

Tahoe Valley South Subbasin (6.5.01) Groundwater Management Plan

MEETING NOTES

Tuesday, July 23rd, 2019 1:30-4:30 p.m.

Location: 1275 Meadow Crest Drive, South Lake Tahoe CA

ATTENDEES:

Ken Payne (El Dorado County Water Agency – via Teleconference); Jason Burke (City of South Lake Tahoe); Nakia Foskett (Lakeside Park Water Co.); Jennifer Lukins (Lukins Brothers Water Co); Dave Patterson (Tahoe Keys Water Co.); Brian Grey (Lahontan Regional Water Quality Control Board); Jason Burke (City of South Lake Tahoe); Michael Conger (Tahoe Regional Planning Agency); Andrea Buxton (Tahoe Resource Conservation District); Shay Navarro (Tahoe Regional Planning Agency); Russ Wigart (El Dorado County Department of Transportation); Christina Boggs-Chavira (California Department of Water Resources-NCRO – via Teleconference); Ivo Bergsohn, P.G., HG (South Tahoe PUD); John Thiel (South Tahoe PUD).

BASIN MANAGEMENT OBJECTIVES:

Ivo opened the meeting with a brief explanation of the workshop objectives.

1. Maintain a sustainable long-term groundwater supply.
2. Maintain and protect groundwater quality.
3. Strengthen collaborative relationships with local water purveyors, governmental agencies, businesses, private property owners and the public.
4. Integrate groundwater quality protection into local land use planning activities.
5. Assess the interaction of water supply activities with environmental conditions.
6. Convene an on-going Stakeholders Advisory Group (SAG) as a forum for future groundwater issues.
7. Conduct technical studies to assess future groundwater needs and issues.
8. Identify and obtain funding for groundwater projects.

WORKSHOP OBJECTIVES

1. Learn about stormwater management in the South Shore Area.
2. Consider groundwater management program activities being planned for the 2019/2020 fiscal year.

Att 1: 2019 SAG Roster Changes

- Welcome
 - Nakia Foskett, Water Systems Manager, Lakeside Mutual Water Company – NEW; and
 - Andrea Buxton, Stormwater Program Manager, Tahoe Resource Conservation District – NEW
- Farewell
 - Dave Peterson, Water Company Manager, TKWC, - LEAVING
- Please review and return with any changes

DISCUSSION

TVS Basin (6-5.01) - Open Forum

Ivo asked if there were any topics outside of the Agenda outline that anyone wanted to discuss now or bring up for another meeting.

Att 2 - 21 Dec 2018 – Meeting Notes – Provided for Your File; On District Web Page

Att 3 – LRWQCB General Order

- Email received from LRWQCB last Wednesday (7/17/2019)

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- LRWQCB is seeking input with regard to proposed changes to a General Order defining the waste discharge requirements for Groundwater Remediation and Disposal of Treated Groundwater to Land.
- LRWQCB is seeking input with respect to a list of amendments that may be added which would broaden the scope of activities that could be permitted under the General Order
- Specifically LRWQCB is seeking input on;
 - Potential impacts that may occur within your jurisdiction in the event of an unauthorized release of the amendments and/or concentration of the constituents of concern above the maximum contaminant level and public health goals. Indicate your most sensitive areas if possible; and
 - Potential impacts associated with extraction and injection of the water to the groundwater basin(s).
- Initial feedback from Stakeholders due tomorrow (7/24/2019)

Lake Tahoe Basin Climate Change Vulnerability Assessment

- CTC awarded SB1 Climate Adaptation Planning Grant through CalTrans (\$359,756) to develop Vulnerability Assessment and Action Plan
- Vulnerability Assessment (In-progress)
 - Potential climate change impacts on
 - Lake Tahoe System (includes Groundwater -Low Elevation)
 - Upland System ((includes Groundwater -High Elevation)
 - Built Environment/Communities
- Action Plan (to-do)
 - Identify Adaptation Measures – measures that benefit multiple resources to bolster Basin's resilience to impacts from Climate Change
- Contacts
 - Dorian Fougères, Chief of Natural Resources, CTC
 - Ben Pogue, Catalyst Environmental Solutions

EDF – email received this morning from the Environmental Defense Fund

- The Groundwater Game;
- Game to facilitate understanding about approaches that may be used when developing Groundwater Sustainability Plans which balance supply and demand within their groundwater basin.

TVS Basin 2018 WY Annual Report (3/18/2019) is on the Groundwater Management Process page of the District's website –

- Normal water year (10/1/2017 – 9/30/2018)
- GW Recharge (37,746 AF)
- GW Production (6,910 AF)
- GW Storage (-8,621 AF); Since 2005 (+49,356 AF)
- GW Levels Above Normal compared to base period (2001 – 2010 WY)

South Y Activity Updates

Former LTLW Off-Site Investigation and Regional Plume Characterization (B. Grey, LRWQCB)

- Brian Grey gave a slide presentation on the progress of investigations being performed by the responsible parties (RP) at the former Lake Tahoe Laundry Works (LTLW) site, including an overview of the Phase 1 and Phase 2 groundwater sampling results, passive vapor survey sampling results and proposed work at the Tucker Basin, Big O Tires site and development of a Remedial Action Plan for the former LTLW site.

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During the presentation Jason Burke questioned LRWQCB's interpretation of the CSLT stormwater system layout as presented for the Tucker Avenue Basin site. (See Attached Presentation).

- Brian also provided an update on the Regional Plume Characterization under the direction of the LRWQCB, using SB445 funds. This included the issuance of more than 200 requests for site history letters to property owners where LRWQCB has reason to believe that PCE had been used on the premises. 114 Responses received, 29 NOVs issued (responses to questionnaires -not received or incomplete). Work will be used to help build inventory for source identification use. LRWQCB Issued a letter to Big O and Hurzel Properties, LLC requesting a work plan for additional site characterization and a completed questionnaire. A questionnaire and Phase 1 report were received from Hurzel Properties. (See Attached Presentation).
- Brian also described up-coming tasks planned for the upcoming field season for the Regional Plume Characterization (RPC). The RPC also includes a vertical conduit (well) survey; non-municipal (private ?) well sampling and evaluation of possible sentry well locations to monitor plume movement. Christina Boggs (DWR) noted that the funding through DWR's Technical Support Services may also be available for installation of sentry wells for this project (See Attached Presentation).

South Y Feasibility Study (I. Bergsohn, STPUD)

- Ivo Bergsohn gave a slide presentation on the progress of the South Y Feasibility Study (FS). This project is being funded, in part, by a Proposition 1 Groundwater Clean-Up Grant administered through the State Water Resources Control Board. The purpose of the FS is to evaluate whether existing and/or new wells can be used to provide hydraulic control and removal of tetrachloroethylene (PCE) from groundwater. Ivo provided a series of tables listing project milestones to illustrate the progress of the FS. A "To-Do" Table was presented listing the major milestones required to complete the FS by the end of 2019. The Interim Remedial Action Plan (RAP) is required to include: a conceptual design for the recommended alternative; a project schedule; and a project financing and governance plan (See Attached Presentation).

Discussion

- S. Navarro- any effort made to look at source control and removal of contaminated soils?
 - South Y FS constraint – efforts undertaken by water purveyors should not overlap with responsibilities of RPs. LRWQCB Is responsible for directing these types of activities (Ivo B.). RPs are under a Clean-Up and Abatement Order to investigate these types of activities (Brian G.).
- D. Peterson – have there ever been borings drilled between TKWC #1 and Lake Tahoe to determine if PCE plume has reached the Lake?
 - Not to my knowledge (Ivo B.)
- R. Wigart – Who is liable for contamination; what are costs of remediation?
 - LRWQCB SB 445 Grant: \$4.5 million; LBWC; \$ 500 – 750 thousand (without future costs for remediation, estimated at about \$2.15 million capital cost, does not include O&M); TKWC; \$ 750 thousand (to-date?); STPUD Prop 1 Grant; \$ 500 thousand.
 - How are water purveyors paying for this? LBWC- dedicated line-item surcharges on customer water bills: purchase water, contaminated water treatment, water quality testing, and litigation. LRWQCB has been working to attain state-grant funding since 2014 (Jennifer Lukins); TKWC – paid through Homeowner Association fees.
 - LRWQCB must make determination on source(s) and liability.

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Stormwater Management

Ivo Bergsohn gave a brief introduction introducing this topic to SAG. Program managers from the City, EDC, TRCD and TRPA were invited to provide brief presentations describing the primary objectives of their respective programs to provide an understanding of the scope of stormwater management within our groundwater basin. The SAG was encouraged to consider the connections between storm water management and groundwater protection; and whether storm water systems should be considered within the basin's groundwater management plan.

City of South Lake Tahoe Stormwater Management Program (J. Burke, CSLT)

- Jason Burke provided a slide presentation describing the City's Storm Water Management Program, including an overview of the regulatory drivers necessitating storm water management by the CSLT, including NPDES requirements under LRWQCB Orders, Municipal Stormwater Permit Requirements (MS4 Permit); Lake Tahoe TMDL) and Regional Stormwater Monitoring Program (RSWMP). Program elements include Construction- ensure no pollutants in construction site runoff; Commercial/Industrial – ensure businesses do not pollute water; Municipal - ensure no pollutants in runoff from City operations; Illicit Discharge Elimination; New Development/Redevelopment – require infiltration BMPs to satisfy TRPA mandate; Education and Outreach. The Lake Tahoe TMDL Report shows that the greatest majority of Total Suspended Solids (TSS) (aka Fine Sediment) and Dissolved Nitrogen (N) occur in stormwater runoff from primary roads. Pollutant Load Reduction Model (PLRM) uses the runoff concentrations to estimate pollutant loads from differing land use categories. The PLRM is then used to identify high pollutant load areas in order to develop plans for the construction of stormwater systems to reduce pollutant loads to Lake Tahoe. CSLT stormwater system constructed since the mid-1980s, most recent improvements constructed within past 20 years (grant-funded). Challenge(s): 1) many areas within City limits do not have stormwater infrastructure or drainage necessary for effective stormwater management; i.e., Al Tahoe area- no utility easements for drainage; 2) Aging Infrastructure (stormwater pipe failures – potential pathways for groundwater contamination); and 3) Aging Equipment (See Attached Presentation)..

El Dorado County Storm Water Management Program (R. Wigart, EDC-DOT)

- Russ Wigart provided a slide presentation describing the County's Storm Water Management Program, including an overview of the regulatory drivers necessitating storm water management within the Lake Tahoe Basin; environmental concerns within the Lake Tahoe Basin; and impacts of development and urbanization on stormwater run-off (greater runoff volume, higher peak discharge). Lake Clarity: 72% of Lake Clarity loss is due to fine sediment; 73% of fine sediment is clay size fraction (0.5 – 1.0 microns size), particles dissolve at ~0.4 microns. Lake clarity natural cycle - improves during lake level highstands; declines during droughts (periods of low lake levels). Lake Tahoe TMDL objective- Reduce Fine Sediment and Pollutants (FSP) by 65%. Storm Water is managed to meet this objective using Lake Clarity Crediting Program and Pollutant Load Reduction Model (PLRM). Baseline loading surface runoff: 500 - 1,300 ac-ft/yr. Surface runoff control measures– Infiltrate Urban runoff; subsurface drain systems; residential BMPs; rain gardens/micro basins. Costs for non-compliance \$10,000/day plus \$10/gallon over 1,000 gallons. County Efforts: Staff training/education – water quality and road damage prevention; beet-juice based deicing solutions; pavement maintenance (stormwater concentrations increase as paving deteriorates (Paving Condition Index (PCI)) (See Attached Presentation).

Regional Storm Water Monitoring Program (A. Buxton, TRCD)

- Andrea Buxton provided a slide presentation with an overview of the Tahoe Resource Conservation District's Regional Stormwater Monitoring Program (RSWMP), including need for a regional program, benefits of collaboration and partnership with multiple City and County agencies and program funding sources. TRCD maintains a current network of 12 stormwater monitoring sites and 6 weather stations

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distributed around the perimeter of Lake Tahoe. Collected water quality samples are analyzed for fine sediment particles (FSP), Total Nitrogen (TN) and total phosphorus (TP). Automated samplers are used to collect stormwater quality samples and monitor continuous flow and selected weather data (precipitation, temperature). The collected data are analyzed for status and trends. Status: precipitation amounts, runoff volumes, and pollutant loads for a given water year. Trend analysis used to compare year-to-year changes in annual volumes and pollutant loads. Volumes and pollutant loads are normalized against precipitation amounts for comparison purposes. Currently, TRCD dataset includes 5 – 6 water years of stormwater monitoring data. Data is reported annually to LRWQCB and NDEP. Inspection of average annual pollutant concentrations and runoff volumes shows that Upper Truckee Catchment area tends to have high concentrations of both TN and TP as most runoff originates from US Highway 50. However, this catchment is small, therefore the runoff volumes are small, and the resulting loads are small. In contrast, Tahoe Valley which has a very large catchment size, and even though TN and TP pollutant concentrations are low, loads are very high from this catchment because of the large runoff volumes. Runoff volume has the greatest influence on pollutant loads – focus on reducing runoff volumes using infiltration whenever possible to reduce pollutant loads. Infiltration also addresses capture of fine sediment particles which are typically not removed using stormwater cartridge filtration systems. PLRM used to model urban catchments. Model uses 18-year average precipitation event (1989 – 2006). Difficult to compare PLRM predicted values with TRCD field data because of differences between modeled and actual runoff volumes. However, field data has been used to update load reductions used for cartridge filters in the PLRM model (See Attached Presentation).

TRPA Stormwater Management Program Overview (S. Navarro, TRPA)

- Shay Navarro provided a slide presentation with an overview of the Tahoe Regional Planning Agency (TRPA) Stormwater Management Program, including a description of TRPA's Planning Framework, primary objectives for the stormwater management program, how TRPA collaborates with other agencies to implement stormwater management in the South Shore area; and how stormwater is considered within TRPA's source water protection program. TRPA's program is focused on managing stormwater on private parcels with existing uses within the Lake Tahoe Basin. Stormwater Management part of EIP Division, one of many water quality programs including TMDL water quality thresholds, lake clarity and groundwater protection. Primary objectives: Maintain and Restore Lake Clarity; Encourage use of BMP Practice Requirements; and Implement BMP Action Plan recommendations. Coordination occurs through participation in: EIP Working Group's Stormwater Quality Improvement Committee and Parcel BMP Working Groups; coordination with local agencies to help set annual stormwater program priorities; and partnering for grant funding opportunities. Stormwater is considered under TRPA Code Standards: prevention of potential contaminating activities within defined source water protection areas; discharge limits to groundwater – where direct connection between surface water and groundwater; BMPs require pre-treatment of runoff prior to infiltration in high groundwater areas (1-foot separation requirement), can be waived if connected to a regional treatment system. BMP Action Plan- restricts use of infiltration on parcels with known incidences of shallow soil contamination (See Attached Presentation).

Discussion (Group)

- Are there actions that should be completed that would benefit stormwater management and groundwater protection within the South Shore Area?
- Tucker Ave. Basin- Basin was created after LTLW site was active. At the time LTLW was active, it was an open stormwater ditch. Raley's Center has a stormwater treatment system; system should not be infiltrating when shallow soil contamination may be present.

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- 2nd Nature Study – study was focused on occurrence of VOCs in stormwater discharges. Major finding was concentrations of VOCs were at trace or non-detect levels. Trace concentrations of low molecular weight VOCs suggest that volatile fraction was removed prior to entrainment in stormwater runoff and collection and infiltration through stormwater retention basins.
- Given the need for infiltration of stormwater and groundwater quality concerns with respect to source water protection, should a section on stormwater management be added to the Groundwater Management Plan (Ivo B.)? For example, TRPA expressed need for identifying parcels with known incidences of shallow soil contamination. These data are readily available through GeoTracker. Maps showing the occurrence of shallow soil contamination could then be created for inclusion in the GWMP. This could help prevent infiltration of shallow soil contamination to groundwater benefitting stormwater and groundwater managers.
- Are there water quality parameters that could be added to TRCD's stormwater sampling protocol that would benefit groundwater protection (Ivo B.)? Source control was a likely cause of many of the groundwater contamination problems that we currently see in the groundwater basin. A stringent stormwater sampling program focusing on toxic substances in characterizing first-flush storm events was completed in California around 2001 - 2004, as part of the California Toxics Rule. Sampling results brought back limited information on pollutant sources of toxic substances (R. Wigart). This should be revisited before considering another similar type of sampling effort. Agreed, better approach may be to focus on education and outreach to prevent illicit discharges to stormwater systems (Ivo B.).
- Jason Burke – Would a pre-treatment system prevented the groundwater contamination which occurred due to illicit discharges to the stormwater system from the former LTLW site? Important to recognize that the purity of the dry cleaning solvents used at the former LTLW site was likely very high (95% +). Also proper waste handling and disposal practices were not well established. At these high concentrations, very small amounts of PCE can result in large groundwater contamination problems (Ivo B.).
- S. Navarro- It is important that parcels with known shallow soil contamination are identified. Agreed, mapping of these sites should be performed.
- Tucker Ave Basin- Basin is currently used for infiltration. Funding should be sought to address shallow soil contamination at this site so that continued use as a stormwater retention basin does not exacerbate the South Y Groundwater Contamination problem (Ivo B.). Source removal did occur at former LTLW and Hurzel Properties; however the source removal occurred many years after the release which contributed to the groundwater contamination (B. Grey).

2019/2020 Groundwater Management Projects (I. Bergsohn, STPUD)

- DWR approved the District's 2014 Groundwater Management Plan (GWMP) as an Alternative to a GSP. District will be able to continue to manage groundwater basin under this plan in accordance with SGMA; and amend the plan as needed to address changing groundwater conditions and/or groundwater concerns. District will need to address Recommended Actions identified by DWR in the first 5-year update of the GWMP (due January 2022)
- South Y FS- Technical proposal for implementation will be contingent on the recommended alternative proposed in the FS.
- Complete Survey of Private Well Owners (Phase II).

MEETING ADJOURNED

SIGN-IN SHEET

South Tahoe Public Utility District

**TAHOE VALLEY SOUTH BASIN (6-5.01)
GROUNDWATER MANAGEMENT PLAN**

**2019 STAKEHOLDERS ADVISORY GROUP
WORKSHOP No. 1**

Tuesday, July 23rd, 2019
(1:30 PM - 4:30 PM)

NAME	AFFILIATION	PHONE	EMAIL
Shay Navarro	TRPA	775-589-5282	snavarro@trpa.org
Ivo BERGSOHN	So. Tahoe PUD	530-543-6204	IBERGSOHN@STPD.DIST.CA.US
Jason Burke	CSLT	530-542-6038	jburke@cityofsl.us
Andrea Buxton	Tahoe RCD	530-412-0456	abuxton@tahoevalleyrcd.org
Brian Gray	Lake Tahoe WTB	530-542-5421	brian.gray@waterboards.ca.gov
Jenn Wilkins	UPM	530-541-2006	jennifer@wilkinswater.com
NAKIA FOSKETT	LAKESIDE PARK	530-307-3180	nakia@laketahoe.com
JOHN TITTEL	So. Tahoe PUD	530-543-6201	JTITTEL@STPD.DIST.CA.US
MICHAEL CONVERSE	TRPA	775-589-5221	MCONVERSE@trpa.org
KEW PAYNE (ONLINE)	EDCWA	530-621-5392	KEW.PAYNE@EDC.GOV.US
CHRISTINA BOGGS (ONLINE)	DWR	916-376-9623	CHRISTINA.BOGGS@WATER.CA.GOV
DAVE PETERSON	TKWC	530-542-6451	DPETERSON@TAHOEKEYSPOA.ORG
RUSS WILBERT	EDC-DOT	530-573-7924	ROSSELL.WILBERT@EDC.GOV.US





AGENDA

DATE	Tuesday, July 23 rd , 1:30 PM – 4:30 PM
LOCATION	South Tahoe Public Utility District Board Room, 1275 Meadow Crest Drive, South Lake Tahoe, CA
STAKEHOLDER ADVISORY GROUP LIST	Ken Payne, P.E., (El Dorado County Water Agency); Robert Lauritzen, P.G., Karen Bender, REHS, RD (El Dorado County -EMD); Jason Burke (City of South Lake Tahoe); Scott Carroll (CA Tahoe Conservancy); Andrea Buxton (Tahoe Resource Conservation District; Brian Grey, P.G. (Lahontan Regional Water Quality Control Board); Paul Nielsen (TRPA); Joey Keely, Nicole Bringolf (USFS – LTBMU); Nakia Foskett (Lakeside Park Water Co.); Jennifer Lukins (Lukins Brothers Water Co); Dave Peterson. (Tahoe Keys Water Co.); Harold Singer (Community Rate Payer); John Thiel, PE and Ivo Bergsohn, P.G., HG (South Tahoe PUD)
MEETING HOST	Ivo Bergsohn (South Tahoe PUD)
GO TO MEETING	https://global.gotomeeting.com/join/521639373 Call-In: 1(669) 224-3412; Access Code: 521-639-373

BASIN MANAGEMENT OBJECTIVES (BMO)

1. Maintain a sustainable long-term groundwater supply.
2. Maintain and protect groundwater quality.
3. Strengthen collaborative relationships with local water purveyors, governmental agencies, businesses, private property owners and the public.
4. Integrate groundwater quality protection into local land use planning activities.
5. Assess the interaction of water supply activities with environmental conditions.
6. Convene an on-going Stakeholders Advisory Group (SAG) as a forum for future groundwater issues.
7. Conduct technical studies to assess future groundwater needs and issues.
8. Identify and obtain funding for groundwater projects.

WORKSHOP OBJECTIVES

OBJECTIVES

1. Learn about stormwater management in the South Shore Area.
2. Consider groundwater management program activities being planned for the 2019/2020 fiscal year.

SEE REVERSE FOR AGENDA



AGENDA

Time	Description	
1:30	Welcome and Self-Introductions	Round Robin
1:40	TVS Basin (6-5.01) - Open Forum Opportunity for members to briefly raise topics within the subject matter of the SAG and not listed on the Agenda.	Round Robin
1:50	South Y Activity Updates <ul style="list-style-type: none"> • LRWQCB Regional Plume Characterization (J. Brooks, LRWQCB) • former LTLW Off-Site Investigation (B. Grey, LRWQCB) • South Y Feasibility Study (I. Bergsohn, STPUD) • Discussion 	
2:30	Break	
2:40	Stormwater Management <ul style="list-style-type: none"> • City of South Lake Tahoe (J. Burke) • El Dorado County (Russ Wigart) • Tahoe Resource Conservation District (Andrea Buxton) • Tahoe Regional Planning Agency (Shay Navarro) • Discussion 	
4:10	2019 Groundwater Management Activities <ul style="list-style-type: none"> • Prop 1 Implementation Grant • 2014 GWMP Update • TVS Basin Survey of Well Owners - II 	SAG
4:30	Adjourn	

Tahoe Valley South
Groundwater Management Plan
2019 SAG Workshop 1
July 23, 2019

Lahontan Regional Water Quality Control Board
South Y Activity Updates

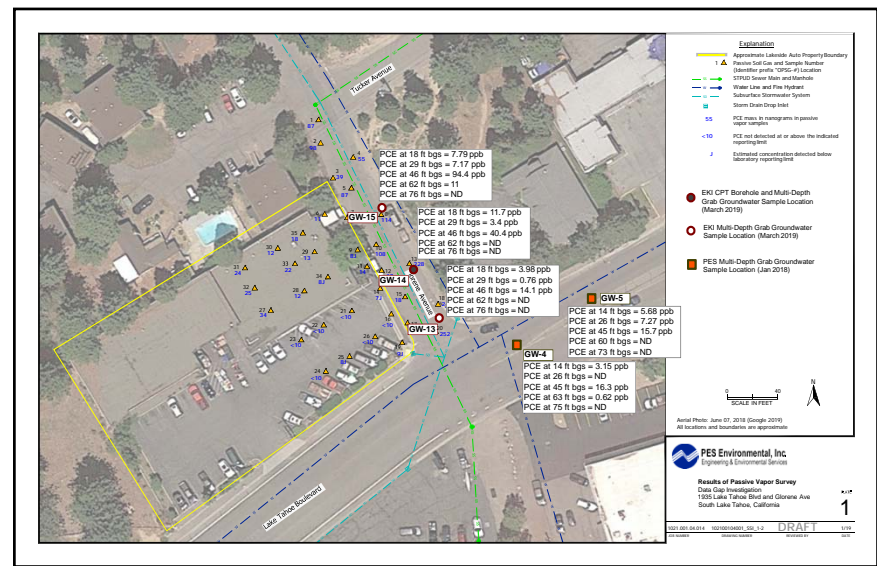
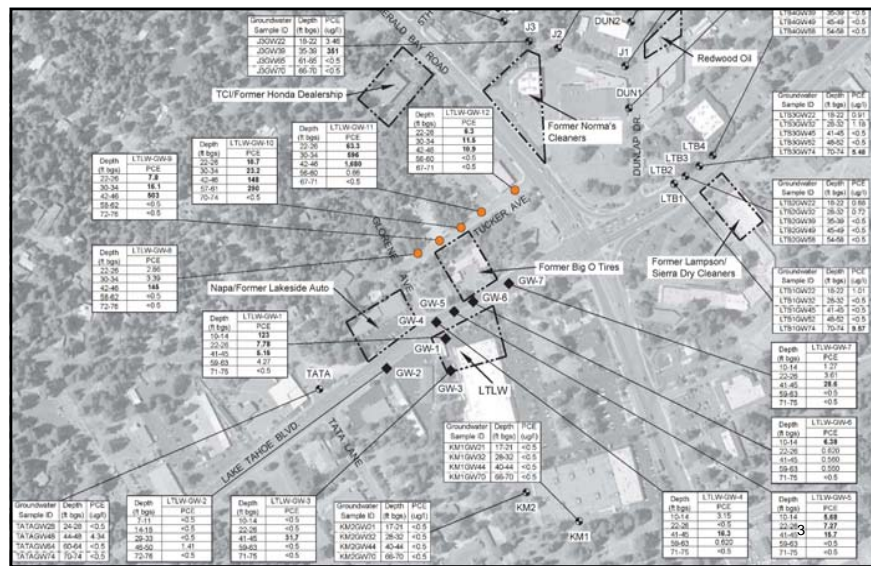


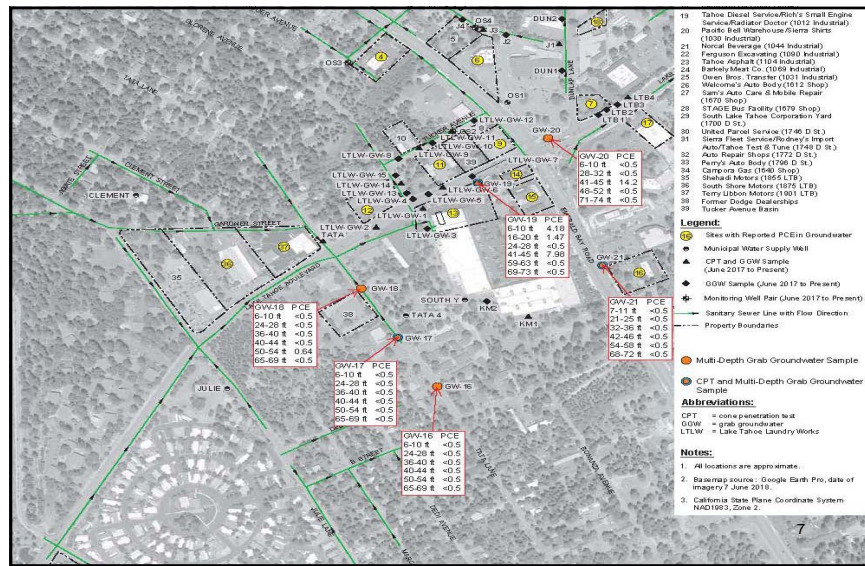
Brian Grey, PG
Engineering Geologist

Presentation

South Y Activity Updates

- Lake Tahoe Laundry Works
 - Results overview
 - Upcoming work
- Regional Plume Characterization
 - Recent directives
 - Framework
 - Initial SB 445 results





Lake Tahoe Laundry Works

Proposed Work

- Tucker Basin
- Big O
 - Passive soil gas
 - Sewer
- On-site Remedial Action Plan

Regional Plume Characterization

Recent Directives and Status

- Requests for Site History
 - 114 responses received
 - 29 notices of violation
- Big O
 - Petition and Request for Stay
 - No work plan received
- Hurzel Properties LLC
 - No petition
 - No work plan; questionnaire/Phase 1 received
- Lakeside Napa
 - Revised questionnaire received
 - Recommend No Further Action Required

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Regional Plume Characterization

Upcoming Tasks

- Continue regional characterization
- Inventory and database development
- Prioritize vertical conduits for destruction
- Perform non-municipal well sampling
- Evaluate sentry well locations

10



Jason Burke

City of South Lake Tahoe Stormwater Management Program



Jason Burke
Stormwater Program Coordinator
7/23/2019

Municipal Stormwater Permit

National Pollutant Discharge Elimination System (NPDES)

- Order No. R6T-2017-0010
(NPDES No. CAG616001)
(3/9/2017 through 3/9/2022)
- Previous Permits:
 - Order No. R6T-2011-0101A1
 - Order No. R6T-2005-0026
 - Order No. 6-00-82
 - Order No. 6-92-02

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION
ORDER NO. R6T-2017-0010
NPDES NO. CAG616001
RENEWED WASTE DISCHARGE REQUIREMENTS AND NATIONAL
POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
FOR
STORM WATER/URBAN RUNOFF DISCHARGES FROM EL DORADO
COUNTY, PLACER COUNTY, AND THE CITY OF SOUTH LAKE TAHOE
WITHIN THE LAKE TAHOE HYDROLOGIC UNIT



Municipal Stormwater Permit Requirements (MS4 Permit)

MS4 = Municipal Separate Storm Sewer System

Stormwater Management Program:

- Construction
- Commercial/Industrial/Residential
- Municipal Stormwater Facilities
- Illicit Discharge
- New Development/Redevelopment
- Education and Outreach (public and municipal)

**Lake Tahoe Total Maximum Daily Load (TMDL)
Regional Stormwater Monitoring Program (RSWMP)**

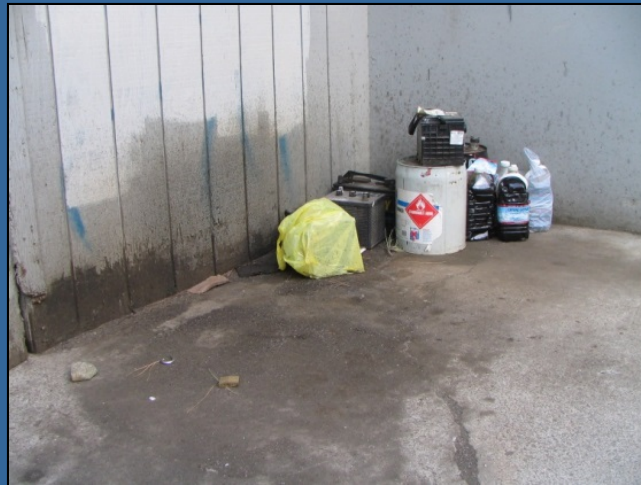
Construction: Ensure no pollutants in construction site runoff



- Building Permits
- Grading Permits
- Standard Details
- Inspections
- Enforcement

Commercial/Industrial: Ensure businesses do not pollute water

- Outreach
- Inspections
- Enforcement



A watershed is the total land area from which rainwater and snowmelt drains into a stream, river, or body of water. Your business lies within the watershed and your actions have a direct impact on the health and cleanliness of that watershed. These Best Management Practices can help keep pollution such as oil, grease, and cleaning fluids out of our stormwater and out of our local streams, rivers, and lakes.

Best Management Practices to Stop Stormwater Pollution

FOR CLEANING SERVICES



Cleaning waste must be collected and discharged to a sink, toilet, or other drain connected to the sanitary sewer system. Make sure you check with the customer before using drains on their premises.

DO NOT dump washwater in a street, gutter, parking lot, or storm drain.

If possible, upgrade to a self-contained, mobile wastewater collection/treatment unit. Depending on your business these units may be appropriate and cost-effective.



Try to use “non-toxic”, “biodegradable” or “all-natural” cleaning products. Washwater still must be disposed of properly. Just because products are non-toxic to the user, they can still be harmful to wildlife if they enter a storm drain.



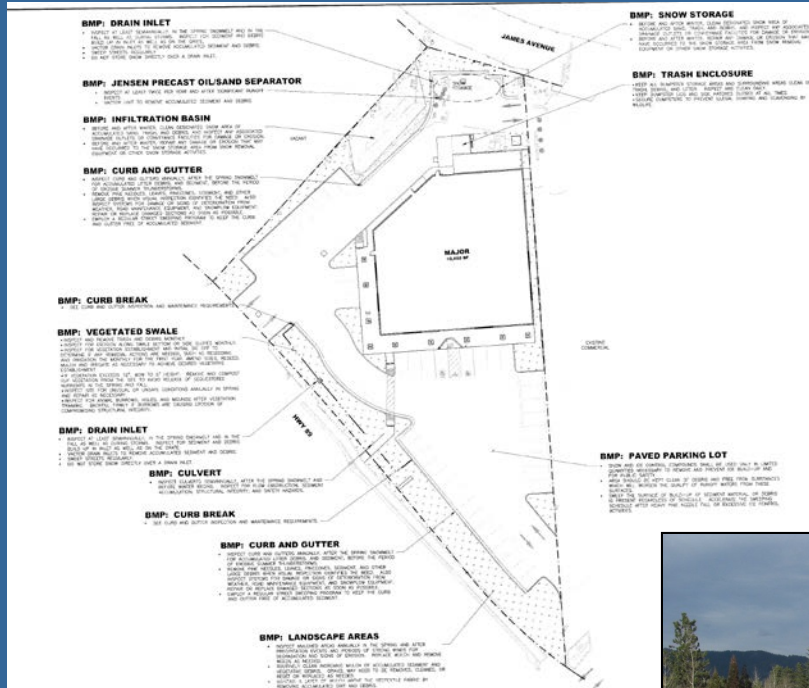
For more information about Best Management Practices and the Stormwater Management Program visit www.cityofsit.us/stormwater or call (530) 542-6038.

Municipal: Ensure no pollutants in runoff from City operations



- Inspect
- Clean drains
- Operations
 - Traction material
 - Street Sweeping

New Development/Redevelopment



- Plan Review
- Inspection
- Project Completion





Education and Outreach

- Community and volunteer events
- Municipal staff training



City of South Lake Tahoe

STORMWATER MANAGEMENT PROGRAM



Public Information Brochure

6 Easy Ways You Can Keep Our Stormwater Clean

- 1 Auto Care**
Repair leaks from your vehicle. Dispose of auto fluids and batteries properly. Take your car to a car wash that treats waste or try washing your car on your yard so that rinse water stays on-site and returns into the ground.

- 2 Lawn Care**
Use pesticides, fertilizers and chemicals sparingly. Compost or mulch yard waste. Within city limits South Tahoe Refuse will pick up your unwanted yard waste for free. Never dump yard waste into storm drains. And do not over water your lawn.

- 3 Pet Waste**
Pick up after your pet! Many popular trails and walkways in South Lake Tahoe provide plastic bags for waste pickup but always bring your own just in case and always dispose of waste properly.

- 4 Landscaping**
Install Best Management Practices (BMPs) to help infiltrate rain and keep your sediment on-site. Examples include infiltration trenches, dry wells, and stabilized slopes. Protect piles of dirt and yard waste with compost, tarps or secured plastic sheeting.
- 5 Snow Removal and Storage**
In areas that receive snow removal, paved driveways and parking pads can prevent soil disturbance and transport of sediment. Store snow piles on flat well-vegetated areas and don't dump snow down storm drains.

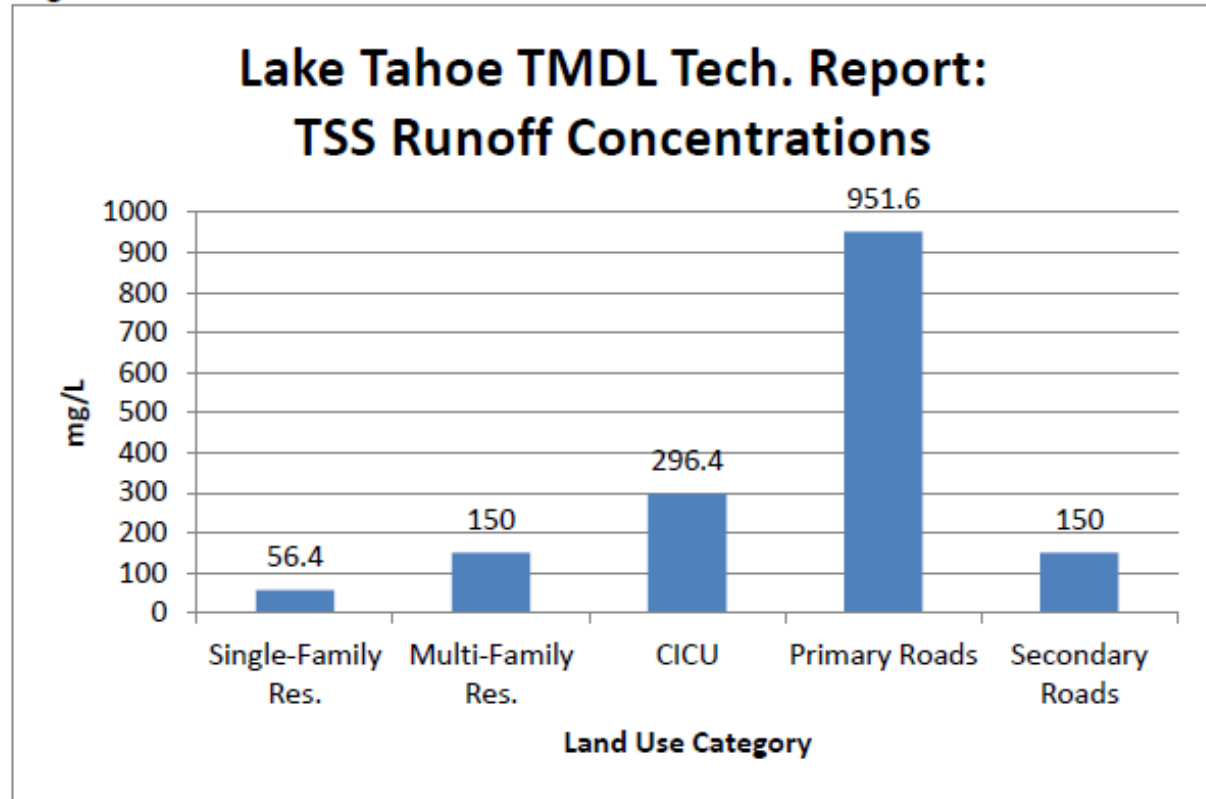
- 6 Household Hazardous Waste**
Use safer alternatives to hazardous materials such as compost instead of chemical fertilizer, water-based instead of oil-based paint, etc. Only buy hazardous products in the quantity that you need. Use up the product entirely or dispose of any unused portions properly.



Lake Tahoe TMDL

Lake Tahoe Total Maximum Daily Load

Figure 1

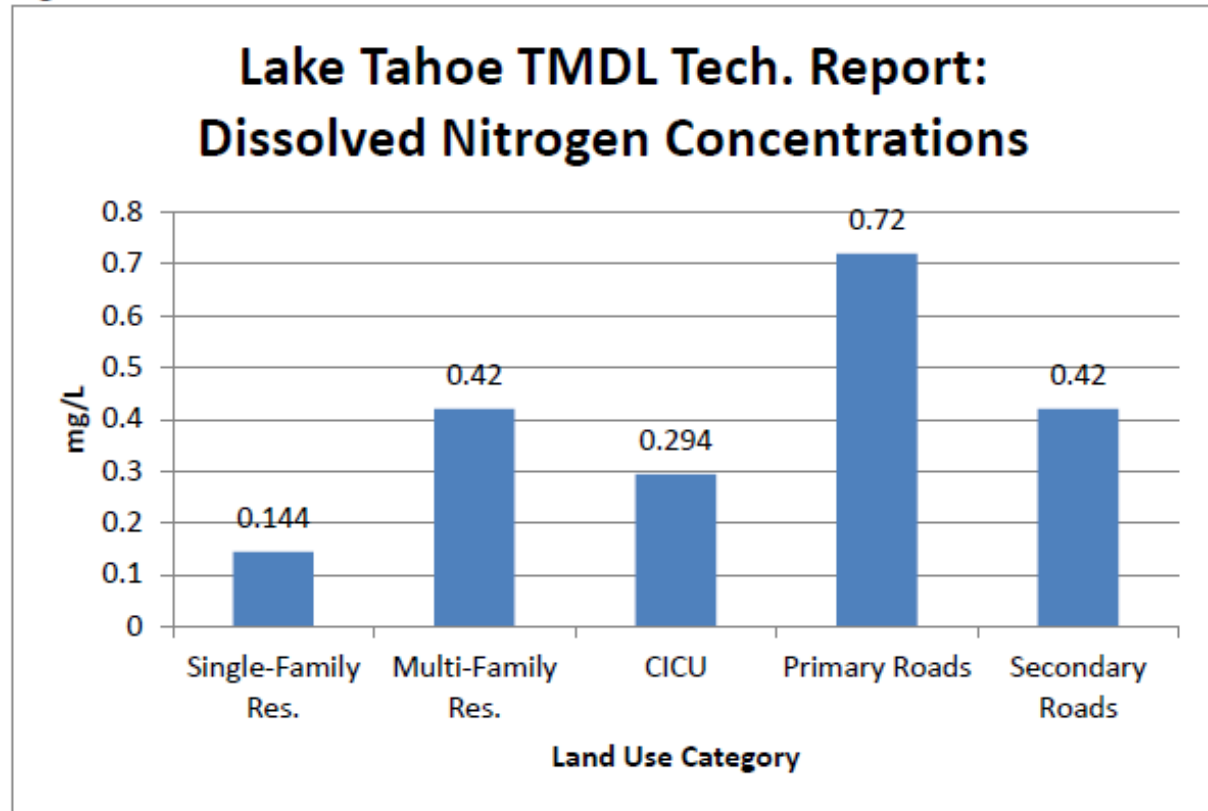


Source: Lake Tahoe TMDL Technical Report, June 2010, Source Analysis, page 4-61

Lake Tahoe TMDL

Lake Tahoe Total Maximum Daily Load

Figure 2



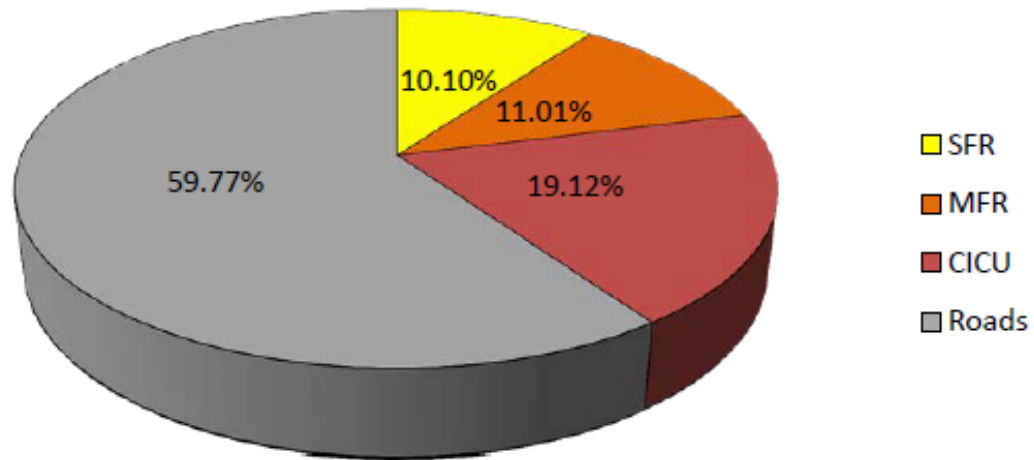
Source: Lake Tahoe TMDL Technical Report, June 2010, Source Analysis, page 4-61

Lake Tahoe TMDL

Lake Tahoe Total Maximum Daily Load

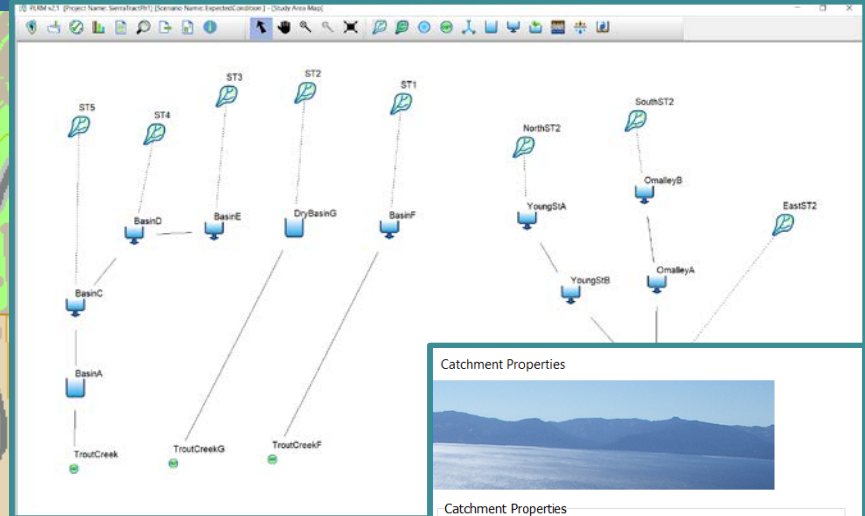
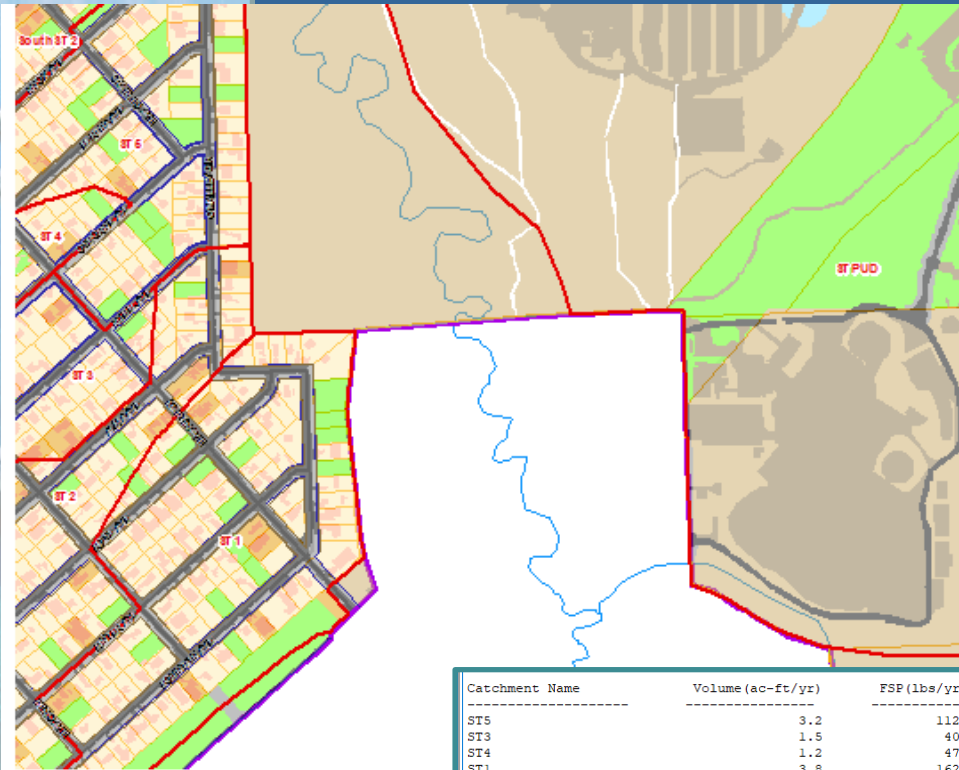
Figure 3

Annual Upland Urban FSP (tons/year) Loading by Land Use



Source: Lake Tahoe TMDL Technical Report, June 2010, Source Analysis, page 4-77

PLRM – Pollutant Load Reduction Model



Catchment Properties

Catchment Properties

Name:

Flows To:

Step 1: Define Physical Attributes

Parameters	Values	Units
Land Area	7.07	ac
Slope	5	%

Additional Attributes

- Step 2: Land Uses
- Step 3: Soils
- Step 4: Road Pollutants
- Step 5: Road Drainage
- Step 6: Parcel Drainage and BMPs

Ok

Catchment Name	Volume (ac-ft/yr)	FSP (lbs/yr)	TP (lbs/yr)	TN (lbs/yr)
ST5	3.2	1124	5	21
ST3	1.5	406	2	10
ST4	1.2	472	2	8
ST1	3.8	1624	7	27
SouthST2	2.9	1013	5	19
EastST2	1.2	304	2	8
NorthST2	6.6	2463	11	47
ST2	4.9	1938	8	31

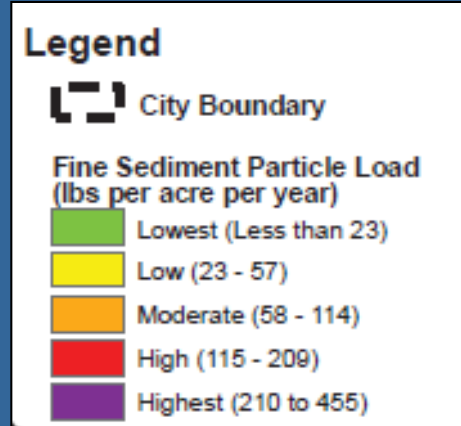
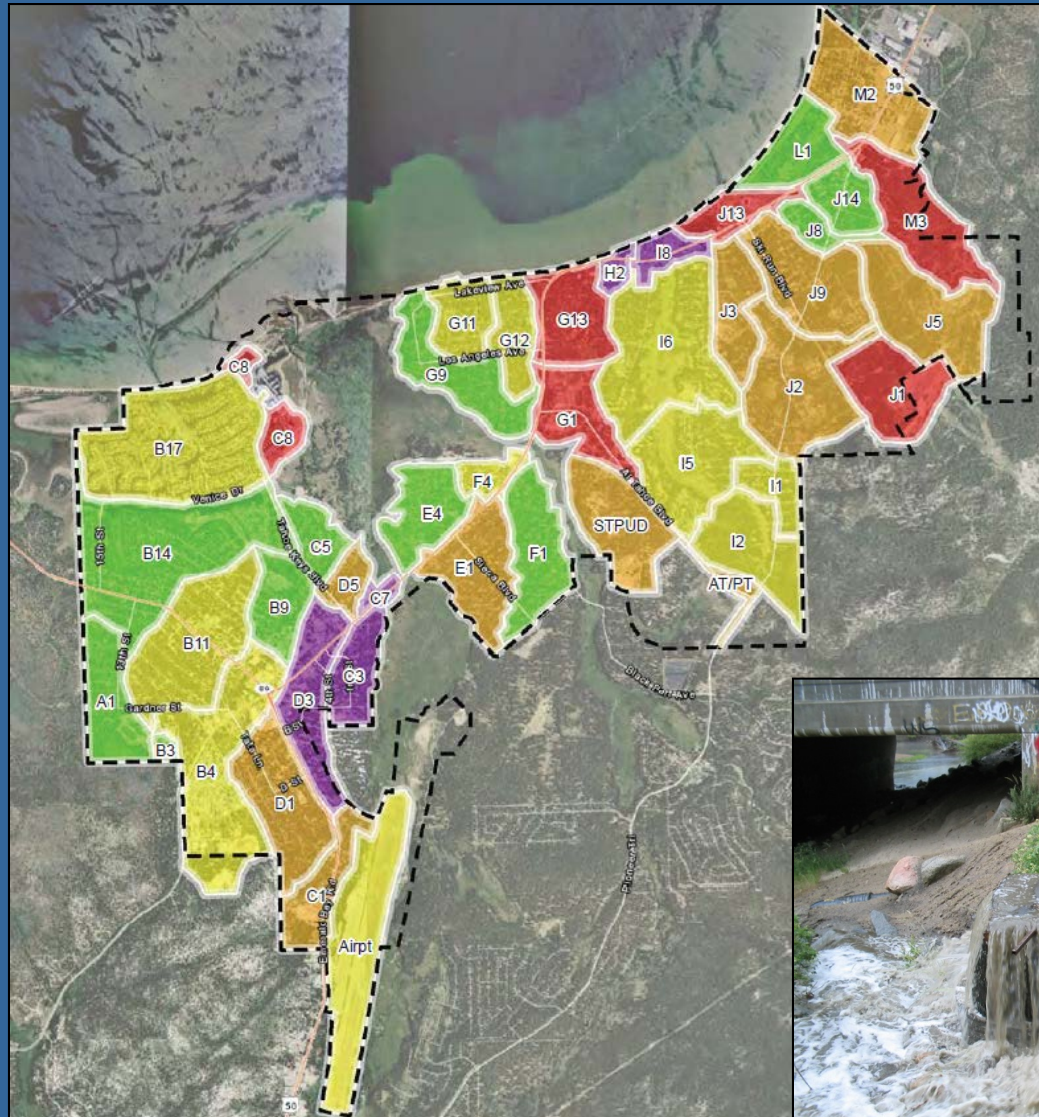
Storm Water Treatment

BasinA	Volume (ac-ft/yr)	FSP (lbs/yr)	TP (lbs/yr)	TN (lbs/yr)
Volume/Load Removed	0.0	4	0	0
%Removed	2%	4%	3%	3%
%Treated	3%			

DryBasinG	Volume (ac-ft/yr)	FSP (lbs/yr)	TP (lbs/yr)	TN (lbs/yr)
Volume/Load Removed	2.2	1842	8	28
%Removed	45%	95%	93%	89%
%Treated	99%			


Lake Tahoe TMDL

Lake Tahoe Total Maximum Daily Load



Drainage Back of



 Engineering

**City of South Lake Tahoe
Stormwater Infrastructure**

0 0.25

E.C. Fritzsche
City of South Lake Tahoe
6/16/2011

Drawn: 1 Feb. 2011 File: 0311_0311_City of South Lake Tahoe/2011 Stormwater Infrastructure 2011.dwg

By: [unclear] Date: [unclear]
Checked: [unclear] Date: [unclear]
Title: [unclear]

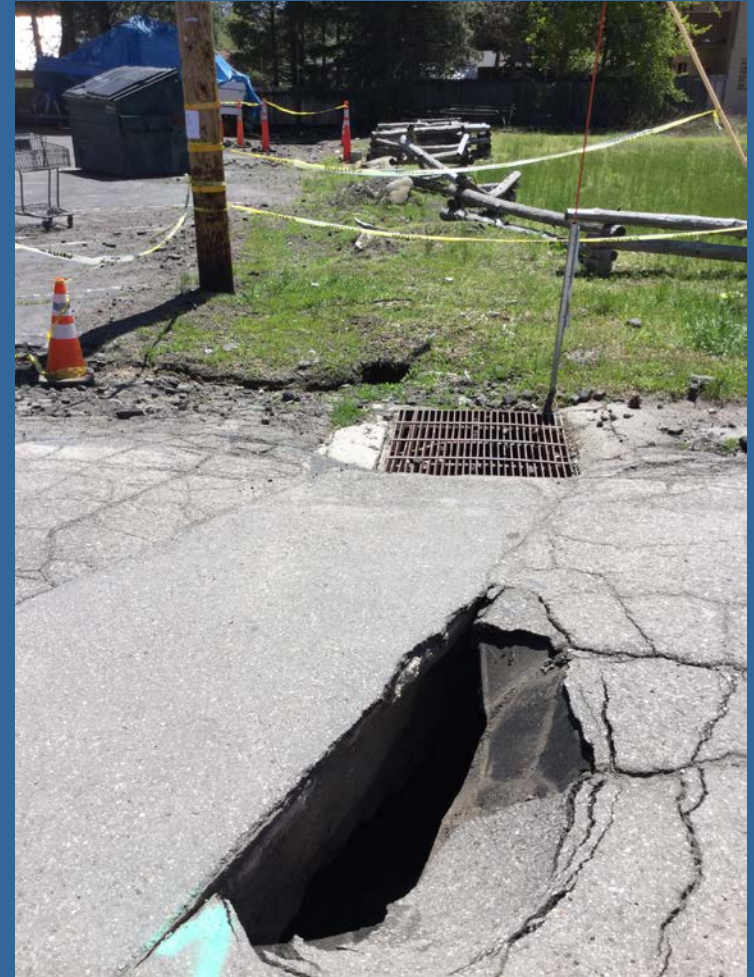
By: [unclear] Date: [unclear]

November 24, 2011
John E. [unclear]

SCALE: 1 INCH = 200 FEET

Sheet: 15 of 2 Sheets

Aging Infrastructure



Aging Equipment



PUBLIC WORKS
94 VEH, 38%
AVG AGE 17 YEARS



OTHER / ADMIN
11 VEH, 4%
AVG AGE 11 YEARS

1970 Michigan

QUESTIONS?





El Dorado County Storm Water Management Program

July 22, 2019

[“Pollution is nothing but the resources we are not harvesting...”](#)
—[Buckminster Fuller](#)

Driving Forces For Watershed Management & Storm Water Control

- * Clean Water Act - 1972
- * State & Federal Water Laws - NPDES
- * Environmental Protection Agency
- * Lahontan Regional Water Quality Control Board
- * Central Valley Regional Water Quality Control Board
- * TRPA - 208 Water Quality Management Plan

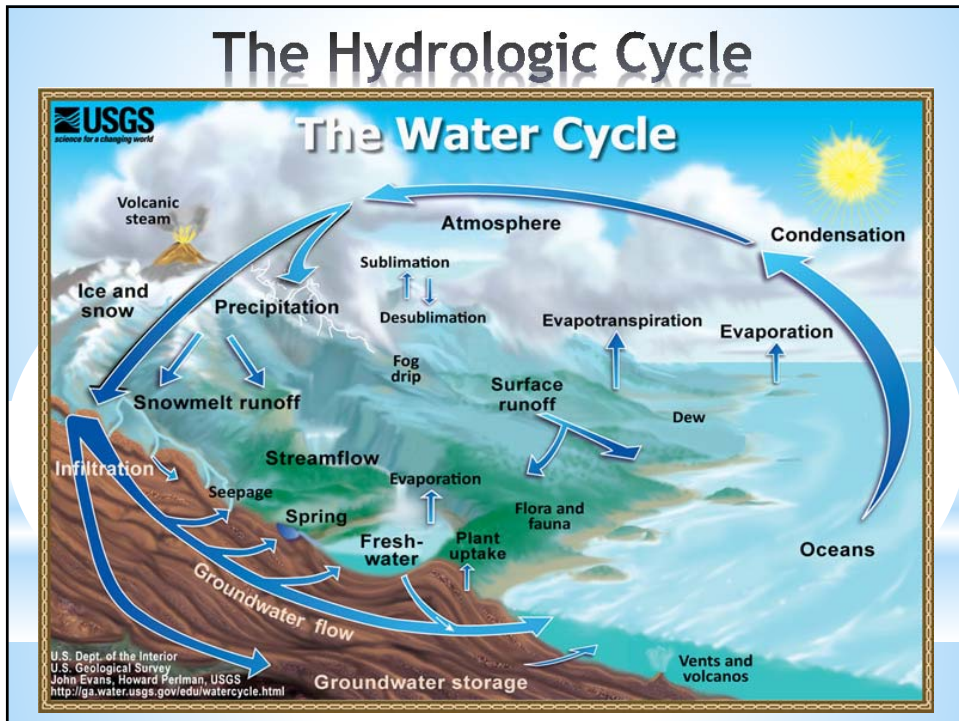


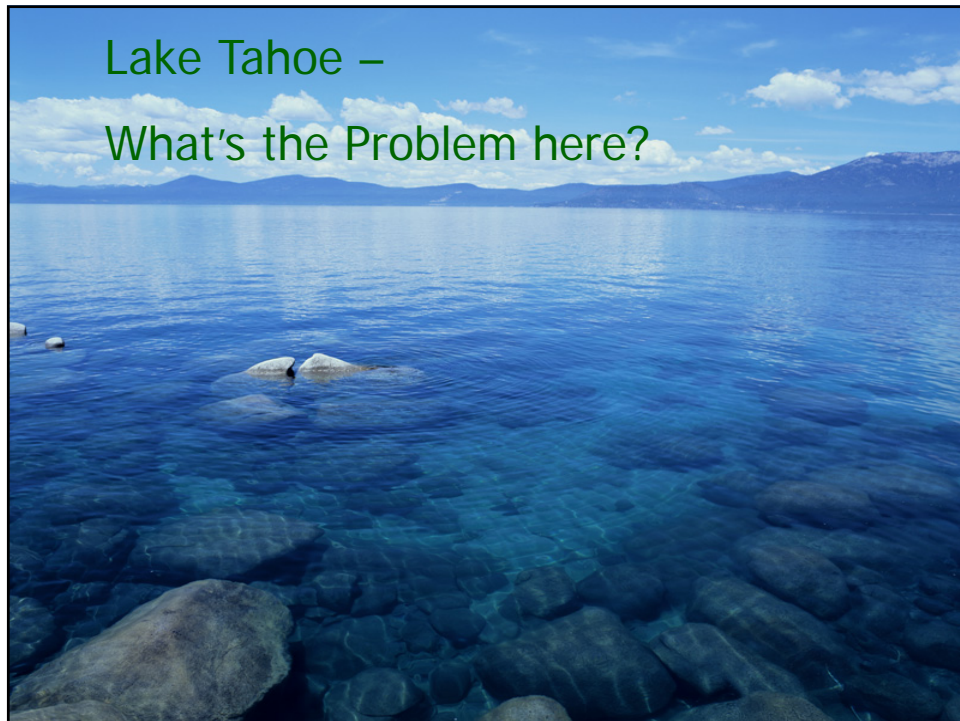
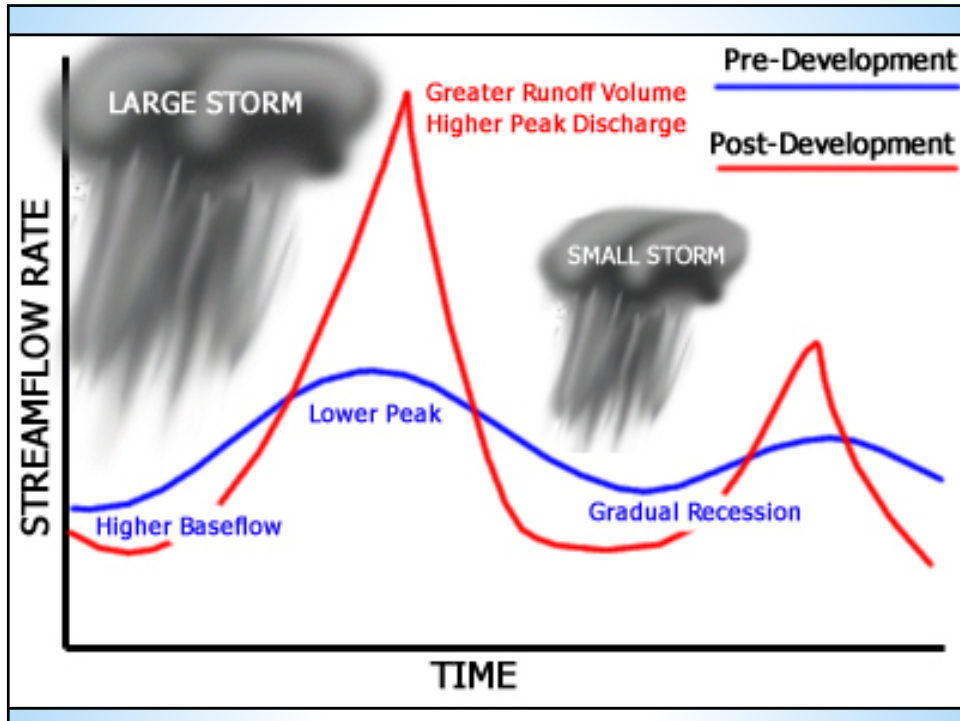
Clean Water Act Goals:

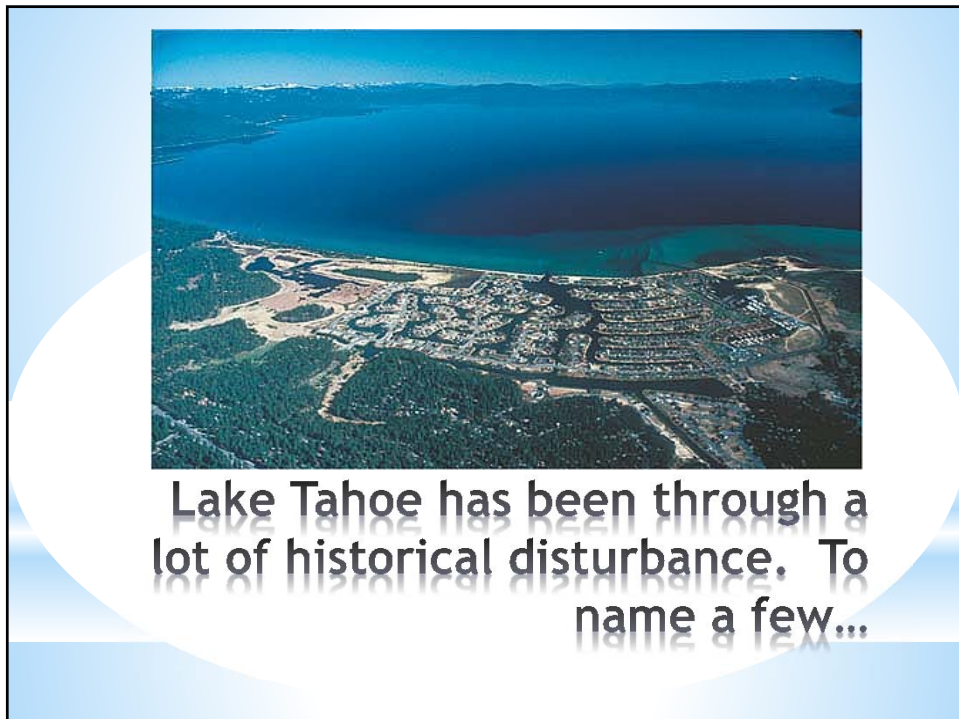
- * "Restore and maintain the chemical, physical and biological integrity of the Nation's waters"
- * "Water quality which provides for ensuring the Nation's waters are fishable and swimmable"



The Hydrologic Cycle







Lake Tahoe has been through a lot of historical disturbance. To name a few...

Logging / Clearcutting



Overfishing



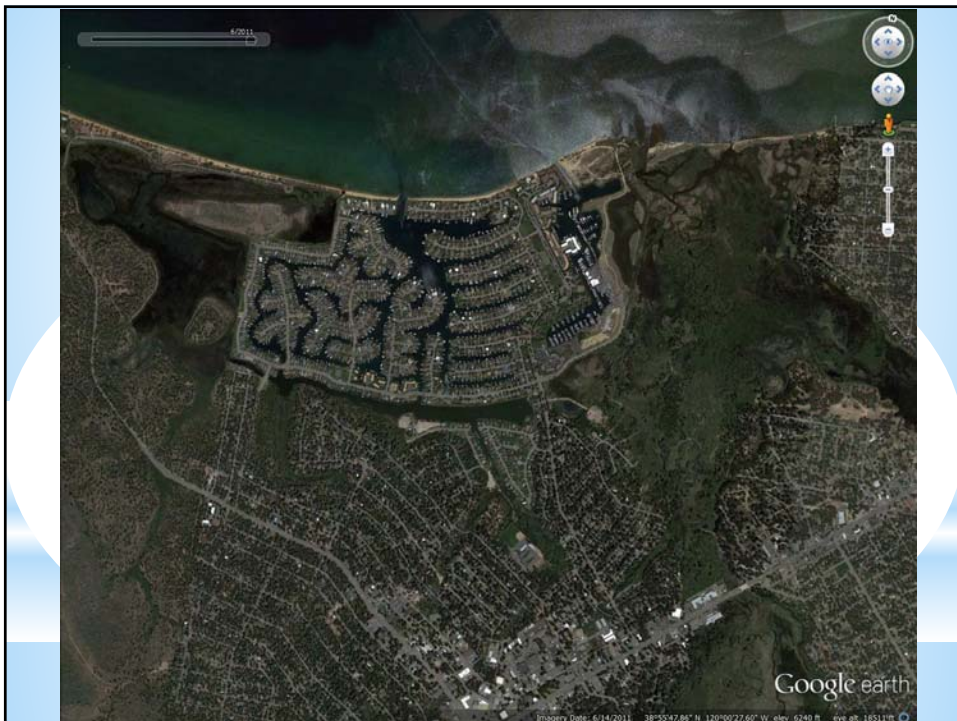
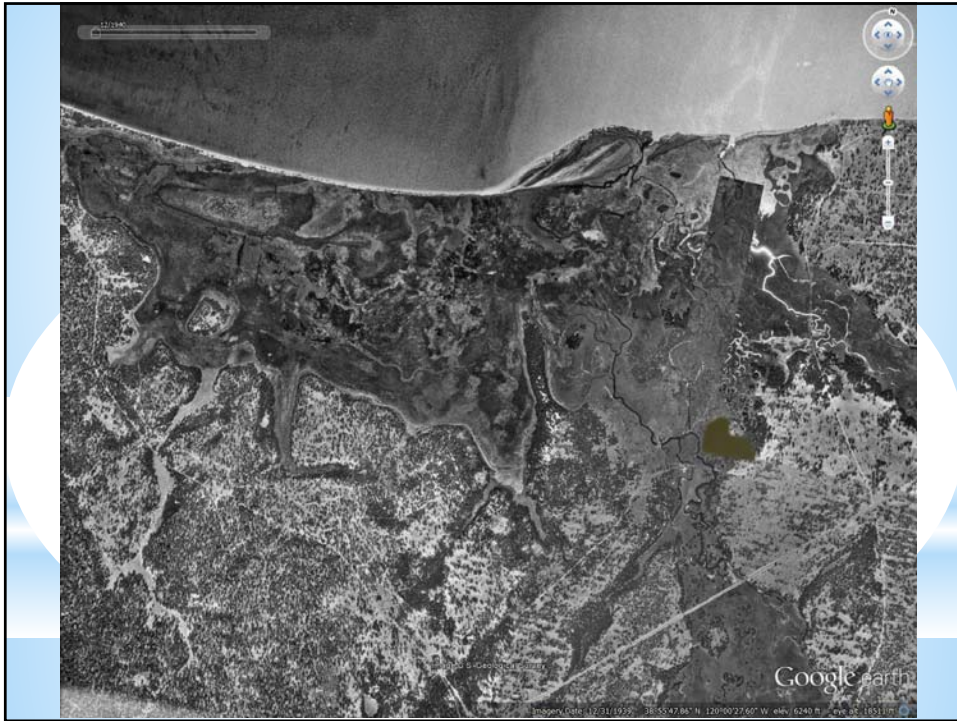
A DAM



Introduction of Invasives

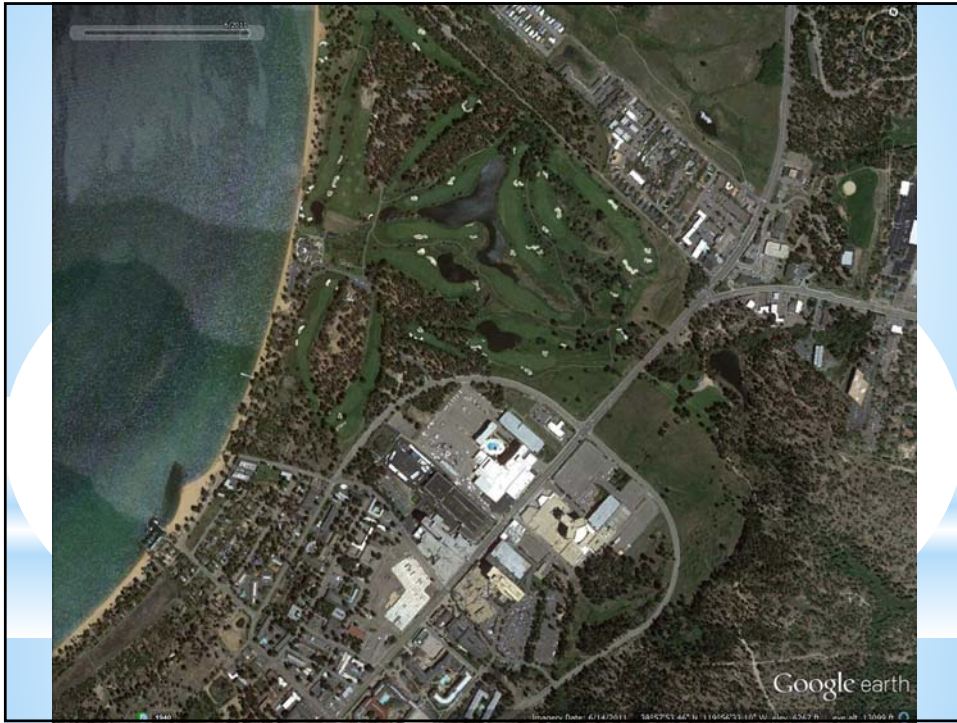


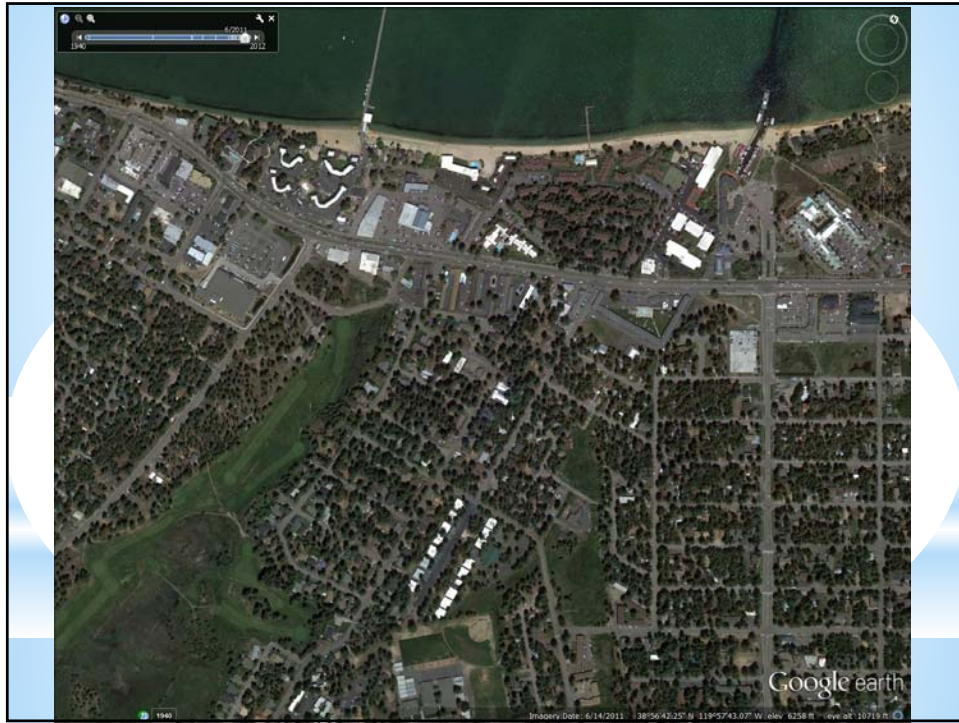




Urbanization







I Think We Took Jimmy Buffett To Seriously!

THEY PAVED PARADISE AND PUT UP A
PARKING LOT?






Traction Sand

Material Distribution based on 1000 ton of aggregate used as winter abrasive	<16 micron load (lbs)
Volcanic Cinders	32,436
Washoe Sand (DG)	2,008
% Reduction	94%
Total Load Reduction	30,428
Credits	152







TAHOE: STATE OF THE LAKE REPORT 2017

CLARITY

Winter Secchi depth

Yearly since 1968

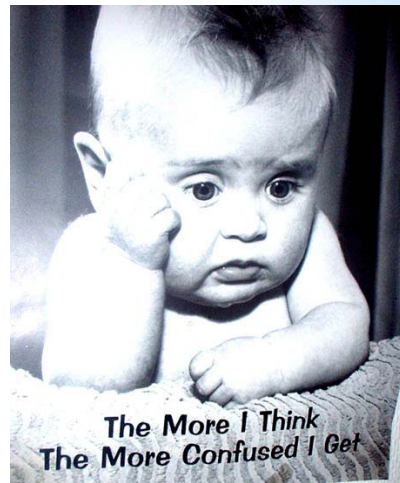
Annual winter (December-March) Secchi depth measurements from 1968 to the present indicate that winter clarity at Lake Tahoe is showing definite improvement. In 2016, winter clarity

increased by 11.7 feet. The winter average of 83.3 feet (25.4 m) was still well above the worst winter average, 65.6 feet (20.0 m), seen in 1997. Winter precipitation (which was close to the long-term

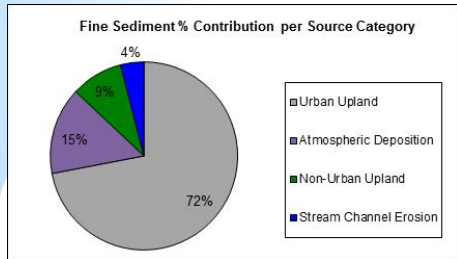
average) had little effect on clarity, due to stormwater control and watershed restoration projects.



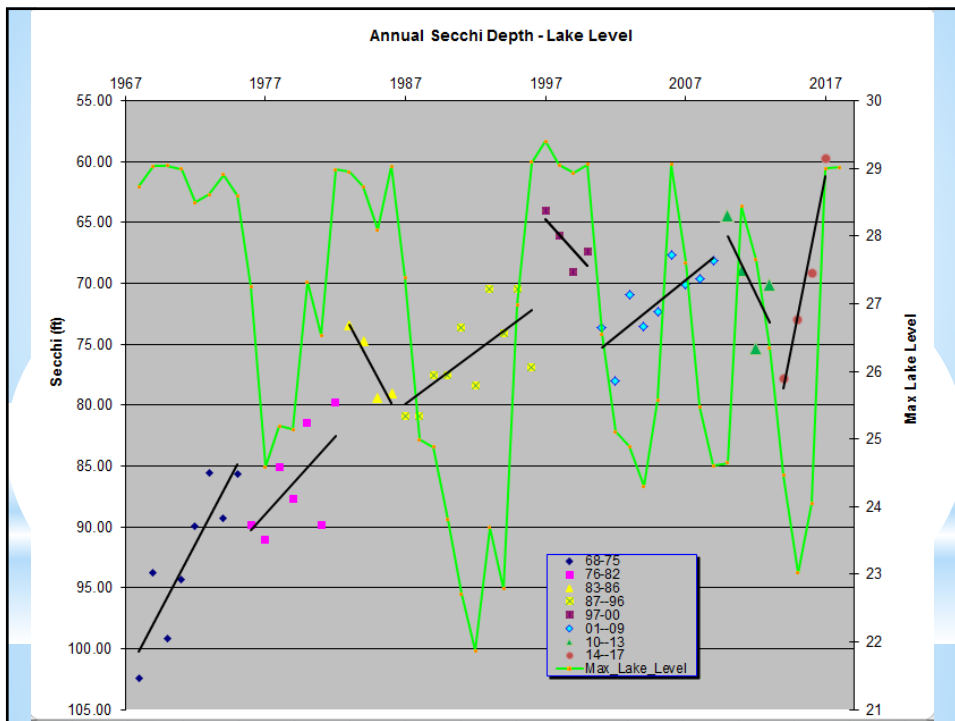
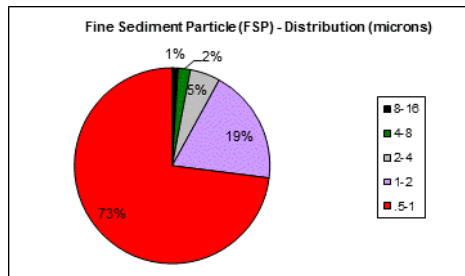
What Can We Control For Optimizing Lake Clarity?

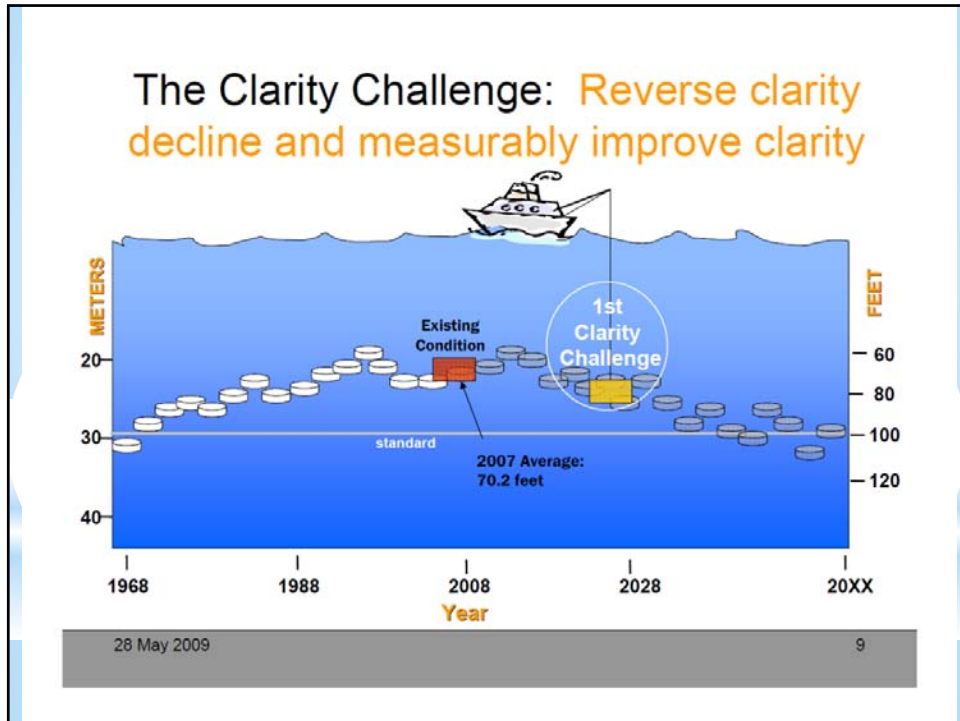


* Lake Clarity Source Distribution (Clarity Pie)



* Urban Upland is Stormwater\





* Lake Tahoe TMDL

Problem

- * Lake Tahoe lost about one third of its clarity between 1968 and 2000

Goal

- * Restore lake clarity to 1968 levels - about 100 feet

Primary Objective

- * Reduce FSP by 65% over several decades - (Primary driver for clarity loss)

Lake Clarity Crediting Program

- * 1 Lake Clarity Credit = A box of Fine Sediment Particles (> 16 um) that weighs 200 lbs
- * Based on Average Annual Conditions
- * 65 Years of Load Reduction Strategies to Restore Lake Clarity to the 1968 Standard
- * Storm Water Tools - PLRM, Road RAM, BMP RAM, CAP
- * Our Path to NPDES Permit Compliance
- * BMPs, Sweeping, Abrasives, etc.

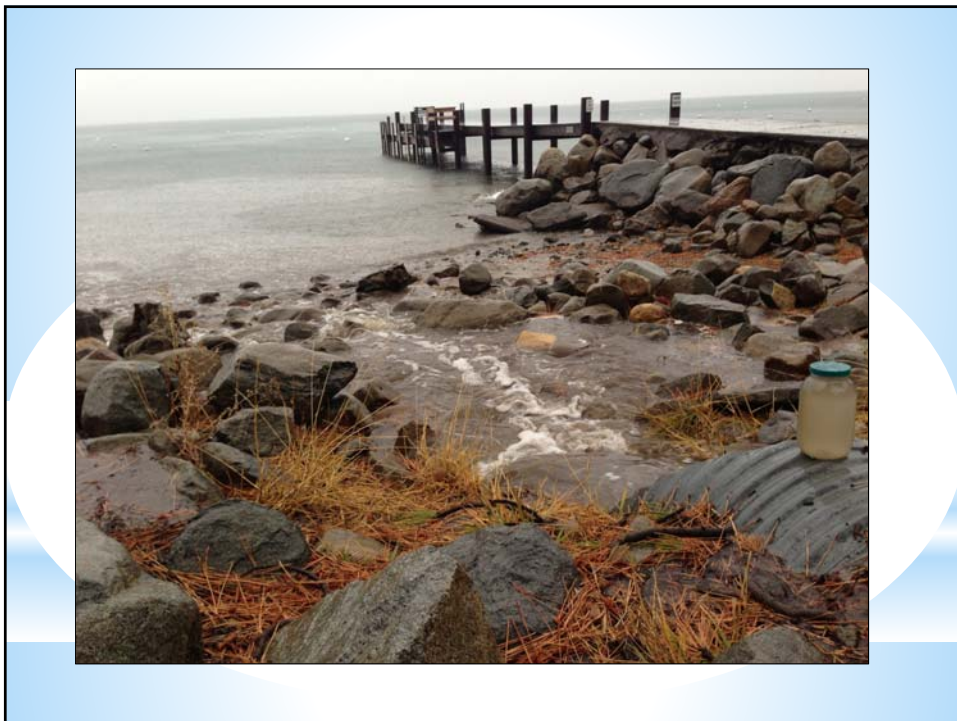


Baseline Loading

Pollutant Load (iteration)	Total Area ¹ (ac)	Surface Runoff (ac-ft/yr)	Pollutant Loading			
			FSP		TP	TN
			(lbs/yr)	(#/yr) ²	(lbs/yr)	(lbs/yr)
PLRMv1 Baseline	19,738	1,360	439,000	2.20E+19	2,300	9,000
PLRMv2: without catchment connectivity	18,250	874	551,480	2.75E+19	1,980	7,000
PLRMv2 Baseline: with catchment connectivity	18,250	526	326,960	1.63E+19	1,170	4,170

When it's Raining - This is Happening!







Infiltrate Urban Runoff







BMPs



Rain Gardens / Micro basin



Costs for Non-Compliance

§ 13385 (a) (California Water Code)

For NPDES permit program violations or discharges to surface water: Up to \$10,000 per day of violation plus an additional liability of \$10 per gallon for each gallon over 1,000 gallons where there is a discharge that is not cleaned up. A “discharge” as used in this section is defined as any discharge from a point source to navigable waters of the United States, any introduction of pollutants into a POTW, or any use or disposal of sewage sludge.



* Communication and Collaboration
Other Means to Prevent Road and Environmental Damage

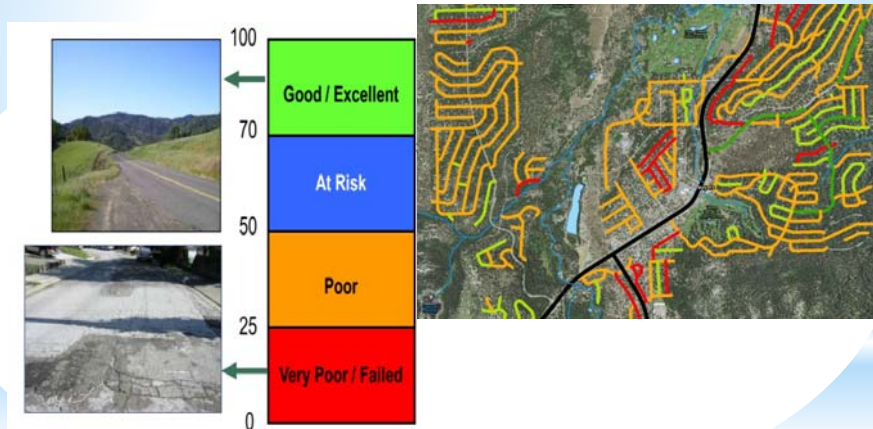
A photograph of a meeting in progress. A group of about a dozen people are seated around a large wooden conference table. Several individuals are wearing bright yellow high-visibility safety vests. The room has a projector screen on the left wall displaying a landscape image, and large windows in the background. The text above the photo reads "* Communication and Collaboration" and "Other Means to Prevent Road and Environmental Damage".



Paving the Road to Clarity Maintaining pavement is a BMP

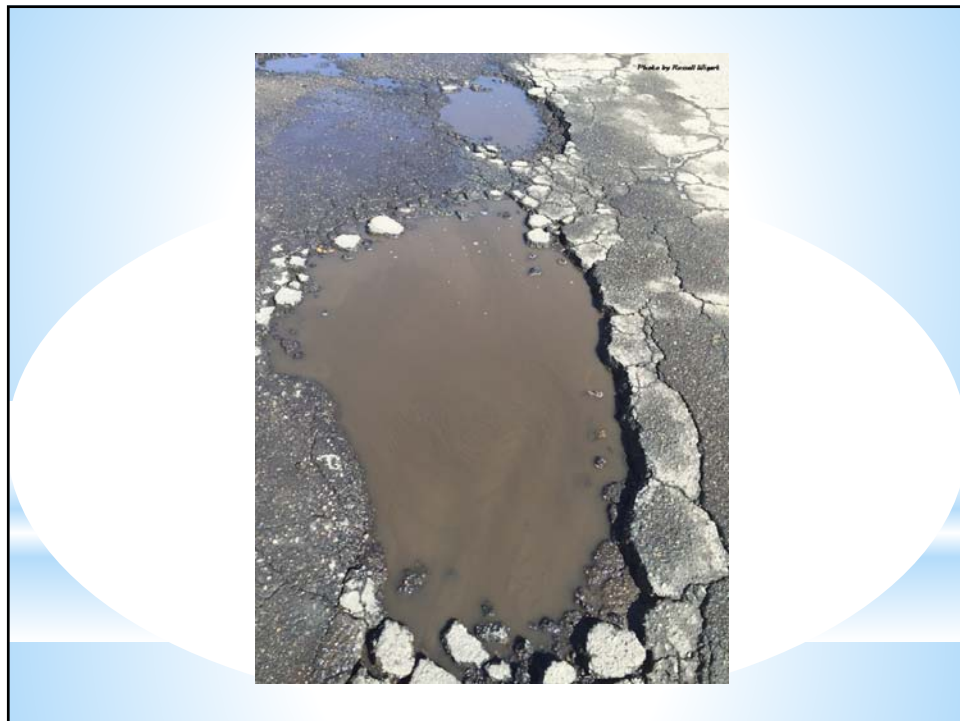
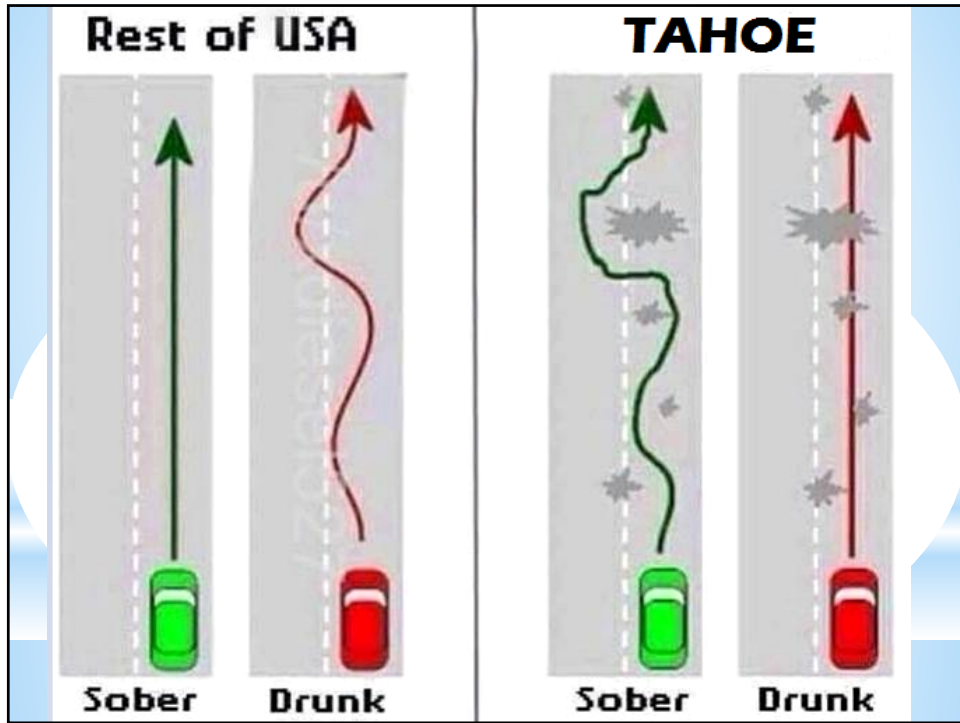


* Pavement Condition Index (PCI)



Conflicting interests... But are they?













Multiple Benefit



That's It!!,
For now anyway



OMG Its Still Going

* California Toxics Rule

- * USEPA established water quality criteria for priority pollutants in the National Toxics Rule and the California Toxics Rule, and RWQCBs establish water quality objectives for priority pollutants in basin plans.
- * The SWRCB *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California* (the Policy) went into effect on May 22, 2000 and generally requires limitations for all constituents that will cause, have the reasonable potential to cause, or contribute to chronic toxicity in receiving waters.
- * Tahoe Sampling and Analysis indicated low threat levels and therefore no need for continual analysis

Detention Basin Treatment of Hydrocarbon Compounds in Urban Stormwater
Report March 2006

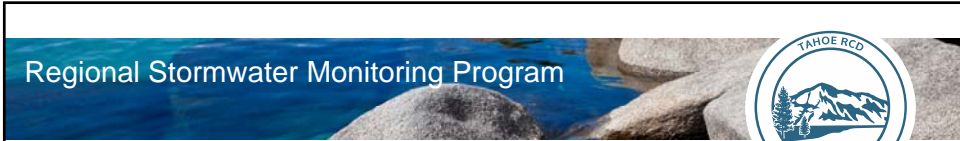
- *STPUD funded in collaboration with partner agencies
- *Purpose - Evaluate potential risk of inadvertent hydrocarbon contamination to shallow groundwater resources from infiltration
- *WY2005 - WY2006
- *Measured SW inflow, and shallow groundwater in infiltration basins.



Regional Stormwater Monitoring Program



Andrea Buxton
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TahoeRCD.org




Regional Stormwater Monitoring Program



RSWMP Background


- Conceived in 2004 to support Lake Tahoe TMDL
- Needed comprehensive monitoring to answer scientific questions
- Coordinated program (RSWMP) established 2013
- Meet NPDES permit requirements
- Collaborative approach encouraged

Regional Stormwater Monitoring Program




Partnership

- City of South Lake Tahoe
- El Dorado County
- Placer County
- Washoe County
- Douglas County
- Nevada Department of Transportation
- Caltrans




Regional Stormwater Monitoring Program




RSWMP Development

- Two original funding sources
 - SNPLMA
 - California State Proposition 84
- Document development
 - Monitoring Plan
 - Sampling and Analysis Plan
 - Quality Assurance Project Plans
 - Framework and Implementation Guidance Document


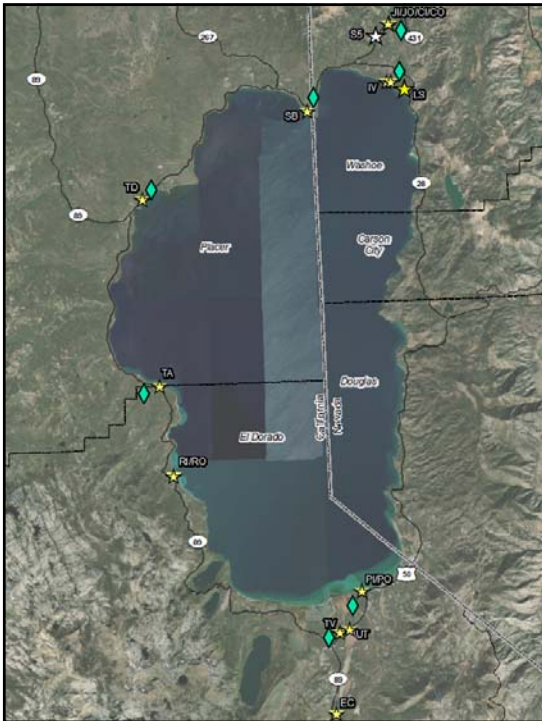


Regional Stormwater Monitoring Program



Framework and Implementation Guidance Document

- Purpose and objectives
- Partner roles and responsibilities
- Funding needs and mechanisms
- Monitoring network (selected sites)
- Priority pollutants and data collection needs
- Data management and analysis methods
- Reporting formats



Current Network

- 12 stormwater monitoring sites
- 6 meteorological stations


Priority Pollutants

- Fine sediment particles (FSP)
- Total nitrogen (TN)
- Total phosphorus (TP)

Data Collected

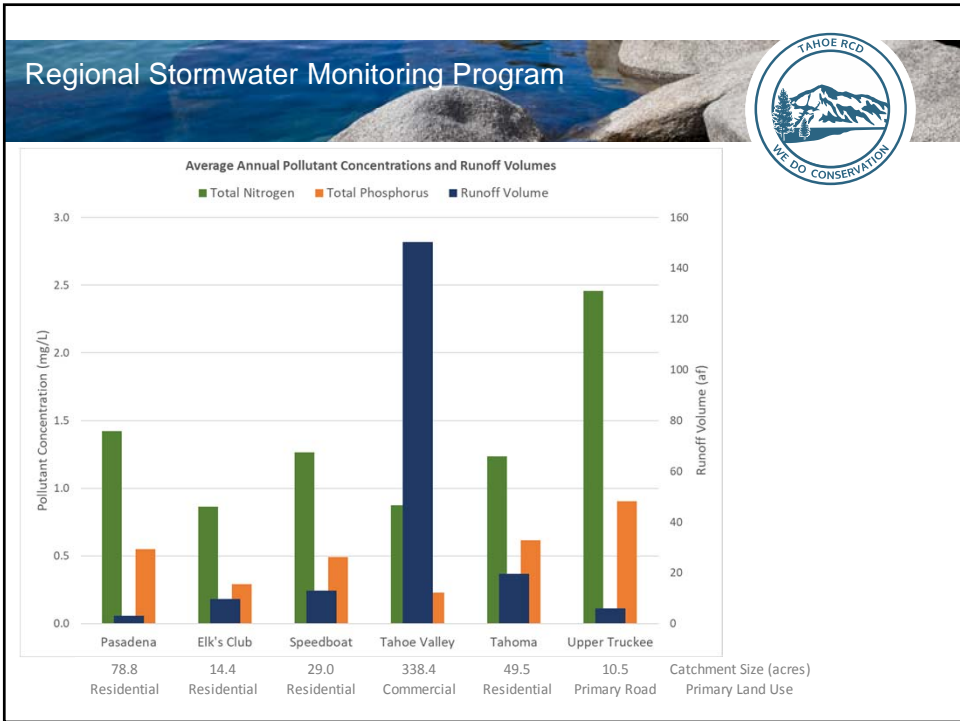
- Continuous flow
- Continuous turbidity
- Water quality samples during chosen events
- Precipitation amount and type
- Temperature


Regional Stormwater Monitoring Program



Analysis and Reporting

- **Status and trends analysis**
 - Status: what was recorded in a particular year
 - Trends: change over time in volume and loading
- **Reporting**
 - Charts, tables, and text to satisfy NPDES permit requirements
 - Submitted to Lahontan Regional Water Quality Control Board (CA) and Nevada Division of Environmental Protection (NV)




Regional Stormwater Monitoring Program 

Pollutant Load Reduction Model (PLRM)


- Used to model urban catchments
- Uses 18 year precipitation record (1989-2006)
- Compare baseline conditions (2004) to current conditions to receive credits
- Comparing monitoring data to PLRM outputs instigated update of cartridge filter effluent values

Site Name	FSP Concentrations (mg/L)			TN Concentrations (mg/L)			TP Concentrations (mg/L)		
	Min	Max	Average	Min	Max	Average	Min	Max	Average
Contech In	94	279	175	1.08	2.12	1.64	0.71	1.87	1.05
Contech Out	69	244	131	0.80	1.87	1.31	0.45	1.54	0.77
Jellyfish In	91	367	202	0.91	2.22	1.44	0.73	1.78	1.14
Jellyfish Out	62	194	114	0.97	1.54	1.29	0.39	1.53	0.78
Pasadena In	27	85	62	1.36	2.21	1.63	0.49	0.85	0.71
Pasadena Out	20	68	44	0.93	2.00	1.42	0.30	0.76	0.55
Original Default CEC			13			1.50			0.14
New Suggested Range			18 - 140			1.0 - 2.2			0.04 - 0.15

Regional Stormwater Monitoring Program 

Benefits of a Coordinated Program


- Consistency
 - Data parameters
 - Collection protocols
 - Collection frequency
 - Data analysis
 - Reporting formats
- Data comparability
- Economies of scale
- Unbiased perspective






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 530-412-0456
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Regional Stormwater Monitoring Program



Sites	Runoff Volumes (af)			FSP Concentrations (mg/L)			FSP Loads (lbs)					
	Min	Max	Average	Min	Max	Average	Min	Max	Average			
Pasadena	1.04	7.52	3.15	20	68	44	148	454	282			
Elk's Club	9.71	9.71	9.71	24	24	24	646	646	646			
Speedboat	5.29	30.29	12.95	59	201	134	1,492	9,218	4,136			
Tahoe Valley	13.44	466.18	150.42	15	42	26	846	29,143	9,515			
Tahoma	4.03	57.02	19.53	15	165	72	978	2,615	1,917			
Upper Truckee	2.36	11.40	6.04	118	164	142	754	3,902	2,311			

Sites	TN Concentrations (mg/L)			TN Loads (lbs)			TP Concentrations (mg/L)			TP Loads (lbs)		
	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
Pasadena	0.93	2.00	1.42	5.3	24.7	11.0	0.30	0.76	0.55	1.7	8.9	4.1
Elk's Club	0.86	0.86	0.86	22.8	22.8	22.8	0.29	0.29	0.29	7.7	7.7	7.7
Speedboat	1.01	1.43	1.26	19.2	84.0	40.7	0.38	0.61	0.49	5.9	31.7	15.8
Tahoe Valley	0.81	0.99	0.87	36.2	1,050.4	341.9	0.17	0.31	0.23	9.3	225.3	76.7
Tahoma	0.53	1.95	1.24	15.5	82.6	48.6	0.16	0.94	0.62	7.1	40.0	21.7
Upper Truckee	1.79	3.50	2.46	11.4	60.4	39.0	0.67	1.27	0.91	4.3	20.9	14.5



TRPA Stormwater Management Program Overview

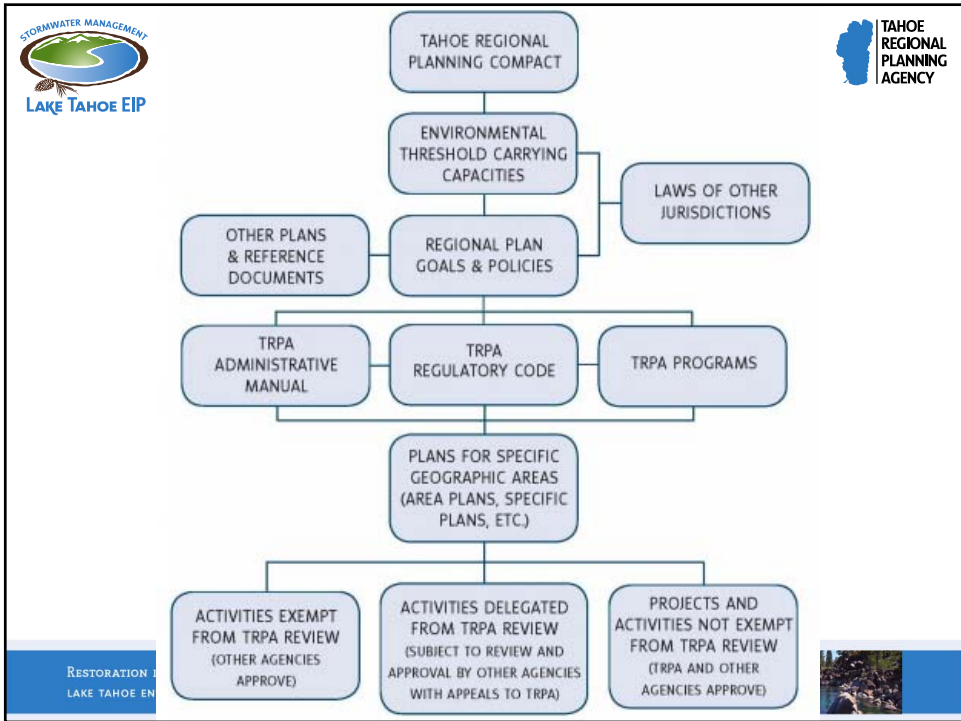
Presentation to the GWMP SAG



Shay Navarro, TRPA Stormwater Program Manager

STPUD, 07/23/2019

RESTORATION IN PROGRESS
LAKE TAHOE ENVIRONMENTAL IMPROVEMENT PROGRAM

continuing the commitment








What are the primary objectives for TRPA's Stormwater Management Program?

- Maintain and Restore Lake Clarity
- Best Management Practices Requirements
- Implement BMP Action Plan

RESTORATION IN PROGRESS
LAKE TAHOE ENVIRONMENTAL IMPROVEMENT PROGRAM

continuing the commitment






How does TRPA collaborate with other agencies to implement stormwater management in the South Shore?

- EIP Working Group
 - Storm Water Quality Improvement Committee
 - Parcel BMP Working Group
- Annual Priority Setting
- Grant requirements & Funding Opportunities

RESTORATION IN PROGRESS
LAKE TAHOE ENVIRONMENTAL IMPROVEMENT PROGRAM

continuing the commitment




 

How is stormwater management considered within TRPA's Source Water Protection Program?

- TRPA Code standards
 - Source water
 - Discharge limits
 - BMP requirements
- BMP Action Plan
 - Sub-surface contamination

RESTORATION IN PROGRESS
LAKE TAHOE ENVIRONMENTAL IMPROVEMENT PROGRAM

continuing the commitment



Questions/Discussion



RESTORATION IN PROGRESS
LAKE TAHOE ENVIRONMENTAL IMPROVEMENT PROGRAM

continuing the commitment

