, 2.5	8.6, 8.7	N	Yes	401/404/1602
	8	stacked loop trail	9a	2	N	M				Yes					2.4	None	N	N	N
	9a	convert USFS road		2/4	N	A			Yes			Yes			4	None	N	N	N
	9b	stacked loop trail		4	N	A			Yes			Yes			4	None	N	N	N
	10	connector trail		2/3	yes	M			Yes				Yes	Yes	3.2, 4	8.9	Yes	Yes	401/404/1602
	11	consolidate existing trails		2	yes	A			Yes			Yes			4	None	Yes	Yes	401/404/1602
	12a	staging area	16	2	yes	M	Yes	Yes							1	None	N	Yes	401/404/1602
7	12b	connector trail		2	yes	M			Yes					Yes	1	None	N	Yes	401/404/1602
8	13	connector trail		2	N	M			Yes						4	None	N	N	N
	14	connector trail		2	N	M			Yes						2.3	None	N	N	N
9	15	connector trail		2	N	M			Yes						2.3	None	N	N	N
	16	connector trail	12a	2	N	M			Yes						2.3	None	N	N	N
	17	access point		2	N	M			Yes						2.3	None	N	N	N
	18	connector trail		2	N	A			Yes			Yes			2.4	None	N	N	N
	19	study (no project)\		2	N	A									4	None	N	N	N
	20	omitted			N	A									-	-	N	N	N
	21	summer biathlon course		4	N	A						Yes			4	None	N	N	N
	22	dog-leash policy	9b	All	N	A						Yes			-	-	N	N	N
	23	omitted			N	A									-	-	N	N	N
	24	interpretive trail		2	N	M			Yes						2.3	None	N	N	N
	25	promote Hayden Cabin	10a	2	Yes	A						Yes			2.1	8.1	yes	yes	401/404/1602
	26	trail		2	N	A			Yes			Yes			2.4	None	N	N	N
	27	omitted			n	A									-	-	n	n	N
	28	public transit stops		1/2/3/4	n	A									1, 2.1, 2.3, 2.4	8.1, 8.4, 8.6	n	n	N

Table 4.H-8 (Continued)

SHARP Summer Projects

Priority Project	Project No.	Project	Winter Designation	Affected waters and beneficial uses		Avoidance and minimization	New Facilities								Hydrologic Analysis				Potential Permitting requirements
				Watershed	Potentially Adjacent to Creek or Stream (N = Not Expected)	Complete Avoidance (A) - minimization (M)	Parking	Signage	Soft Surface Non Motorized	Hard Surface Non Motorized	Restroom	Use Existing Trails	Creek Crossing	Bridge	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (N = Not Expected)	Potential Wetland (N = Not Expected)	N = Not Anticipated
	29	connector trail		2/4	n	M			Yes						4	None	n	n	N
	30	signage and wayfinding		All	n	M	Yes	Yes							-	-	n	n	N
	31	retain USFS system trails		All	n	M		Yes							-	-	n	n	N

^a “Drainage Basins” and “Drainage Exhibits” are found in the Town of Mammoth Lakes 2005 Storm Drain Master Plan (Exhibits)

Source: Triad-Holmes Engineering, 2011

Table 4.H-9
SHARP Winter Projects

Priority Project	Project No.	Project	Summer Designation	Affected waters and beneficial uses		Avoidance and minimization	New Facilities						Hydrologic Analysis				Potential Permitting Requirements
				Watershed	Potentially Adjacent to Creek or stream (N = Not Expected)	Complete Avoidance (A) - minimization (M)	Parking	Signage	groomed	restroom	use existing trails	Comments - No Construction (NC) - Signage Only (SO)	Drainage Basin ^a	Drainage Exhibit ^a	Potential FEMA identified Flood Zone (n-not expected)	Potential Wetland (n-not expected)	Not Anticipated (N)
3	1	staging area	1	2	N			Yes		Yes			2.1	8.1	n	n	N
	2	snowplay area	1	2	N	A						NC	2.1	None	n	n	N
	3	Off loading	1	2	N	A		Yes				SO	2.1	8.1	n	n	N
	4	omitted			N	A						NC	-	-	n	n	N
	5a	access point	3	2	Yes	A		Yes				SO	2.4	8.6	n	yes	N (signage only)
	5b	access point		2	N	A		Yes				SO	2.5	8.7	n	n	N
	5c	trailhead	2	2	N	A		Yes				SO	2.5	8.7	n	n	N
	6	staging area	4	2	N		Yes	Yes		Yes		added impervious surface	2.3	8.4	n	n	N
	7	connector	5a	2	N	M		Yes				SO	2.4	None	n	n	N
	8	grooming		2	N	A			Yes			NC	2.3	None	n	n	N
	9a	convert USFS road	8	2	N	A		Yes	Yes			SO	2.4	None	n	n	N
	9b	dog policy			N	A		Yes				SO	-	-	n	n	N
	10a	connector trail	25	2	Yes	M			Yes			NC	2.1	8.1	yes	yes	401/404/1602
	10b	Off leash dog area		2	N	A		Yes				SO	2.1	8.1	n	n	N
	11	omitted			N	A						NC	-	-	n	n	N
	12	Public transit stops	28		N	A						NC	1, 2.1, 2.3, 2.4	8.1, 8.4, 8.6	n	n	N
	13	Signage			N	A		Yes				SO	-	-	n	n	N
	14	omitted			N	A						NC	-	-	n	n	N
	15	omitted			N	A						NC	-	-	n	n	N
	16	staging area	12a	1	Yes	M	Yes	Yes				added impervious surface	1	None	n	yes	401/404/1602
	17	Improved trail		1	N	A		Yes	Yes			SO	1	None	n	n	N
	18	partly groomed zone		2	N	A			Yes			SO	2.4, 4	None	n	n	N
	19	retain trails depicted as USFS trails on Summer Map	31		N	A					Yes	NC	-	-	n	n	N

Source:

projects to creeks and streams, FEMA-designated flood zones, and wetlands. As shown in Table 4.H-8, Summer Project No. 3 (an access point also known as Winter No. 5a); Summer Project No. 7 (a Priority Project); Summer Project No. 10 (a connector trail); Summer Project No. 11 (a trail consolidation project); Summer Project No. 12a (a staging area also known as Winter Project No. 16); Summer Project No. 12b (a connector trail), and Summer Project No. 25 (Hayden Cabin also known as Winter Project No. 10a) are located adjacent to or in close proximity to a creek or stream. Of these, Summer Project No. 10 involves a creek crossing and bridge and Summer Project No. 12b involves a bridge. All of these projects are located within potential wetlands and Summer Projects No. 10, 11, and 25 are located within a potential FEMA-identified flood area. The proximity of these projects to existing creeks, streams, and wetlands increases the potential for direct contamination of these adjacent water bodies during the construction and operation of these projects. With the exception of Summer Project No. 3, which involves new signage only, all of the Summer and Winter projects in proximity to water bodies would require CWA Section 402 and 404 Certification from the LRWQCB and, if wetland vegetation is present, a Fish and Game Code Section 1602 permit from the CDFG in order to reduce direct impacts.

Trails projects that are not in proximity to a water body have the potential to indirectly degrade water quality through eroded materials, exposed soils, or pollutants that are washed by sheet flow into a rill or directly into the groundwater, from which it can eventually enter a water body. In this regard, all development activities disturbing one acre or more would require the preparation and approval of SWPPP and SUSMP programs that prescribe specific BMPs to eliminate the potential discharge of accidental and/or implicit pollutants into the storm drain system. Additionally, construction and operation of new facilities within NFS lands would be required to comply with all water quality provisions contained in the USFS *Water Quality Management Handbook*, which would serve to address construction activities and ongoing maintenance of proposed trails.

With the exception of Priority Projects, No. 3 through 9, SHARP projects represents future, long-range projects, which, to some extent, are uncertain. Information regarding potential non-permeable surfaces, site topography and other information required for the determination actual water quality effects would require site-specific plans and drawings that are not available for evaluation in this EIR. However, implementation of USFS-required BMPs and CWA Section 401 and 404 certification procedures, as required and enforced by the USFS and LRWQCB, respectively, and several of the mitigation measures provided below (see Subsection 3, *Mitigation Measures*) would provide regulatory conditions that would control practices relative to water quality during construction and operation of the eventual trail system. Enforcement of existing regulations, policies, and mitigation measures would also support LID policies to minimize changes to grades, to avoid creating source pollutants, and to avoid placing pollutants in path of runoff. Therefore, with the implementation of existing regulations and proposed mitigation measures, impacts related to water quality are expected to be less than significant.

(2) Hydrology/Surface Water Runoff

14.H.2 The Project would cause a minor increase in impermeable surfaces and the construction of some trails may change drainage patterns by creating potential channels for surface water runoff. However, with the implementation of the requirements of the Town of Mammoth Lakes 2005 Storm Drain Master Plan; the 2008 Erosion, Drainage, and Flooding Project; applicable standards and guidelines set forth by the USFS, and applicable SWPPP and SUSMP (intended to protect the water quality) the Project would not substantially increase runoff or alter the existing drainage patterns of the area. Therefore, the impact of the Project with respect to storm water and other drainage patterns would be less than significant.

(a) Priority Projects

Construction and operation of Priority Projects would increase impermeable surfaces associated with MUP 2-1 and MUP 3-1 (paved multi-use paths). The construction and long-term use of other Priority Projects, including the proposed Borrow Area staging site and hard and soft surface trails, would potentially change some existing vegetated areas to non-vegetated areas and allow the channeling of water through cleared trail surfaces. Table 4.H-3, Priority Projects, above, summarizes the hydrological areas corresponding to the 2005 SDMP, for each Priority Project. The SDMP, which applies to improvements within the Town's UGB, provides a hydrologic methodology that provides for the assessment of runoff and its effect on downstream conditions. It also outlines improvements needed for 20-year and 100-year storm events. Under the SDMP, control and retention of storm water is an important method of reducing the rate of surface water runoff and to avoid down-stream flooding. Implementation of the hydrological calculations provided in the SDMP would allow for the development of design features to reduce or appropriately channel runoff.

The *2008 Erosion, Drainage, and Flooding Project* provides drainage improvements strategy including separating, where feasible, upland runoff from urban runoff to minimize the volume of surface flow reaching the Town's storm drain infrastructure. Recommendations also include eliminating the discharge of concentrated surface flows to unprotected slopes greater than 2:1 and dispersing flows at various locations to eliminate concentrated discharge points to the maximum practical extent. Controls include the use of cobble or riprap for slope protection. Drainage and flooding improvement measures also include infiltration devices such as shallow impoundments to infiltrate stormwater, infiltration trenches, drywells (subsurface structures that capture and slowly release stormwater, and level spreaders that reduce storm water velocity and encourage infiltration. Detention basins, which are ponds or low areas with an outlet designed to hold water for a specified period of time are also recommended as flood improvement measures.

For projects less than one acre, the MOU between the Town and LRWQCB requires existing drainage patterns to not be significantly modified; stabilization of drainage swales disturbed by construction through the application of crushed rock or riprap; and, where construction activities involve the crossing and or alteration of a stream channel, the timing of such activities to occur when stream flow is expected to be lowest for the year.

The TSMP also contains policies and design standards policies that encourage LID and that would be applicable to Priority Projects. These include discouraging the proliferation of trails (locating trails too close to each other); establishing a maximum gradient not to exceed half the grade of the slope that it traverses to avoid a fall trail line that, otherwise, funnels water down the tread; maintaining steepest individual trail sections to 200 linear feet or less; cross-sloping of crossings to shed water; adding small channels to facilitate drainage, if necessary; using grade reversals (a short dip followed by a rise) to reduce flooding; and other measures to shed water from the trail surface.

The Priority Projects are those projects that would be developed first under the implementation of the TSMP and SHARP. Further study and analysis of each site to determine trail alignment, topography, scope of construction, areas of impermeability and other information required for the determination of each project's surface water runoff and hydrological effects during construction and operation would be required, including site-specific plans and drawings that would be prepared prior to initiation of each project. This information is not available at this time for evaluation in this EIR. However, implementation of BMP programs under SWPPPs and SUSMP's, where required under CWA regulations, and implementation of the

applicable policies of the Town of Mammoth Lake's *Drainage and Erosion Control Manual*, 2005 *Storm Drain Master Plan*, 2008 *Erosion, Drainage, and Flooding Project*, TSMP, and several of the mitigation measures provided below (see Subsection 3.C, *Mitigation Measures*) would provide additional measures to address hydrological impacts associated with these projects. Furthermore, as noted above, construction and operation of Priority Project new facilities within NFS lands would be required to comply with all water quality provisions contained in the USFS *Water Quality Management Handbook*, many of which would serve to minimize the volume and velocity of stormwater flows that could eventually be introduced into storm drainage facilities within the Planning Area. Enforcement of existing regulations, policies, and mitigation measures would also support LID policies to minimize changes to grades, maintain historic storm drainage characteristics, avoid concentration of runoff, maintain historic runoff conditions, and encourage users to follow paths such that natural areas are left undisturbed. With the implementation such measures, impacts to surface water runoff during the construction and operation of Priority Projects are expected to be less than significant.

(b) TSMP Projects

Future TSMP projects, including MUPs, street crossings, bike paths, and amenities at nodes, would increase impermeable surfaces in the area. The TSMP proposes approximately 20 MUP segments (paved multi-use paths) that total approximately 10.1 miles. Additional pavement would also be required at 13 of the approximately 20 street crossings and for 12 of the approximately 24 bike paths. It is also anticipated that some pavement or building foundations would be constructed for the approximately 30 amenities-at-nodes projects proposed under the TSMP. The increase in impermeable surfaces would increase storm water runoff to the existing Mammoth Lakes drain system. Although it is not possible to quantify the precise increase in runoff, increased uncontrolled, storm runoff has the potential to overwhelm the Town's existing and proposed drainage system and cause local flooding.

Tables H.4-4 through H.4-7, above, summarize the hydrological areas corresponding to the 2005 SDMP, for each TSMP project. The SDMP provides a hydrologic methodology for the assessment of runoff and its impact on downstream conditions. It also outlines improvements needed for 20 year and 100 year storm events. Under the SDMP, control and retention of storm water in is an important method of reducing the rate of surface water runoff. The *Erosion, Drainage, and Flooding Project* also contains drainage improvement strategies.

In addition, the MOU requires drainage improvement features for smaller projects and the TSMP provides design policies for trails that establish maximum gradient and the use of small channels and other features to control runoff.

It should be noted that the TSMP may have beneficial effects on existing conditions with regard to surface water runoff by consolidating and formalizing currently unauthorized dirt trails and use paths, or by improving areas used informally on an existing basis for parking and staging, including the provision of new storm drainage facilities that would control surface runoff.

With the exception of Priority Projects MUP 2-1 and MUP 3-1, the proposed TSMP represents future, long-range projects, which, to some extent, are uncertain. Information regarding potential non-permeable surfaces, site topography and other information required for the determination actual surface water runoff and hydrological effects would require site-specific plans and drawings that are not available for evaluation

in this program-level EIR. However, implementation of MOU policies for projects less than one acre and CWA Section 401 and 404 certification procedures, as required and enforced by the LRWQCB, several of the mitigation measures provided below (see Subsection 3, *Mitigation Measures*) would provide regulatory conditions that would control practices relative to hydrology and surface water runoff during construction and operation of the eventual trail system. Enforcement of existing regulations, policies, and mitigation measures would also support LID policies to minimize changes to grades, maintain historic storm drainage characteristics, avoid concentration of runoff, maintain historic runoff conditions, and encourage users to follow paths such that natural areas are left undisturbed. Therefore, with the implementation of existing policies, regulations and proposed mitigation measures, impacts related to surface water runoff and hydrology are expected to be less than significant.

(c) SHARP Projects

Future SHARP projects include trail heads, a staging area, backbone trails, connector trails, and other primarily soft-surface trails. The development of trails would potentially change some existing vegetated areas to non-vegetated areas and allow the channeling of water through cleared trail surfaces. Tables H.4-8 and H.4-9, above, summarize the hydrological areas corresponding to the 2005 SDMP, for each SHARP project. As shown in Table 4.H-8, Sharp Summer Projects No. 10 and 12b involve the construction of a bridge over a water body. Any development that would constrain the water flow during flood conditions has the potential to change the water course or cause other hydrological problems. Therefore, Mitigation Measure 4.H-3 to ensure adequate clearance above flood waters is recommended.

For the most part, SHARP represents future, long-range projects, which, to some extent, are uncertain. Information regarding potential non-permeable surfaces, site topography and other information required for the determination actual surface water runoff and hydrological effects would require site-specific plans and drawings that are not available for evaluation in this EIR. However, implementation of CWA Section 401 and 404 certification procedures, as required and enforced by the LRWQCB, and several of the mitigation measures provided below (see Subsection 3, *Mitigation Measures*) would provide regulatory conditions that would control practices relative to surface water and hydrology during construction and operation of the eventual trail system. Additionally, new facilities within NFS lands would be required to comply with all water quality provisions contained in the USFS *Water Quality Management Handbook*, which would manage stormwater flows from proposed trails and other SHARP project facilities. Projects constructed by the Town are required to comply with the SWRCB and have an NOI which certifies compliance with the general construction permit. Therefore, with the implementation of existing regulations and proposed mitigation measures, impacts related to surface water runoff and hydrology are expected to be less than significant.

(3) Flooding

4.H-3 The Project would locate trails and amenities within FEMA-designated 100-year flood zones and expose users to potential flood conditions. Any bridges placed across waterways could potentially exacerbate flood conditions. With trail design consistent with existing regulatory design manuals, location of facilities outside areas of flooding in excess of one foot and/or cautionary signage (mitigation measure), the risk of loss, injury or death involving flooding would be reduced to a less than significant level.

As discussed under Section 1.b, *Existing Conditions*, above, some areas along Mammoth Creek are located within FEMA-designated 100-year flood zones (Flood Insurance Study for the Town of Mammoth Lakes). This study indicates both the potential for flooding (A) and estimated water depth (E) for areas in excess of

one foot. Because Mammoth Creek has a relatively steep gradient and small watershed (a total of approximately 13.12 square miles) potential flooding would be of short duration and relatively shallow. In some designated zones, flood waters would be expected to rise to only approximately one foot during a 100-year storm or flood event. Priority Project (MUP2-1), which would fill in a gap on the Main Path along Old Mammoth Road between Mammoth Creek Park and Minaret Road, would potentially be located within a FEMA-designated 100-year flood zone in the vicinity of Mammoth Creek Park. The potential location of MUP 2-1 in a designated flood zone would expose users to potential hazards during flood conditions, including potential water-borne debris. Mitigation Measure 4.H-3 to reduce this potential impact to a less than significant level is recommended below.

If the trail were constructed on a berm or dike-like foundation within the flood zone, the facility would have the potential to block water flow and exacerbate flooding. However, standard engineering practices currently enforced by the Mammoth Lakes Department of Public Works prohibit the construction of facilities within flood areas that would block or affect the natural flow of flood water. With the enforcement of standard engineering practices and regulations, potential flood conditions caused by the MUP would be reduced to a less than significant level.

Future TSMP projects MUP3-4, MUP 4-4, MUP 4-5, No. 134 (amenities at Mammoth Creek Park East) and No. 152 (amenities at Mammoth Creek Park West) would potentially be located within FEMA designated 100-year-flood zones within the proximity of Mammoth Creek. In addition, SHARP Summer Project No. 10 (connector trail), SHARP Summer Project No. 11 (trail consolidation project), and SHARP Summer Project No. 25 (Hayden Cabin, also known as SHARP Winter Project No. 10a) would be potentially located within FEMA designated 100-Year flood zones. As previously discussed, if these trails and facilities were located directly within the designated flood zones, a potential for increased hazard to the public would occur. Mitigation measures are recommended to reduce flood hazard to a less than significant level.

Priority Project 7 (SHARP Summer Project 12b) would require the construction of a bridge across Mammoth Creek and SHARP Summer Project 10 may require a creek crossing and bridge over tributaries to Mammoth Creek (intermittent streams). Within flood zones, bridges have the potential to detain or divert flood water or to capture water-borne debris and, thus, worsen flood conditions. Under engineering practices currently regulated by the Mammoth Lakes Department of Public Works, bridge pilings and spans must provide a clear horizontal and vertical span of one foot above the high water line for a 100-year storm or 100-year-flood, whichever is greater (see Mitigation Measure 4.H-3). With the enforcement of standard engineering practices, including Mitigation Measure 4.H-3) and existing regulations, potential flood conditions caused by the MUP would be reduced to a less than significant level.

3. MITIGATION MEASURES

Mitigation measures are provided that would address potential water quality, surface water/hydrological, and flood impacts. In addition to mitigation measures, existing CWA regulations, including CWA 401 and 404 certification permits would be implemented on a site-by-site basis for individual projects, as applicable.

Mitigation Measure 4.H-1: Development and siting of individual projects shall avoid to the extent feasible modification of hydrologic conditions, including alteration of flow regimes and disruption of watershed levels.

- Mitigation Measure 4.H-2:** No structures, such as foundation berms, shall be designed or constructed in FEMA designated 100-year flood zones in such a way as to retain, divert or, otherwise exacerbate flooding conditions for adjacent properties. All bridges shall maintain a clear span of one foot, vertically and horizontally, from the high water mark of a 100-year storm or flood, whichever is greater.
- Mitigation Measure 4.H-3:** Placement of trails and trails-related facilities in areas subject to flooding depths in excess of one foot shall be avoided to the extent feasible. Where designated areas of flooding in excess of one foot cannot be avoided, signage shall be provided to warn of potential flood hazard.
- Mitigation Measure 4.H-4:** Measures to reduce erosion shall be implemented in the design of all trails. Measures shall include but not be limited to any of the following, as appropriate:
- a. Diversion and dissipation of standing water to adjacent landscape
 - b. Directing of concentrated flows to velocity dissipaters to control erosion or limit flows to overland sheet flow
 - c. Aligning paths to avoid concentration of runoff
 - d. Maintaining natural depressions to allow natural storm attenuation
- Mitigation Measure 4.H-5:** Where projects are not required to file a SWPPP on the Storm Water Multiple Application and Report Tracking System (SMARTS), each project shall install and maintain appropriate BMP's in conformance to the methods identified in the California Stormwater Quality Association (CASQA) handbook of Best Management Practices. The BMP's used shall relate to the type of work required for each project. All BMP's shall be considered for each project following the BMP checklist. A note shall be made as to the reason for not incorporating any specific BMP.
- Mitigation Measure 4.H-6:** Trail alignments shall be designed to the extent feasible to avoid wet areas, springs, wetlands, and the lower portions of slopes, especially those that are north facing. Where such features cannot be avoided, improvements such as boardwalks, turnpikes, puncheons, or other effective means of elevating the trail tread above sensitive resources, as determined appropriate by the Town and/or USFS, shall be implemented. Replacement, restoration or other suitable measures as required by CDFG, ACOE and the Basin Plan may also be required if avoidance of wetland areas is not feasible.
- Mitigation Measure 4.H-7:** Crossing structures shall be provided at year-round stream crossings to protect wetland areas. Necessary streams and wetlands crossings shall minimize channel crossing dimension by selecting narrow areas where root support is adequate for bridge footings, and spans are outside of flood waters or subject to floodplain dynamics, whenever possible.

- Mitigation Measure 4.H-8:** Prior to construction of trails facilities, engineering analysis shall be completed to determine the presence of water resources, including wetlands, streams, and riparian areas (i.e., areas along the banks of a stream or river). Any such resources located within 200 feet of any proposed trail or facility, shall be identified as “receiving resources” and mapped. Such mapping shall be consulted regarding potential for sediments deposits, placement of trail drainage structures, maneuvering of maintenance equipment, season of work, interception and infiltration of trail drainage, and disposal of earth materials generated during construction or maintenance activities. Design considerations such as placement of trail alignments away and down-gradient from sensitive resources, as well as erosion-minimizing features such as retaining walls, vegetation buffers, grade reversals, knicks, puddle drains, rolling grade dips, water bars, and pavers shall also be implemented, as appropriate, to protect water quality in such “receiving resources.”
- Mitigation Measure 4.H-9:** Throughout trail construction and maintenance activities, operation of heavy equipment on soft surface trails and unpaved areas shall be avoided when they are wet. During periods that trails are wet, alternative routes for heavy equipment shall be selected.
- Mitigation Measure 4.H-10:** Establish minimum 5 foot vegetation buffers between trails, streams and wetlands prior to trail construction activities, and provide ongoing maintenance of these buffer areas throughout the operational life of the trails. Create these buffers between trails and water resources by establishing riparian and streamside management zones, within which trail influences such as drainage, disturbance and trail width are minimized.
- Mitigation Measure 4.H-11:** In accordance with the trail design guidelines presented in Chapter 6 of the TSMP, avoid steep trail grades in excess of 10 percent where less steep alternative alignments are available and feasible. Where steep trail grades cannot be avoided, trail design features such as climbing turns, stairs/steps, and switchbacks shall be employed to minimize stormwater runoff velocities to appropriate levels of non-erosive flow for the soil type.
- Mitigation Measure 4.H-12:** Runoff control measures shall be implemented in the design of trails as follows:
- a. Maintain minimum trail gradients. Maintain positive surface drainage by means of out-sloped, in-sloped, or crowned sections having cross slopes of 3 percent to 5 percent for soft surfaced trails and 2 percent for hard surfaced trails. The trail surface should be graded to shed water before it can run very far down the trail. MUPs with significant cut-slopes shall be designed to eliminate drainage down or across fill slopes to prevent erosion.
 - b. Maintain the minimum trail width suitable for uses specified. Maintain only the width of trail necessary to support the designated uses.

- c. Avoid long sustained grades that concentrate flows by providing drainage at frequencies appropriate for soils and gradients. Roll grades or undulate the trail profile frequently to disperse water from the trail. Features such as rolling dips and water bars to provide essential drainage relief shall be incorporated into soft surface trail design.
- d. Prevent erosion at outlets of rolling dips and culverts through incorporation of measures that include but are not limited to: armoring of drainage outlets with rock to prevent erosion; spreading of brush or native organic debris in lead-off ditches to slow the velocity of the runoff and facilitate the deposition of sediments.
- e. Install pipes and ditches, including road and trail under-drains (culverts) and associated ditches, when other measures would not be effective, and only when maintenance funds are available to maintain them.
- f. Avoid discharging trail runoff onto fill slopes and unprotected slopes. Fill slopes should be armored where runoff is discharged onto them or the runoff should be conveyed in a down drain to a location where sediments can be deposited and flow infiltrated.
- g. Avoid concentrated runoff from flowing on to trails and paths.

Mitigation Measure 4.H-13: Prior to construction of trails and trails related facilities, complete more detailed engineering study to determine the appropriate design and sizing of storm drain facilities, based on hydrologic data. All culvert sizes shall be prescribed by a qualified engineer based on the size of the contributing watershed and best hydrologic data available.

Mitigation Measure 4.H-14: A Maintenance Plan for proposed trails shall be developed in conjunction with design that specifies the type and frequency of maintenance activities to be employed for the soil types and terrain of the trail or MUP. Trails and MUPS shall be designed to minimize the need for regading. The following provisions shall also apply to trail maintenance activities per the Maintenance Plan:

- o Season of work. Maintenance work that results in disturbed earth should be conducted outside the wet season (typically October 15 to May 1). If necessary, blading shall be done when the trail surface materials are moist, but not dry, to the extent possible.
- o Disposal/storage of excess earth materials. Areas for disposal of excess earth materials generated during maintenance activities shall be designated in the Maintenance Plan. Excess earth materials that must be stored shall be covered with plastic or a thick layer of wood chips.

Mitigation Measure 4.H-15: Areas of disturbed earth shall be seeded with native plant materials and mulched as soon as possible after disturbance. Also refer to Mitigation Measure 4.A-3, in Section 4.A, *Aesthetics and Visual Resources*, of this EIR. Wood chips shall not be used where improved drainage facilities are located, that could become clogged.

Mitigation Measure 4.H-16: In parking areas, avoid grades in excess of 5 percent where possible. Design of all parking areas shall adhere to the following:

- a. Design Parking areas to minimize concentration of runoff.
- b. Maintain the smallest paved area feasible to meet parking requirements.
- c. Install sand/oil separators to collect and contain pollutants from runoff from parking areas.
- d. Install infiltrators and oil/water separators to collect initial runoff from parking lots.
- e. Connect parking areas to existing storm drainage systems or install level spreaders. If necessary drainage outlets shall be armored with rock to prevent erosion. Brush or native organic debris can be spread in lead-off ditches to slow the velocity of the runoff and facilitate the deposition of sediments.
- f. Avoid discharging runoff onto fill slopes and unprotected slopes. Fill slopes receiving discharge shall be armored, or runoff shall be conveyed in a down drain to a location where sediments can be deposited and flow infiltrated.
- g. Parking areas shall be designed in accordance with the Town's drainage design manual, and sited so as to avoid water courses and adverse effects wetlands or water quality.

Mitigation Measure 4.H-17: At bathroom/restroom sites, areas that collect roof drainage shall be designed to be erosion resistant. Avoid conditions that allow runoff from roof to cause initiation of erosion. Runoff from roofs shall be directed to non erodible surfaces. Avoid discharging runoff onto fill slopes and unprotected slopes.

4. CUMULATIVE IMPACTS

4.H-4 Cumulative impacts occurring as a result of the build-out of the Project in combination with related projects within the Town or surrounding National Forest lands are expected to be reduced to less than significant levels with the implementation of the requirements of the Town of Mammoth Lakes 2005 Storm Drain Master Plan; and applicable SWPPP and SUSMP as required under State and federal regulations.

The project combined with cumulative projects may increase hydrology and water quality impacts. However, project-by-project analysis of hydrology and water quality impacts and compliance with State and federal regulatory requirements, as well as the requirements of the Town of Mammoth Lakes 2005 SDWP, USFS guidance documents, and other regulations including the MOU between the Town of Mammoth Lakes and the LRWQCB, where applicable, would ensure that potentially significant cumulative impacts regarding hydrology and water quality would be reduced to a less than significant level.

5. LEVEL OF SIGNIFICANCE AFTER MITIGATION

With the implementation of existing regulations and recommended mitigation measures, impacts to water quality, impacts relative to hydrology and surface water runoff, and impacts related to FEMA designated 100-year flood zones would be reduced to a less than significant level.