



Draft

Stormwater Resources Plan
December 12, 2017



Lake Tahoe, NV

P.O. Box 1760

Zephyr Cove, NV 89448



Town of Mammoth Lakes

P.O. Box 1609

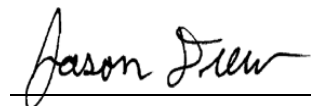
Mammoth Lakes, CA 93546

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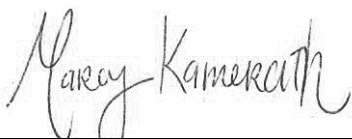
DRAFT

Prepared for
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

NCE Project No.: 220.14.25



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Acronyms & Abbreviations

BLM	Bureau of Land Management
BMP	Best Management Practice
CASQA	California Stormwater Quality Association
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGP	Construction General Permit
CIP	Capital Improvement Program
CWA	Clean Water Act
DAC	Disadvantaged Community
DWR	California Department of Water Resources
E&O	Education and Outreach
EPA	United States Environmental Protection Agency
GDB	Geodatabase
GI	Green Infrastructure
GIS	Geographic Information System
IGP	Industrial General Permit
IRWMP	Integrated Regional Water Management Plan
LADWP	Los Angeles Department of Water and Power
LID	Low Impact Development
LRWQCB	Lahontan Regional Water Quality Control Board
MCWD	Mammoth Community Water District
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation District
O&M	Operations and Maintenance
ROW	Right of Way
RWQCB	Regional Water Quality Control Board
SMARTS	Storm Water Multiple Application and Report Tracking System
SMP	Town of Mammoth Lakes Stormwater Master Plan
State Water Board	State Water Resources Control Board
SWRP	Stormwater Resource Plan
USACE	United States Army Corps of Engineers
USFS	United States Forest Service

Introduction

This Stormwater Resource Plan (SWRP) was developed to identify, prioritize, and quantify the benefits of projects that address stormwater issues in the Mammoth Lakes area. In 2014, California voters approved the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Prop 1). Prop 1 provides approximately \$200 million in grant funding for multi-benefit storm water management projects. Before Prop 1 was passed, Senate Bill (SB) 985 entitled the Stormwater Resource Planning Act (SB 985) added sections to the Water Code requiring a SWRP be developed in order to be eligible to receive grants from a bond act approved after January 1, 2014. The SB 985 requirement to develop a SWRP is directed at public agencies. Public agencies, nonprofit organizations, public utilities, state and federally recognized Indian tribes, and mutual water companies can apply for grant funding if the project is included in a SWRP. A SWRP must address Water Code requirements and be developed in accordance with the State Water Board's Storm Water Resource Plan Guidelines in order for projects to be eligible for state bond funding (**Figure 1**). The State Water Resources Control Board (State Water Board) adopted the final Storm Water Resource Plan Guidelines and the Proposition 1 (Prop 1) SWGP Guidelines on December 15, 2015.



Figure 1. The Town developed a SWRP to be eligible for bond funding

The guidelines require that a SWRP must include a prioritized list of stormwater management projects, and each project must have multiple and quantifiable benefits. A SWRP must also be submitted to the Inyo-Mono integrated regional water management (IRWM) group for incorporation into their Integrated Regional Water Management Plans (IRWMP). After consultation with the Inyo-Mono IRWM, the Town provided its own funding to develop this SWRP, which builds from previous planning efforts in order to meet Water Code and the State Board guidelines. The SWRP was completed in coordination with the IRWM, stakeholders, and public participation.

Stormwater in the Mammoth Lakes Area

Stormwater and urban runoff management are key issues in the Inyo-Mono region and particularly within the Town of Mammoth Lakes. Both the Inyo Mono IRWMP and Town of Mammoth Lakes Stormwater Master Plan (SMP) identify that key stormwater management issues in the region exist within the Town of Mammoth Lakes (Town). The Mammoth Lakes area receives some of the highest levels of precipitation in the region, primarily as snowfall. Much of the Town was developed before drainage standards were in place thus most of the existing storm drain infrastructure is inadequate leading to flooding, drainage, and erosion problems throughout the Town and in downstream areas (**Figure 2**).

The Town, recognizing the critical need to address stormwater, has invested significant efforts in stormwater planning through the 2005 Storm Drain Master Plan Update; 2008 Erosion, Drainage and Flood Control Recommendations Report; 2008 Master Facilities Plan; and the 2015 Stormwater Master Plan. The approval of Prop 1 provides potential funding for multi-benefit stormwater projects identified in the Town's previous planning efforts.

Document Organization

This SWRP is organized as Sections A through F, to follow the main sections identified in the SWRP guidelines:

- **Section A** describes watershed characteristics and displays this information in maps.
- **Section B** describes the process to include stakeholders in development of the SWRP.
- **Section C and D** contains the methods and results to identify, prioritize and quantify the benefits of stormwater projects, including the rationale for selecting the benefits and metrics.
- **Section E** describes the process to update the SWRP in the future.
- **Section F** describes the opportunities provided for public participation during development of the SWRP and processes to provide public participation during implementation.



Figure 2. Flooding in Mammoth Lakes

Section A: Description of SWRP Watersheds (Section VI.A i of Guidelines)

The SWRP Planning region is approximately 171 square miles comprised of four 12-digit Hydrologic Unit Code (HUC) watersheds, which intersect the Town of Mammoth Lakes' municipal boundary:

- 180901020202 – Hot Creek Owens River – Dry Creek
- 180901020205 – Hot Creek Owens River – Hot Creek
- 180901020207 – Hot Creek Owens River – Convict Creek
- 180901020204 – Hot Creek Owens River – Mammoth Creek

This SWRP planning region was selected in order to meet SWRP requirements and to focus on high-priority stormwater issues in the Town and surrounding region (**Figure 3**).

The SWRP guidelines require watershed designations follow United States Geological Services (USGS) Hydrologic Unit Codes (HUC), CalWater designation, or be consistent with local IRWM watersheds. The SWRP watersheds are based on USGS designations and are contained within part of the IRWM planning region.

The SWRP region crosses multiple jurisdictions to support regional planning processes. The region contains public, private, and federal lands including the Town of Mammoth Lakes, Mammoth Mountain Ski Area (MMSA), Mammoth Community Water District (MCWD) service area, and Mono County. The SWRP watersheds are headwater tributaries to the Owens River and Crowley Lake, which ultimately provide water to the Los Angeles Aqueduct (LAA). The MCWD and Los Angeles Department of Water and Power (LADWP) are under a Settlement Agreement with conditions on water use and distribution in a portion of the SWRP region.

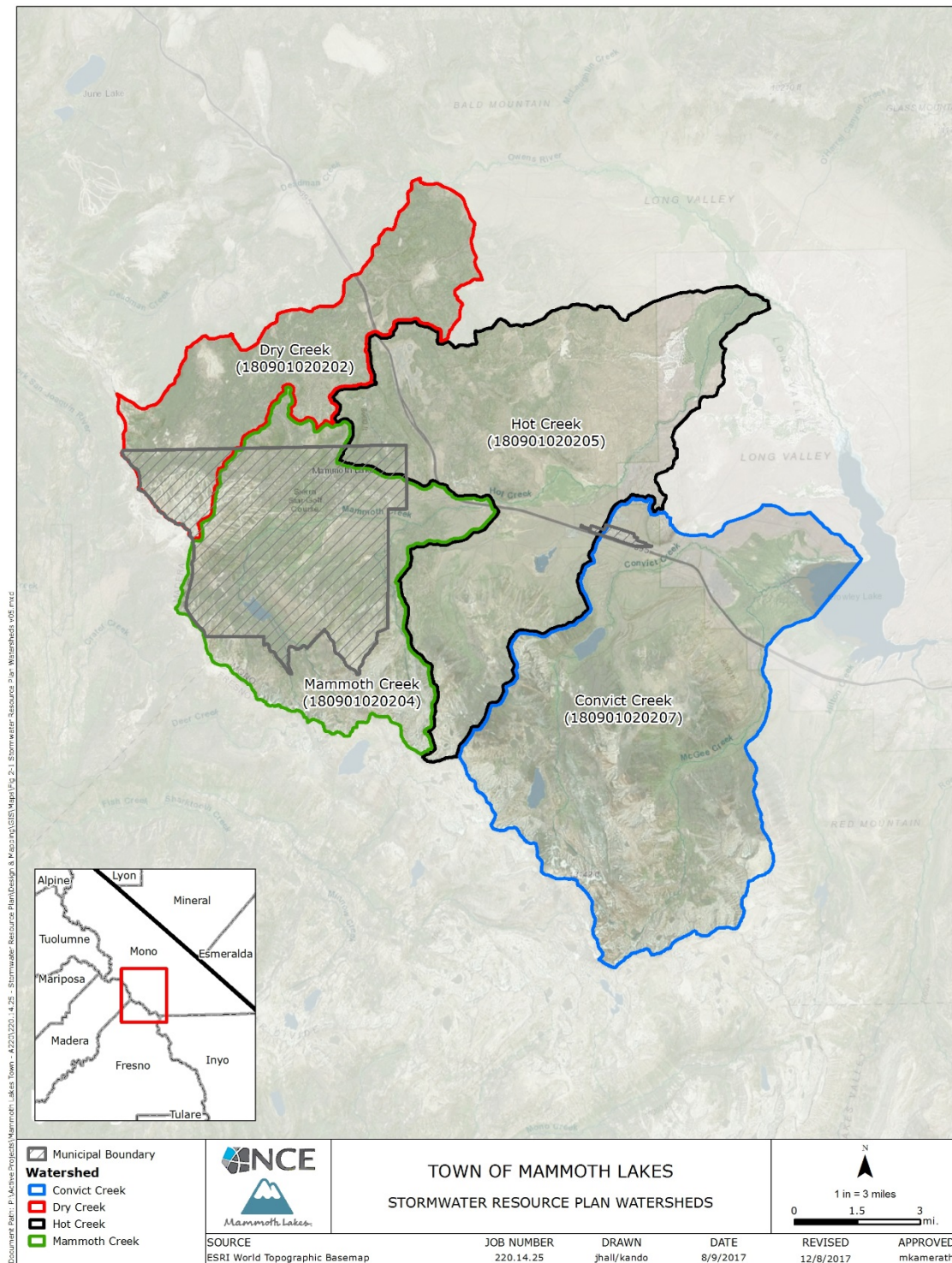


Figure 3. SWRP region and watersheds

Watershed Boundaries (Section VI.A ii)

The 12 digit-HUC watersheds and internal boundaries within them are illustrated in **Figures 3 through 7**. A majority of lands are owned by the United States Forest Service, followed by LADWP, Bureau of Land Management (BLM), public and private land in the Town of Mammoth Lakes, tribal land (Hot Creek watershed), and other federal lands (**Figure 4**). The MCWD's service area lies entirely within the 24 square mile Town of Mammoth Lakes' municipal boundary (**Figure 5**).

Surface and Groundwater Resources (Section VI.A iv)

Dry, Mammoth, Hot, and Convict Creeks are headwater drainages primarily fed by snowmelt and groundwater. Originating on the eastern slope of the Sierra Nevada Mountains, the creeks flow east into the Owens River and Crowley Lake. In middle and lower reaches, these four creeks are perennial waters with small ephemeral and intermittent tributaries. These creeks are important surface water resources and critical recreational assets for the region.

Two groundwater basins occur in the SWRP region, the Mammoth groundwater basin underlies a majority of the Town and extends beyond the Town to approximately the eastern border of the Hot Creek watershed. A portion of the Long Valley groundwater basin occurs on the eastern extent of the SWRP region within Hot Creek and Convict Creek watersheds (**Figure 6**).

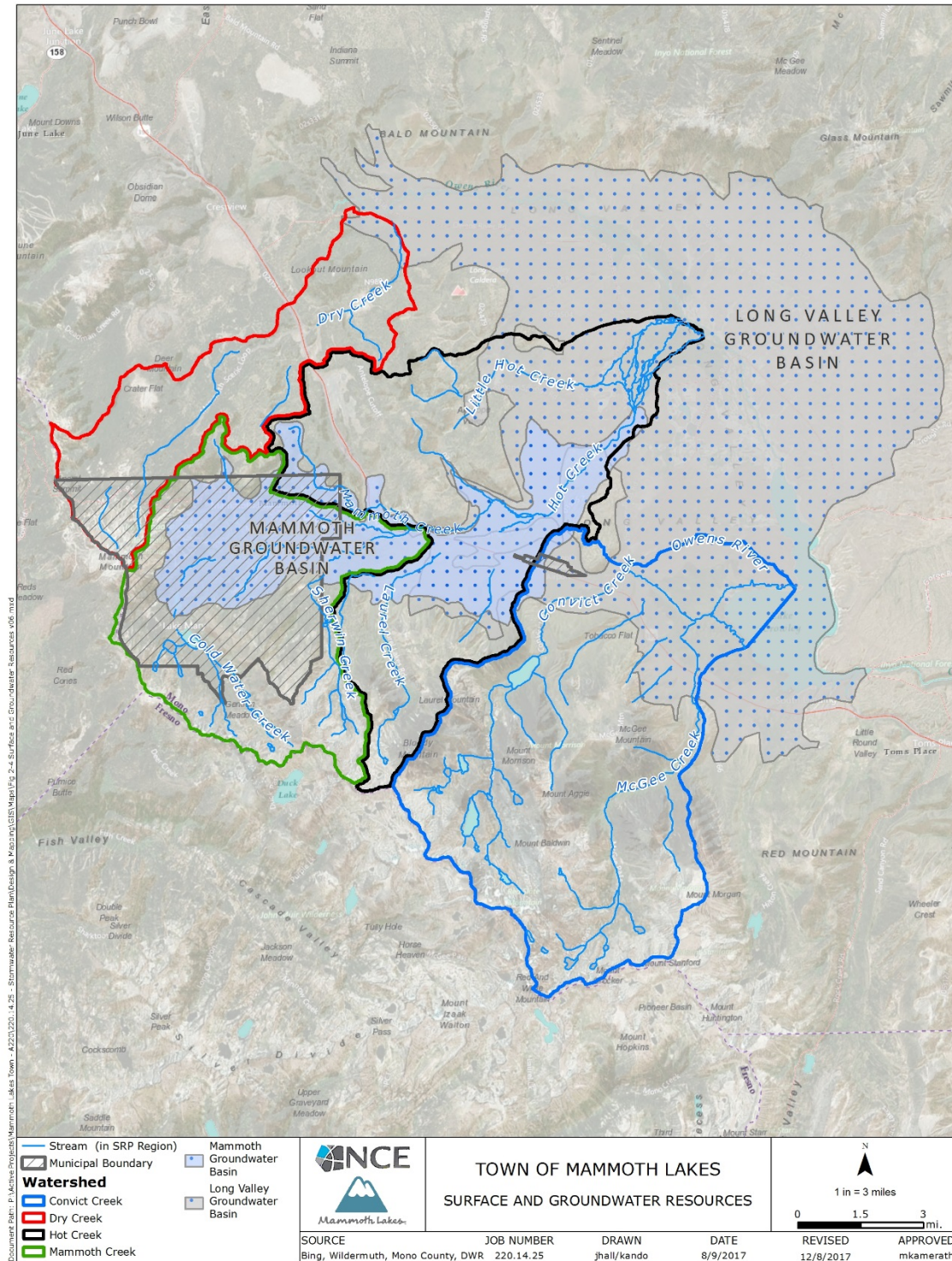


Figure 4. Surface and groundwater resources in the SWRP region

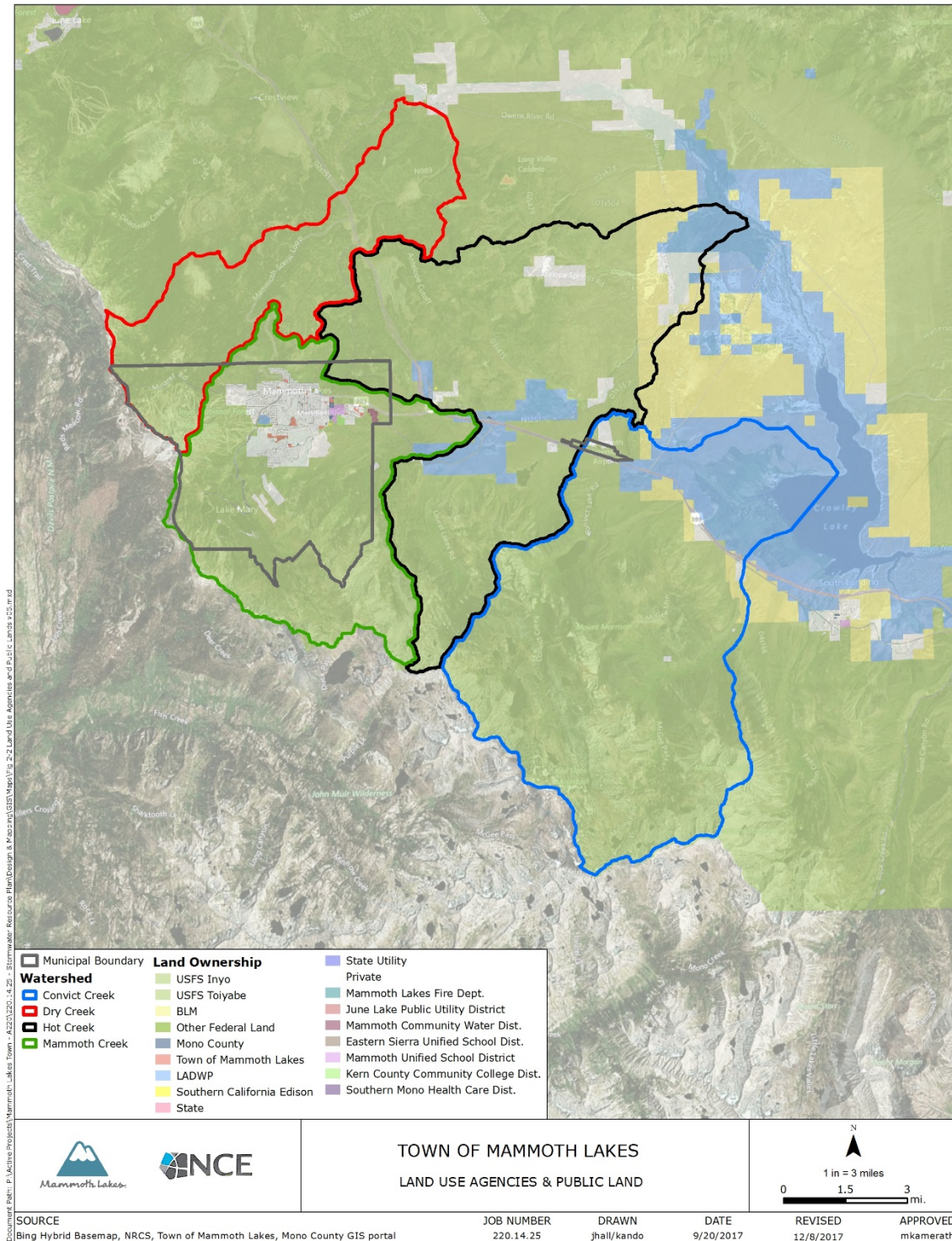


Figure 5. Land use agencies and land ownership in the SWRP region

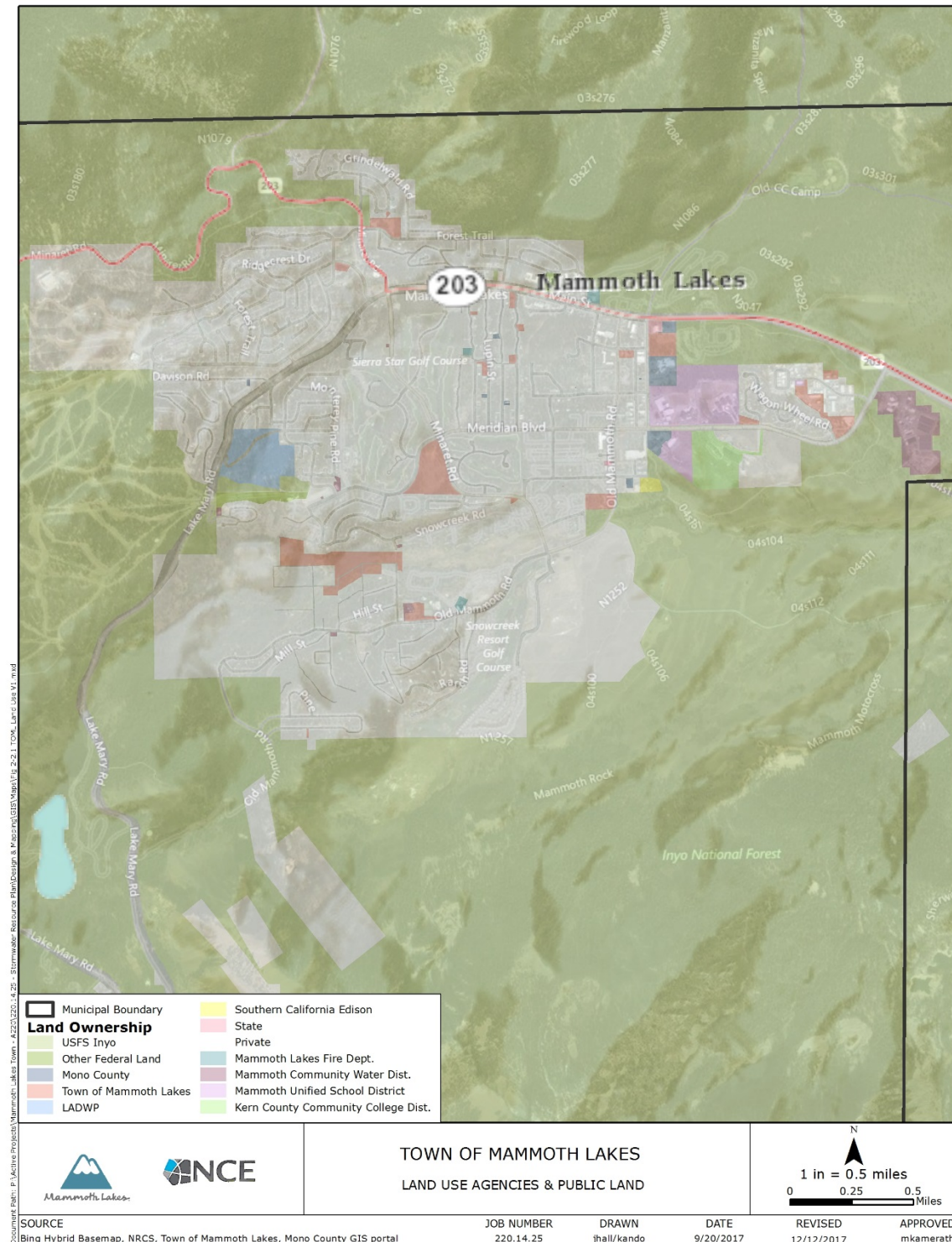


Figure 6. Land use agencies and ownership in the Town

Water Quality Priorities (Section VI.A iii)

Water Quality Priorities can be identified through state and federal required reporting, water quality standards, and local priorities. SWRP guidelines suggest water quality priorities be based on, at a minimum, applicable Total Maximum Daily Loads (TMDLs) and waters listed as impaired on the Clean Water Act 303d list. There are no TMDLs in the SWRP planning region. **Table 1** summarizes impaired waters within the SWRP region from the 2010 303(d) list. Some segments of Mammoth Creek are listed for metals and total dissolved solids. Studies have indicated high concentration of metals and total dissolved solids originate from natural sources due to the geology in the region (IRWMP, Section 2.5). Thus water quality priorities with respect to stormwater management are more focused on reducing sediment, oils, grease, and other pollutants associated with urban runoff (**Figure 7**).



Figure 7. Excess sediment loads from stormwater runoff

Beneficial Uses are a component of Clean Water Act (CWA) water quality standards and are another indicator of water quality priorities. Beneficial uses are designated in the Lahontan Basin Plan. **Table 2** summarizes beneficial uses for Dry, Mammoth, Hot, and Convict Creeks and indicates a priority to support stream health and water quality to sustain coldwater trout fisheries. Sediment is not listed as a cause of impairment for these streams, however, managing and minimizing excess sediment loads is a key water quality priority in order to protect the recreational and ecological value of coldwater fisheries. Excess sediment can cause siltation and loss of habitat, and can contribute to down cutting and excessive erosion in these creeks. Stormwater runoff is one of the prime contributors of sediment loads in the SWRP region, and addressing this load is a key water quality priority.

Table 1. Summary of impaired waters in SWRP region

Waterbody	Waterbody ID	Watershed	Estimated Size Affected	Pollutant
Mammoth Creek (Headwaters to Twin Lakes outlet)	CAR6031005120080 816103626	18090102	5 miles	Total Dissolved Solids
Mammoth Creek (Old Mammoth Road to Highway 395)	CAR6031005320080 816102036	18090102	4 miles	Manganese
Mammoth Creek (Old Mammoth Road to Highway 395)	CAR6031005320080 816102036	18090102	4 miles	Mercury
Mammoth Creek (Old Mammoth Road to Highway 395)	CAR6031005320080 816102036	18090102	4 miles	Total Dissolved Solids
Mammoth Creek (Twin Lakes outlet to Old Mammoth Road)	CAR6031005120080 816102743	18090102	3 miles	Manganese
Mammoth Creek (Twin Lakes outlet to Old Mammoth Road)	CAR6031005120080 816102743	18090102	3 miles	Mercury
Mammoth Creek, unnamed tributary (confluence is near Old Mammoth Rd)	CAR6031005120080 630162428	18090102	2 miles	Arsenic
Mammoth Creek, unnamed tributary (confluence is near Old Mammoth Rd)	CAR6031005120080 630162428	18090102	2 miles	Mercury

Table 2. Summary of beneficial uses in SWRP region

Water	Beneficial Uses ¹																					Receiving Water	
	MUN	ARG	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	WARM	COLD	SAL	WILD	BIOL	RARE	MIGR	SPWN	WQE		FLD
Dry Creek	✓					✓			✓	✓	✓			✓		✓				✓			Owens River
Mammoth Creek	✓	✓			✓	✓			✓	✓	✓			✓		✓		✓	✓	✓			Owens River
Hot Creek	✓	✓		✓	✓				✓	✓	✓	✓		✓		✓		✓	✓	✓			Owens River
Convict Creek	✓	✓			✓	✓			✓	✓	✓			✓		✓				✓			Crowley Lake

¹Beneficial uses and acronyms are further defined at:

http://www.waterboards.ca.gov/lafronton/water_issues/programs/basin_plan/docs/ch2_beneficialuses.pdf

Water Providers (Section VI.A v)

The MCWD supplies potable and non-potable water in the region (**Figure 8**). The primary demand for water supply in the SWRP region comes from the Town of Mammoth Lakes and LADWP. MCWD's service area lies entirely within the 24-square mile Town of Mammoth Lakes' municipal boundary. Most of the 3,640-acre (5.7 square mile) service area is within the much smaller, approximately 4 square miles, Town's Urban Growth Boundary. MCWD currently serves about 15,932 people, including visitor population (MCWD 2015 UWMP, page ES-2). MCWD estimates the following demands for potable water (MCWD 2015 UWMP, Page ES-3):

- 2010: 2,169 acre-feet
- 2015: 1,546 acre-feet
- 2020: 1,860 acre-feet
- 2025: 2,173 acre-feet
- 2030: 2,630 acre-feet
- 2035: 2,944 acre-feet

All of MCWD's water supply is in the Mammoth Basin. Water sources include surface water, groundwater, recycled water, and reserves from water conservation (MCWD 2015 UWMP, Page 6-1). In 2015 the source and volume of water supply was 1,673 acre-feet from groundwater, 47 acre-feet from surface water, and 110 acre-feet from recycled water. By 2035 projected water supply includes 1,743 acre-feet from surface water, 1,353 acre-feet from groundwater, and 448 acre-feet recycled water, and 220 acre-feet raw water (MCWD 2015 UWMP, Page 6-11).

In 2015 the entire water demand for Mammoth was 1,796 acre-feet. Of that 1,686 acre-feet was potable and raw water, and 110 acre-feet was recycled water. The anticipated water demand for 2035 will be 3,719 acre-feet, with 3,271 acre-feet potable and raw water, and 448 acre-feet recycled water (MCWD 2015 UWMP, Page 4-2). Per a settlement agreement with LADPW, MCWD's extractions, diversions, and

deliveries cannot exceed 4,387 acre-feet annually. According to MCWD's Urban Water Management Plan the Town will need about 3,400 acre-feet of water per year by 2020 and 4,200 by 2030. (IRWMP, Section 2.4.5).

Native Habitats (Section VI.A. vi)

Native habitats and open space can provide opportunities for capture and re-use projects that will also enhance public space or existing habitat. A majority of parks and open space are within the Town of Mammoth Lakes. Native aquatic habitats are abundant given the relatively low amount of urbanized areas in the SWRP region. Alpine, sub-alpine lakes, and montane meadows occur in the higher elevations on the western edge of the SWRP region. Freshwater emergent, and riverine wetlands dot the landscape in areas that are adjacent to or near surface waters (**Figure 9**).

Opportunities exist within the Town to implement stormwater projects to improve downstream native habitats by capturing and reducing sediment loads, or by creating new habitat as part of infiltration basins or revegetation of disturbed or eroded areas.

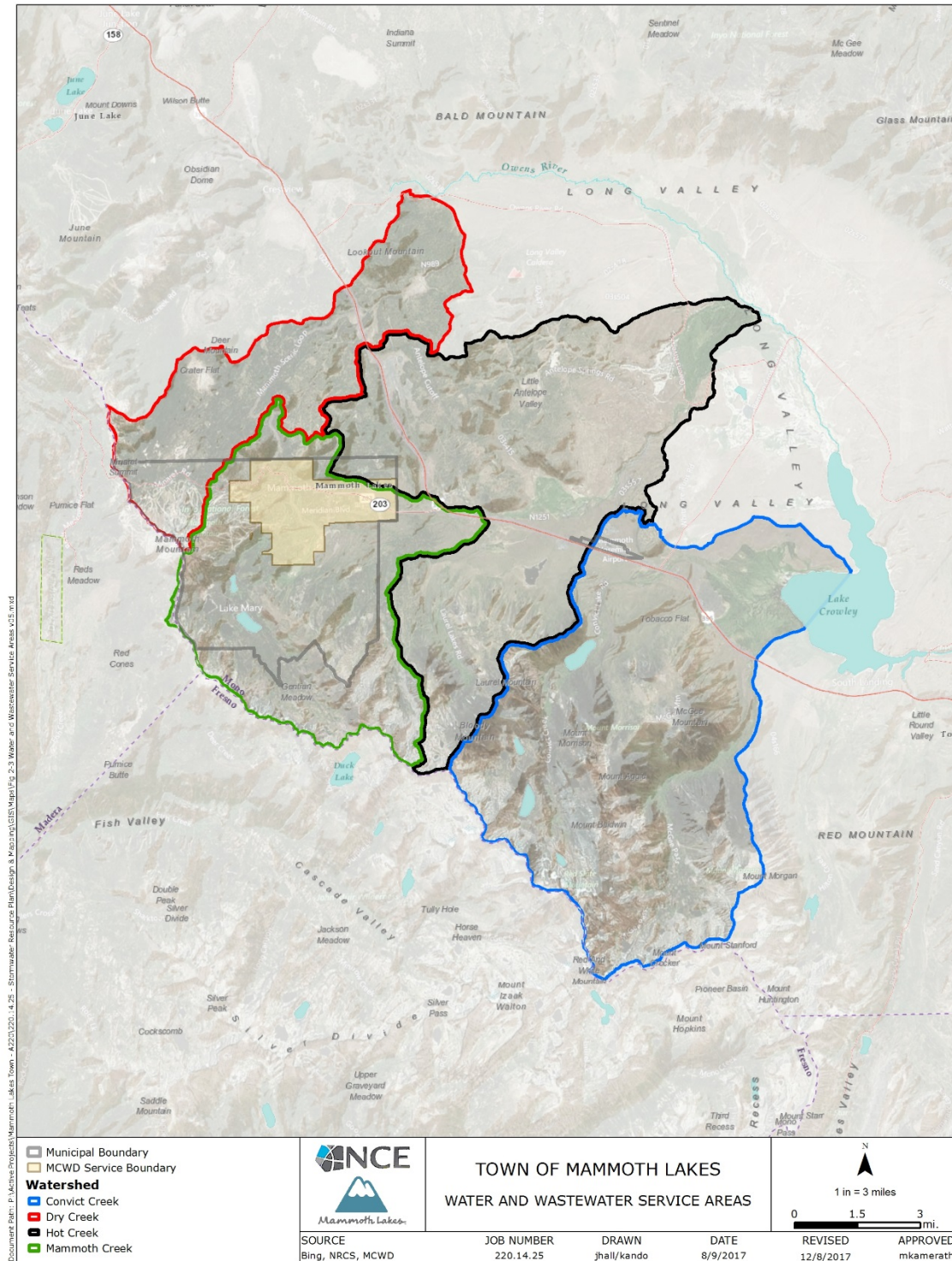


Figure 8. Water service areas in SWRP region



Watershed Processes (Section VI.A vii)

Hydrologic processes are highly variable in nature and extremely complex in urbanized watersheds. Precipitation rates and volumes vary significantly with location and elevation. Precipitation occurs in the form of drizzle, rain, sleet, snow, and hail, however, rain and rain-on-snow events typically produce the highest rates of surface runoff. Surface runoff occurs when precipitation exceeds storage and infiltration capacities. Land surfaces that initially produce little to no surface runoff produce rapidly increasing surface runoff volumes as soils become saturated. Undeveloped land has a higher capacity to absorb and store precipitation than constructed impervious features, such as roads, rooftops, and parking lots. Thus urbanization has a big impact on the rate and volume of stormwater runoff primarily through:

- the conversion of vegetated or pervious surfaces to impervious surfaces; and
- the development of drainage systems that connect impervious surfaces to streams and other water bodies resulting in increased rates of runoff, eliminating storage and infiltration that occurs along natural drainage paths.

Runoff before Development

One inch of rain on an undeveloped area the size of a typical parking lot generates about 80,000 gallons of runoff



Runoff after Development

One inch of rain on a developed area of the same size generates about 220,000 gallons of runoff



Stormwater runoff is also a source of pollutant loads that can impact habitat and water quality. As runoff travels over impervious and bare areas, pollutants like sediment, oil, grease, and bacteria are transported. These pollutants are discharged to receiving waters and can impact habitats and water quality. For example, high sediment loads, which are known to occur in stormwater runoff from the Town and surrounding area, can clog culverts and cause flooding and erosion. High sediment loads can also impact highly valued coldwater fisheries by clogging fish gills and covering up spawning habitat.

Activities contributing to stormwater pollution in the SWRP region include snow removal, runoff over large impervious

areas, erosion from bare areas (e.g., cut slopes, driveways, etc.), atmospheric deposition, and construction and development activities.

Urbanization impacts natural watershed processes by increasing impervious cover. As impervious cover increases, stormwater runoff rates, volumes, and pollutant loads also increase. Addressing stormwater

close to its source with measures that mimic natural hydrologic processes can reduce impacts of urbanization on water resources. The Town has identified projects in previous plans as well as this SWRP which help to address impacts of urbanization through stormwater capture and re-use.

Water Quality Compliance

The SWRP must demonstrate consistency with applicable TMDLs, National Pollutant Discharge Elimination System (NPDES), and Waste Discharge Requirements (WDRs) (Water Code § 10562 (b)). There are no TMDL's in the SWRP region. NPDES permits and WDRs were identified through a search in the State Water Board's Storm Water Multiple Application and Report Tracking System (SMARTS). The following NPDES permits and WDR's exist within the region:

- **NPDES Permits.** There are three types of NPDES permits for stormwater discharges, Construction, Industrial, and Municipal. Of these, the Construction General Permit (2012-0006-DWQ) and Industrial General Permit (2014-0057-DWQ) are applicable NPDES permits in the Town. Construction activities disturbing one acre of land or more must obtain coverage under the CGP and adhere to its conditions throughout the duration of the project. Similarly, stormwater runoff from industrial activities occurring within the SWRP region and that meet the Standard Industrial Code (SIC) would require the site operator to obtain coverage. Based on a review in SMARTs and available information, there are no operations within the SWRP region covered by the IGP permit. The Town has a population less than 10,000 and is thus not regulated by the Phase II Municipal Separate Storm Sewer System (MS4) permit. No individual NPDES permits were identified in previous planning documents, by Town staff, and a review of SMARTs did not produce any active or reporting individual NPDES permits.
- **Waste Discharge Requirements.** Three WDR's exist in the SWRP region, one of which is applicable to stormwater. The Mammoth Mountain Ski Area (MMSA) is regulated, along with U.S. Forest Service (USFS) as a co-permittee, by a WDR for stormwater and erosion from an approximately 3,200 acre area in the MMSA tributary to Mammoth Creek (WDID 6B268070001). The WDR sets limits on pollutants in receiving waters, which include area groundwater, Dry Creek and Mammoth Creek. The WDR establishes Best Management Practices (BMPs) for implementation to prevent and reduce erosion and pollutants in runoff. The MMSA must also conduct monitoring and reporting per the WDR. The MMSA and USFS must submit an Annual Workplan for review by the Lahontan Regional Water Quality Control Board (LRWQCB) identifying projects ready for construction. a

Projects implemented under the SWRP would be consistent with existing NPDES and WDR requirements through ongoing regulatory processes. The CGP requires a Stormwater Pollution Prevention Plan (SWPPP) be developed and requires BMPs be installed and maintained to prevent discharge of pollutants in stormwater runoff. Projects included in the current SWRP would disturb over one acre of land in order to be constructed and therefore would require a CGP be developed. No projects in the SWRP would require coverage under the IGP. No projects exist within the area regulated by the MMSA WDR. However, if projects are identified by MMSA in future updates to the SWRP, these projects may be subject to the MMSA's WDR requirements .

Section B: Organization, Coordination, and Collaboration (Section VI.B)

Development and implementation of the SWRP includes relevant stakeholders and agencies who play a role in stormwater or water resource management in the region in order to build on previous planning efforts and to address high priority stormwater issues in the region.

Inyo Mono IRMWP (Section VI.B.i)

The Town worked closely with the IRWM to initiate and develop the SWRP. The Town provided its own funding to complete the SWRP, and coordinated with stakeholders and the IRWM to participate in its development. The Town will continue to coordinate with agencies during SWRP implementation as outlined in Section E of this document (Section VI.B. viii).

The IRWM planning process was initiated in response to Proposition 84 in 2008. The Inyo-Mono IRWM Program consists of a main group (RWMG), an advisory committee (Administrative Committee), paid staff, and ad-hoc working committees. The RWMG is the largest and most inclusive group and is the main decision-making body for the Inyo-Mono IRWM planning and implementation processes. The RWMG is a non-binding, non-regulatory, voluntary entity governed by a Memorandum of Understanding (MOU). The RWMG Meetings are held approximately once per month and are open to organizations participating in the IRWMP and the public. The IRWM region covers an area much larger than the region for this SWRP (IRWMP, Section 1.3.1 and 1.3.3).

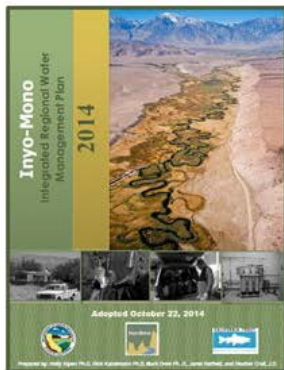
Relationship to Existing Plans and Local Requirements (Section VI.B.vii)

The SWRP is informed by and/or builds primarily from these existing planning efforts (**Figure 10**):

- **Inyo-Mono IRWMP, 2014.** The SWRP builds from this plan by helping to address urban and stormwater runoff management issues. It also uses relevant information on water resource issues and from a GIS library to describe and map watershed characteristics.
- **Town of Mammoth Lakes SMP, 2015.** Developed to address critical stormwater needs identified in the IRWMP. The SMP assessed critical stormwater issues in the town and developed a stormwater Capital Improvement Program (CIP). Preliminary project data were collected in the field and used in this SWRP to prioritize and quantify multi-benefit projects.
- **MCWD Urban Water Management Plan, 2017.** Provides water supply and demand information, which may be relevant if future iterations of the SWRP include projects with water supply benefits, or require coordination with MCWD.

Section VI.B.vii of the SWRP guidelines requires a description of how the SWRP is related to existing ordinances or local agency programs. Local ordinances related to stormwater and dry weather runoff management include Town Municipal Code Chapter 12.08 for Land Clearing, Earthwork, and Drainage Facilities. The code sets conditions for grading and earthwork in order to protect water quality and public

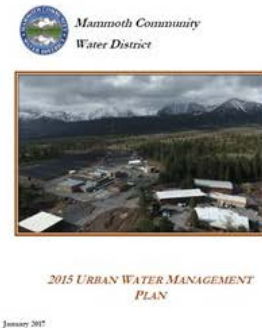
welfare. Projects implemented as part of the SWRP would be subject to these requirements. Mono County regulates and safeguards groundwater extraction and transfer in Chapter 20.01 Groundwater Transfer. This ordinance also prohibits groundwater transfers for use outside of Mono County. Projects in the current SWRP do not involve groundwater transfer or extraction. However, the groundwater transfer ordinance highlights the importance of safeguarding groundwater supply and quality, and illustrates how multi-benefit stormwater projects which capture and infiltrate stormwater runoff are consistent with local agency goals to protect groundwater quality.



IRWMP
2014



Town SMP
2015



MCWD UWMP
2017

Figure 10. The SWRP builds from existing planning efforts

Stakeholder Coordination (Section VI.B.ii and iii)

The Town conducted outreach through stakeholder meetings, e-mail, and phone calls, identifying stakeholders and non-profit agencies in coordination with the IRWM. Stakeholders included the public, representatives from local, state and federal agencies, industry contacts within the planning area, and non-profit groups involved with resource planning or watershed management within the planning area. An e-mail invitation to participate in a stakeholder meeting held on August 21, 2017 was sent to over 30 individuals representing 21 agencies and organizations, listed below:

L.A. Department of Water and Power
Big Pine Paiute Tribe
Bishop Paiute Tribe
Bureau of Land Management
Bridgeport Indian Colony
California Trout
Caltrans
City of Bishop
City of Ridgecrest
Eastern Kern Resource Conservation District
Indian Wells Valley Water District

Inyo County
Kern County
LRWQCB
Lone Pine Paiute-Shoshone Reservation
Mammoth Community Water District
Mammoth Mountain Ski Area
Mono County
Owens Valley Indian Water Commission
Residents and Land Owners
U.S. Department of Agriculture - Bishop
U.S. Forest Service

Several of the organizations above have jurisdictions outside of the SWRP region, but due to involvement in the IRWMP, were invited to increase awareness of this latest stormwater planning effort, and keep outreach efforts broad. For this SWRP, key stakeholders include agencies and organizations within the SWRP region, which manage stormwater infrastructure, municipal water sources, or who manage stormwater and dry weather runoff issues. These include the IRWM, USFS, Mono County, L.A. Department of Water and Power, MCWD, MMSA, and Caltrans.

A stakeholder meeting was held at the Town of Mammoth Lakes Offices to discuss the purpose of an SWRP, discuss multi-benefit projects and SWRP requirements, and provide an opportunity for



Figure 11. Timeline for stakeholder input suggested at August 21, 2017 meeting

stakeholders to provide feedback and identify potential projects (**Figure 11**). Stakeholder feedback provided at the meeting included general support to develop the SWRP, recognition that critical stormwater needs in the region exist within the Town, and that projects identified in the Town's SMP were still relevant. The stakeholders did not suggest additional projects at the meeting.

The Town followed up by phone or e-mail directly with stakeholders who did not attend the meeting to create awareness that the SWRP was being developed, and to solicit input and feedback on potential projects by August 28,

2017. One stakeholder suggested a concept similar to mitigation banking, however the idea, was concept-level only and did not have project-specific data to reliably quantify benefits related to stormwater management. Again, stakeholders did not identify additional projects beyond what is already included in Town's SMP for consideration in the SWRP.

A follow up stakeholder and public meeting is scheduled to occur on January 8th, 2018 to provide an overview of the Draft SWRP, highlight SWRP projects, and provide an opportunity for comment and feedback.

Public Engagement and Community Participation (Section VI. B.iv)

The public engagement and community participation in development of the SWRP is described in Section F of this document.

Agency Decisions and Governance (Section VI.B.v and vi)

Agency decisions required for SWRP implementation will depend on the proposed projects and which agency jurisdictions are affected. No other decisions, other than agency approvals through permits and environmental review were identified in order to be able to implement the SWRP. Projects subject to ministerial or discretionary approval will be subject to environmental review under California Environmental Quality Act (CEQA). Projects with impacts to water resources or protected species habitats could require permit approvals from resource agencies. Projects that require clearing, grading, or land disturbance must be consistent with local codes and ordinances.

No additional governance mechanisms are required between the Town or stakeholder agencies to implement the SWRP. A MOU between the Town and LRWQB requires the Town to implement actions to minimize stormwater runoff impacts. The USFS and MMSA are co-permittees on a WDR administered by LRWQCB to control activities from the MMSA impacting stormwater runoff discharges to Dry and Mammoth Creek watersheds. An MOU exists between agencies involved in the RWMG to implement the IRWM and facilitate water resources management in the IRWMP region, which contains the SWRP region. The Town, along with several other organizations, is a signatory and active participant on the RWMG MOU.

Section C and D: Quantitative Methods for Multi-Benefit Project Identification and Prioritization (Section VI.C and D)

Identification of Projects Using Quantitative Measures (Section VI.C.1)

Water Code § 10562 requires an SWRP to identify:

- 1) Opportunities to augment local water supply through groundwater recharge or storage for beneficial use;
- 2) Opportunities for source control of pollutants due to stormwater or dry weather runoff, onsite and local infiltration, and use of storm water and dry weather runoff;
- 3) Projects to reestablish natural water drainage treatment and infiltration systems, or mimic natural system functions;
- 4) Opportunities to develop, restore, or enhance habitat and open space through storm water and dry weather runoff management;
- 5) Opportunities to use existing publicly owned lands and easements for capture and re-use of storm water and dry weather runoff;
- 6) Design criteria and best management practices (BMPs) to prevent stormwater or dry weather pollution through reduced impermeability, increased water storage for beneficial use, increased groundwater through infiltration, and support low-impact development; and
- 7) Activities generating or contributing to the pollution of stormwater or dry weather runoff or that impair effective beneficial reuse.

Project Identification

To identify potential projects for inclusion in this SWRP, the Town reviewed existing planning documents performed outreach to a variety of stakeholders. Numerous water resource and stormwater planning efforts were completed in the SWRP area and the following planning documents were reviewed to identify opportunities for stormwater and dry weather runoff projects:

- Inyo-Mono IRWMP (October 2014)
- Town of Mammoth Lakes SMP (June 2015)
- MCWD 2015 Urban Water Management Plan (January 2017)
- Groundwater Management Plan for the Mammoth Basin Watershed (July 2005)

The only projects included in these four documents relevant to the SWRP guidelines and Water Code §10562 are from the Town of Mammoth Lakes SMP and are summarized in **Table 3**. Candidate SWRP projects were identified if the project could provide multiple benefits within the benefit categories listed in the SWRP guidelines, and reliable data exist to quantify project benefits.

During development of the SWRP, the outcome of stakeholder outreach, described in Section B of this document reinforced that all of the key stormwater resource issues and opportunities in the region are primarily in urbanized areas within the Town of Mammoth Lakes. Based on stakeholder feedback, no additional projects were identified beyond those summarized in **Table 3**.

Table 3. Proposed CIP Projects in the SMP

Project Number	Project Title
1	Upper John Muir Slope Protection
2	Upper John Muir Storm Drain
3	Lower John Muir Slope Protection
4	Lower John Muir Storm Drain
5	Davison Road Storm Drain
6	Majestic Pines Storm Drain
7	Forest Trail Slope Protection
8	Forest Trail Storm Drain

Project Prioritization

Water Code § 10565 subd. (b) and Section VI.C and D of the SWRP guidelines require quantitative methods be used to identify and prioritize opportunities for stormwater and dry weather runoff capture projects. Projects in **Table 3** represent the opportunities to address key stormwater needs in the SWRP region and were strategically identified and previously prioritized as part of the development of the Town's SMP. It is important to note that projects 1 and 2, and projects 3 and 4 and projects 7 and 8 are simply phases of three larger projects. For the purposes of the SMP, the source control element was separated from the capture and treatment element of each project to allow a more manageable total construction cost and fit the number of construction days into one season. For this SWRP, they have each been respectively rolled back up into a larger project to capture achievable multi-benefits. With this change, the SWRP updated project list is shown in **Table 4**.

Table 4. Initial project list for the SWRP

Project ID	Project Title
A	Upper John Muir Slope Protection and Storm Drain
B	Lower John Muir Slope Protection and Storm Drain
C	Davison Road Storm Drain
D	Majestic Pines Storm Drain
E	Forest Trail Slope Protection and Storm Drain

To meet the intent of the SWRP, the above projects were prioritized by a quantitative process to meet SWRP guidelines and Water Code § 10562 requirements. As part of the development of the Town's SMP, all projects were already sited to maximize opportunities on publicly owned lands or within Town's right of way or easement areas, so no criterion was used to represent land ownership in the current effort. Points for each criterion are summarized in **Table 5**. The score of potential projects was summed to prioritize projects.

Table 5. Prioritization criteria for potential SWRP projects

Prioritization Criteria	Points		
	0	1	2
Location in Drainage	Lower	Middle	Top
Average Slope	<5%	5%-20%	Over 20%
Includes Sediment Source Control	No		Yes
Includes Green Infrastructure	No	Infiltration/Retention or source control	Infiltration/Retention and source control

Points were summed to prioritize and identify top projects in the SWRP. Results of the prioritization process are shown in **Table 6**.

Table 6. Project prioritization results

Prioritization Criteria	Project				
	A Upper John Muir	B Lower John Muir	C Davison Road	D Majestic Pines	E Forest Trail
Location in Drainage	2	2	2	1	1
Slope	2	2	2	1	1
Includes Sediment Source Control	2	2	0	0	2
Includes Green Infrastructure	2	2	2	2	2
Total Score	8	8	6	4	6

Projects A, B, and C were selected as priority projects to further quantify multi-benefits. Project C and E had the same priority ranking, however project C was selected over E because it is contiguous with A and B and thus would provide a greater impact in addressing critical stormwater needs.

Integrated Metrics-Based Analysis (Section VI.C.2.b)

SWRP guidelines identify five benefit categories for the metric-based evaluation of multiple project benefits including: water supply, water quality, flood management, environmental, and community benefits Water Code Section §10562, subd.(b)(2). This SWRP does not include metrics for the water supply category because although water supply is important it is not a priority concern for the Town and outreach to partners within the region did not identify any water supply priorities or projects. Therefore, prioritizing projects based on water supply benefits did not provide any value to this current SWRP. The decision to omit water supply metrics was verified with the Town and partners and all parties agreed water supply should not be included in this SWRP. As a result, this SWRP considers the remaining four benefit categories including water quality, flood management, environmental, and community benefits from implemented projects.

In order to meet SWRP guidelines and water code requirements, each project must address at least two of the benefit categories identified in the guidelines. Thus metrics among different benefit categories were calculated for priority projects. Metrics quantified by project for each benefit category are shown in **Table 7**. Metrics were calculated using standard hydrologic calculations and best available estimates from preliminary project information.

Benefit Categories and Quantifying Metrics

Metrics were selected to be representative of key stormwater and dry weather runoff issues identified in previous planning efforts. The six metrics and the methods used to quantify them are shown in Figure 12



and the results from quantification are listed in **Table 7**. Data available from the Town SMP in the Stormwater Capital Improvement Program component were used to quantify metrics. These data were field verified and quality controlled during development of the SMP (**Figure 12**).

Figure 12. Field identification of stormwater projects



Figure 13. Metrics used to quantify benefits of SWRP projects

Table 7. Metrics-based analysis results

Benefit Category	Metric Type	Metric Unit	Metric Quantification		
			A Upper John Muir	B Lower John Muir	C Davison Road
Water Quality	Pollutant load reduction	Volume Water Treated (Acre-feet per year)	6.83	7.8	15.2
	Reestablished natural water drainage and/or treatment	Effective Impervious Cover reduced (Acres)	5.95	6.8	13.25
Flood Management	Decrease flood risk	Volume Water Treated (Acre-feet per year)	6.83	7.8	15.2
Environmental	Increased green space	Revegetation (sq. ft. area revegetated)	30,000	43,500	10,300
Community	Economic Investment	Total Project Cost Estimate	\$3,217,600	\$2,875,400	\$2,062,900
	Job Creation	Temporary or permanent jobs created (FTE)	3.5	3.5	2.3

Summary of Benefits Obtained by the SWRP

- Water quality benefits.** Projects with water quality benefits would result in cumulative treatment of approximately 30 acre-feet of runoff on an annual basis. Infiltration and detention basins remove sediment and adsorbed pollutants through settling and infiltration. The proposed projects would reduce the sediment load discharged to the Town's storm drain system and downstream receiving waters to improve water quality. In addition, over 25 acres of impervious cover would be routed to stormwater treatment facilities that mimic natural hydrologic processes and provide on-site treatment for stormwater.
- Flood management benefits.** Projects with flood management benefits would reduce stormwater runoff volumes by approximately 30 acre-feet on an annual basis through collection and

infiltration. The water volume reductions would occur in higher elevations and would reduce localized flooding occurring downstream.

- **Environmental benefits.** Implementation of SWRP projects would install over 83,000 square feet of green space in currently bare areas causing or contributing to erosion, flooding, and drainage problems. Increasing green space improves habitat quality and helps prevent habitat loss caused by significant erosion.
- **Community benefits.** The Town would invest approximately 8.2 million dollars in the community to construct the SWRP projects. Project construction would employ up to 10 FTE, providing temporary construction jobs.

Information and Data Management (Section VI.C.3)

See Section E for description of information and data management.

Section E: Plan Implementation Strategy and Project Scheduling (Section VI. E)

Section E describes resources available to implement the SWRP, a proposed timeline for its implementation, and methods used to track implementation.

Resources for Plan Implementation (Section VI. E. 1)

Water code §10562(d)(8) requires that a SWRP identify resources committed to implement the SWRP. The Town has committed its own resources to develop this SWRP and intends to pursue round two implementation grant funding to construct SWRP projects. The Town may reach out to stakeholders to form partnerships or secure matching funds from other organizations in order to secure funding for construction of projects and to secure operations and maintenance agreements, if needed.

Funding needs and sources

The preliminary cost to construct projects in this current SWRP is \$8.2 million dollars. Additional costs will be required to design, plan and permit projects. Local funding for stormwater and all infrastructure needs is supported by the general fund. The Town does not have a dedicated source of revenue for stormwater infrastructure or management. The Town plans to rely on state or federal grant funding to implement these projects. Operations and maintenance of SWRP projects within the Town would be led by the Town and coordinated with other land owners or agencies as necessary.



Figure 14. Detention basin currently maintained by Town

Schedule for Plan financing and project implementation

The general timeline in **Figure 15** will be repeated in phases to implement SWRP projects, as state bond funds or other sources of local funding become available. The Town plans to prioritize implementation for projects at higher elevations first. Addressing issues in higher elevations reduces erosion and sedimentation in the project area, as well as minimizes downstream flooding.

Implementation (Section VI. E. 2)

Water code §10562(d)(8) & (9) requires a SWRP identify projects and programs to ensure effective SWRP implementation and shall include appropriate decisions support tools and data to support those tools. The Plan shall also identify ordinances or other mechanism necessary for implementation. SWRP

guidelines require additional information regarding timelines, actions, and responsible entities for plan implementation.

Submittal to IRWMP (Section VI.E.2.a)

A draft of the SWRP document will be available for review by the public and IRWM during January 2018. Following review of public comments and discussion with the IRWM, the SWRP will be finalized and submitted to the IRWM in the middle of February 2018 for incorporation into the IRWMP (Section VI.E.2.a).

Actions, Responsible Entities, Schedule and Permits (Section VI.E.2.b, c, e, h, and f)

The Town and IRWM are the lead entities responsible for implementation and adaptation of the SWRP over time. In early 2018, a request for proposals from the State Water Board is anticipated and projects included in a SWRP that meet's SWRP guidelines are eligible to apply for round two of Prop 1 implementation grant funds. A SWRP must be finalized prior to being awarded implementation grant funds from the State Water Board. The lead agency responsible for constructing or administering an SWRP project is responsible for initiating a grant application for state bond funding. The Town, in coordination with interested stakeholders and the IRWM where relevant, would lead the application for round two of Prop 1 implementation grant funds.

Implementation of the SWRP can be implemented in phases, or a project at a time, depending on available funding and staff capacity to administer construction. **Figure 15** summarizes major actions, approximate timeframes, and responsibilities for implementing SWRP projects.

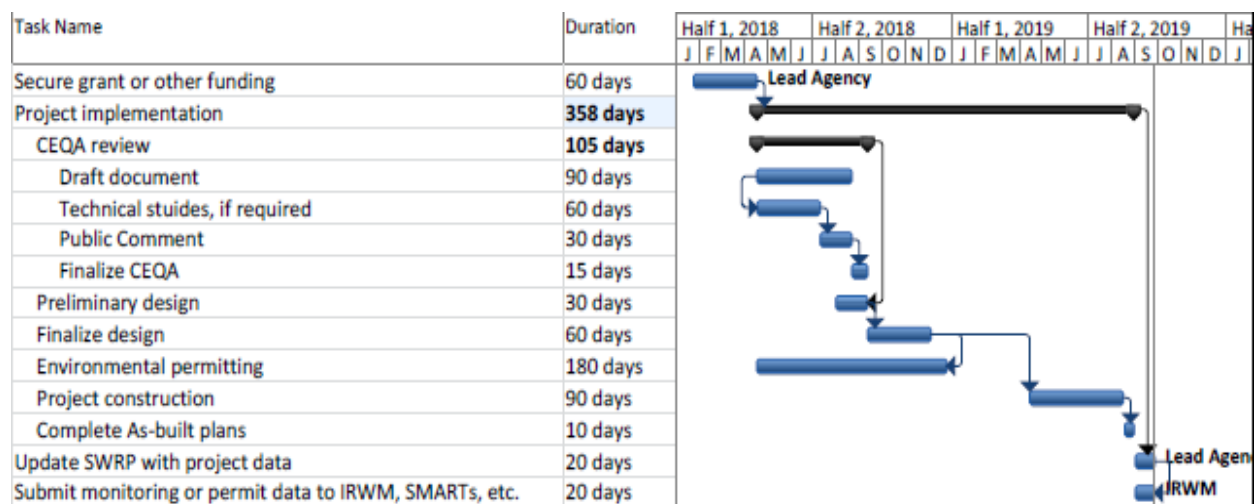


Figure 15. Project implementation schedule

The permitting strategy for each project will vary based on any individual project's temporary or permanent impacts to resources within an agency's jurisdiction. In general, it takes a minimum of 6 months to obtain permits and up to 1.5 years if projects will impact federally-listed species. Common permits required for CIP projects in waterways or near sensitive habitats include:

- California Department of Fish and Wildlife (CDFW) Lake or Streambed Alteration Agreement

- U.S. Army Corps of Engineers (USACE) CWA §404 permit
- LRWQCB CWA §401 Water Quality Certification
- State Water Board CWA §402 CGP
- Town of Mammoth Lakes grading and encroachment permits

Community Participation in SWRP Implementation (Section VI.E.2.d)

As described in Section F of this document, the public will be engaged throughout implementation of the SWRP through CEQA.

Procedures to Track and Update SWRP (Section VI.E.2.e, g)

The Town's involvement in the IRWM RMWG will provide a mechanism to keep stakeholders updated on the implementation status of the SWRP, and also to provide an opportunity to update the SWRP. The SWRP can be updated periodically by either the Town, the IRWM, or interested stakeholders to ensure the SWRP continues to meet stormwater priorities in the region. This process is described further in the adaptive management section of this document.

Adaptive Management (Section VI. E. 3)

The SWRP guidelines require an SWRP to be structured as a living document and adapted over time. Updates would help ensure the SWRP continues to address stormwater priorities and provide benefits to the region. This will ensure the projects on the SWRP are competitive for future state bond funding.

Once every two years, the Town will propose an agenda item for an IRWM RMWG meeting to consider making updates to the SWRP. If the Town and/or IRWM RMWG determine an update to the SWRP is warranted, an IRWM subcommittee will be formed and an update period will begin. The subcommittee lead will send an e-mail to RMWG members and stakeholders to announce an update period for the SWRP. The e-mail will specify a deadline and point of contact for individuals who would like to recommend updates to the SWRP.

The length of the update period should be approximately three months but will vary based on updates to make. During an update period, the following types of updates can be made to the SWRP:

- Add new **metrics**
- Add **water supply benefits**
- Updates to the **project list** to include new projects and completion status on remaining projects
- Re-assignment of **implementer roles and responsibilities**

The entity proposing a change is responsible for providing data required to quantify benefits and also ensure proposed updates are consistent with current SWRP guidelines. The subcommittee should also vet proposed changes to ensure the SWRP supports the goals and addresses critical needs in the SWRP region.

Once changes are proposed, the subcommittee will work with stakeholders to incorporate updates to the SWRP. The updated document will be reviewed by the IRWM coordinator and Town, if necessary. Once updates are finalized at the end of the update period, the revised document will be incorporated into the

IRWMP either by reference and made available on the Town or IRWM website. An updated SWRP will be submitted electronically to the State Water Board for their records.

Implementation Performance Measures (Section VI. E. 4)

Expected outcomes of the plan are summarized in Section C and D of this document. These outcomes can be evaluated by using project data, once a project is completed. Once an SWRP project is constructed, the lead agency for the project will collect relevant data through as-built plans and final bid quantities to track benefits obtained from the project. The benefit metrics can be calculated using the methods summarized in **Figure 13** of this document to verify or update the benefits provided by the completed project. The results can be compared to initial estimates of benefits provided in Table 7 of this SWRP in order to track whether performance measures are met. The lead agency will be responsible for summarizing the benefits obtained by the project and providing a copy of this information to the Town and the IRWM for inclusion in updates to the SWRP, if necessary.

Project implementers can use performance data to identify if operations and maintenance actions require adjustment. For instance, if water quality volumes are being treated as originally estimated, no change may be necessary to the way a project is maintained. Performance data can be provided to stakeholders through e-mail correspondence or through updates to the SWRP.

Section F: Education, Outreach and Public Participation (Section VI. F)

Section F summarizes public education and outreach during development of the SWRP, and what processes exist to support public participation during its implementation.

Public Education and Participation (Section VI.F.i – v, vii)

The SWRP guidelines require public education and participation opportunities are provided when considering technical or policy issues related to development and implementation of the SWRP (Section VI.F.i). The Town held two public meetings during development of the SWRP on August 21, 2017 and January 8th, 2018. The schedule for initial engagement and education dates were scheduled early on in the project and prior to finalization of the SWRP to allow time to process public feedback on the approach

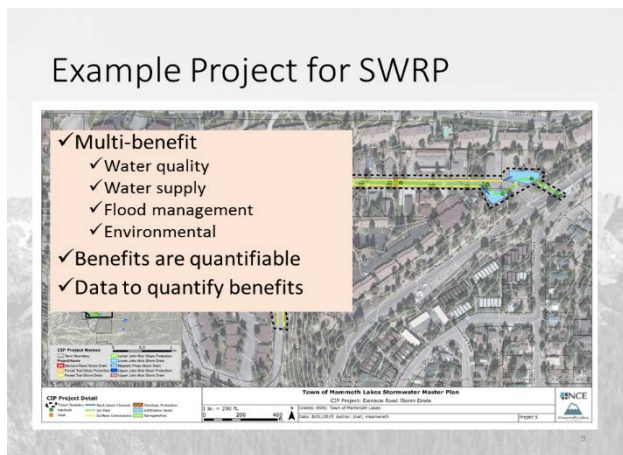


Figure 16. SWRP projects shared at public meeting

and to consider projects proposed by the public. Public meetings were held at Town council chambers and advertised on social media, via-email to stakeholders and the Town paper. For the second public meeting, in addition to notification in the paper, leaders in commercial and industrial stakeholders, nongovernmental organizations, and nonprofit organizations will be contacted directly by phone or e-mail to encourage attendance at the public meeting in January. The IRWMP did not identify any disadvantaged communities (DAC) in the SWRP region so no direct contact was made to a DAC.

The purpose of the first public meeting was to describe the concept of a SWRP, why it is being developed by the Town, and provide examples of proposed projects (Figure 16). No members of the general public attended at the August 21st, 2017 meeting. The purpose of the second public meeting was to provide an overview of the SWRP, review example projects and their benefits, and provide an opportunity for the public to give feedback and input on the SWRP.

CEQA provides a mechanism for public participation during SWRP implementation. Lead agencies implementing SWRP projects would be required to complete environmental review under CEQA. CEQA provides public notification of a project during the planning phase and provides an opportunity to comment on a project and engage in its design.

Environmental Injustice (Section VI.F.vi)

The U.S. Environmental Protection Agency (EPA) has developed a screening tool to identify Environmental Justice concerns (EJSCREEN Maps, Version 2017 accessed at <https://ejscreen.epa.gov/mapper/>) (Figure 17). This tool identifies Environmental and Demographic indicators which indicate where EJ concerns could arise but does not include the capability to identify environmental justice concerns related

specifically to stormwater runoff. The tool was reviewed to help identify whether there are runoff-related environmental justice issues to address.

There are some minority and low income populations within the central part of the Town. This area is prone to flooding due to the high sediment loads coming from high elevation areas with steep slopes and large amounts of bare areas and impervious cover, so there is potential for some runoff related environmental justice issues to occur, though stormwater runoff related issues occur throughout the Town. Still, the SWRP addresses and prioritizes projects in areas that coincide with low income areas and SWRP implementation will help to address runoff related concerns in these locations.

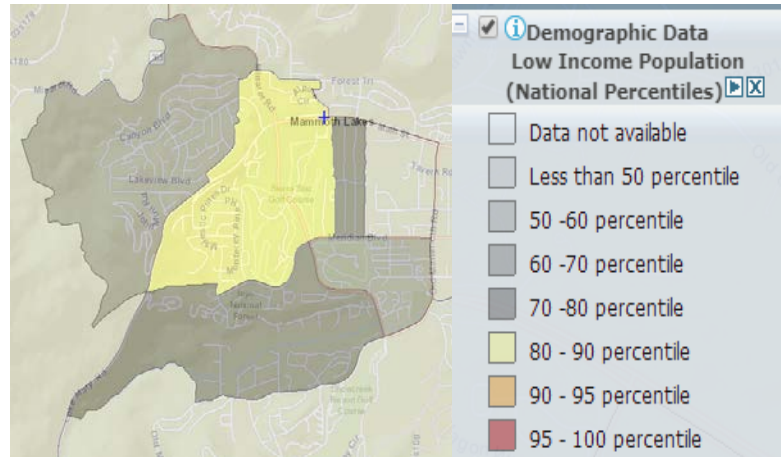


Figure 17. EJSCREEN low income population result (yellow area)

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