STATE OF NEVADA
DIVISION OF STATE LANDS
LAKE TAHOE - ENVIRONMENTAL IMPROVEMENT PROJECT
WATER QUALITY AND EROSION CONTROL GRANTS PROGRAM

NEVADA DIVISION OF STATE LANDS
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CARSON CITY, NV 89701
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GRANT APPLICATION PACKET

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GRANT APPLICATION FORM

A. Project Title: US Highway 50 Water Quality Improvement Project - Phase II
(Please refer to project name as listed in EIP)

B. Environmental Improvement Program (EIP Project) # 01.01.02.15

C. Project Location (Please provide map)
US – 50 between Cave Rock and the junction with State Route 28- see the attached map—"Attachment A"

D. Project Description: Please attach separately, and refer to Project Description Requirements (**included within**).

E. Applicant's Name and Contact Information
Nevada Department of Transportation
Charles Wolf, P.E., Chief Hydraulic Engineer
1263 South Stewart Street
Carson City, Nevada 89712
Phone: 888-7622 Fax: 888-7177 Email cwolf@dot.state.nv.us

F. Estimated Total Project Cost: $3,465,524

Grant Amount Requested (Grant amounts requested from non-state agencies cannot exceed 75% of total cost of design & construction).
$ 750,000

Sources and amounts of matching funds:
Nevada State Gas Tax

G. Owner of Property(ies): State of Nevada—Department of Transportation

If others hold any outstanding property rights (additional owners, public/private easements, etc.), attach explanation of how they will participate.

H. On behalf of the **Nevada Department of Transportation.** I request this Application be considered for financial assistance with the Nevada Division of State Lands, Water Quality and Erosion Control Grants Program.

Charles Wolf, P.E., Chief Hydraulic Engineer

Signature	Title	Date
Charles Wolf	CHIEF HYDRAULIC ENGR	11-10-15

PROJECT DESCRIPTION REQUIREMENTS

(Please answer the following questions on separate sheets of paper in the order provided below.)

1. **Project Schedule–**

   Project planning for this section of US50 began in 2007. The design for Phase A was completed in 2011 and the project advertised in early 2011. Construction began in May of 2011 and wrapped up in late 2012. The design for this project, Phase B, ran concurrent with the final design for Phase A and Phase B design reached a 60% level in late 2012. Phase B was ultimately put on hold due to funding shortfalls. Phase B just wrapped 60% design and is progressing towards final design. Final design is will be complete on January 19, 2016 and is scheduled to advertise on February 3, 2016. Notice to proceed is anticipated on May 9, 2016 with construction to start shortly thereafter. Construction is estimated at one season with completion for the fall of 2016.

2. **Project Participants**–

   Wood Rodgers was the project consultant for the Phase A project and for a portion of Phase B through the 60% design level. NDOT picked up resumed design on the Phase B project at the 60% design level, re-scoped it, and is completing final design for Phase B. NDOT will award and administer the construction contract and project implementation.

3. **Project Summary and Site Plan–**

   The US 50 Water Quality and Sediment/Erosion Control project begins just south of Logan House Creek and proceeds easterly along US50 towards the junction of SR 28 with US50. The areas adjacent to the roadway for the first half of the project are sparsely populated with residential development while the second half of project area is flanked by private, state and federally owned land parcels. All the proposed improvements will be constructed within existing NDOT right-of-way.

   The project limits encompass three named creeks, Logan House Creek, North Logan House Creek and Glenbrook Creek and approximately 16 cross-culverts. The crossings vary greatly in proximity and connectivity to Lake Tahoe. The roadway intersects or is adjacent to 20 watersheds that collectively drain approximately 1.23 square miles.

   The project design will provide for improved water quality of stormwater runoff from the NDOT right-of-way as required to meet TRPA 208 Water Quality goals as well as improving roadway safety with more traversable shoulders and improving pavement drainage by reducing the frequency and duration of events causing travel way inundation and hydroplaning hazards.

Proposed source and treatment control measures for the project area include the following:

- Drop inlets with sediment storage/sediment traps
- Shoulder paving and curb & gutter to stabilize eroded shoulders/ditches and to improve maintainability
- Aesthetically faced barrier rail at cut slope toes to effectively disconnect the actively eroding slopes from flow paths
- Stabilized channels using riprap and articulated block lining
- Storm drain system with media filtration devices
- Riprap energy dissipaters at culvert outlets
- Stabilization of bare slopes with rock and/or revegetation treatments

4. **Conceptual Project Goals, Objectives and Anticipated Results—**

Two main objectives of NDOT, as well as the TRPA 2008 Water Quality goals, are the reduction of sediment and nutrients reaching Lake Tahoe. Reductions in sediment volume leaving the project area are accomplished through the design of source control and sediment capture improvements. Sediment generation will be reduced by through source control features such as paving swales, rock lining channels, stabilizing bare slopes and reducing roadside flooding. Sediment capture improvements will include the installation of sediment traps, media filtration units and drop inlets complete with additional sediment sump storage.

Project drainage systems are designed to capture and convey the 25-year storm event. Currently, existing drop inlets along the project area have no capacity for sediment storage however, under project conditions, these existing structures will be replaced with structures modified for added sediment storage capacity. In addition, "double" can sediment structures will be installed where appropriate to treat runoff that is not treated via these modified drop inlets or where additional treatment is required. Runoff discharging from these structures will drain either to existing drainage paths via paved or riprap lined channels or to proposed infiltration basins.

One infiltration basin will be constructed within the project limit. This basin is situated to initially store and then infiltrate runoff with the purpose of capturing sediment reducing nutrient levels.

5. **Operations and Maintenance—**

To achieve the intended goal of reducing both sediment and nutrient level transport to Lake Tahoe, the proposed improvements must be regularly maintained in order to function. To achieve this goal, NDOT will maintain all constructed facilities for a minimum of 20 years. This maintenance will occur as part of NDOT's routine annual Tahoe basin maintenance activities and is typically carried out by both NDOT state forces as well contractor services.

Communication with NDOT maintenance forces regarding the proposed improvements have occurred on a regular basis and have been positive. Project improvements will ease simplify maintenance requirements for this section of road. Considerable effort and expenditures are made on a regular basis to regrade eroded shoulder and cleanup rockfall & slough/eroded material.

6. **Cost Estimate—**

Planning/Design:	$ 724,919 (current)
Implementation.	$ 2,740,605 (@ 60% design—"ATTACHMENT B")
Total	$ 3,465,524

7. **Easements/Acquisition**—

No right-of-way acquisitions necessary

8. **Conformity—**

—NOT APPLICABLE**—**

ASSURANCES

State of Nevada, Division of State Lands
Lake Tahoe Water Quality Grant Program

The Applicant hereby assures and certifies that they will comply with the regulations, policies, guidelines and requirements of the Division of State Lands (the "DIVISION"). Also, the Applicant gives assurance and certifies with respect to the grant that:

A. The Applicant possesses legal authority to apply for the grant, along with the ability to finance and construct the proposed facilities.

B. The Applicant gives assurance that a resolution, motion, statute, authority or similar action has been duly adopted or passed as an official act of the applicant's governing body, authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

C. The Applicant will have sufficient funds available to meet the non-Bond Act share of the costs (match) with the understanding that Grant payments are on a reimbursement basis only. The non-Bond Act share of costs claimed as match will be documented to the same standards as expenditures reimbursed by Bond-Act funds.

D. The Applicant will have sufficient funds available when construction is completed to assure effective operation and maintenance of the facilities for at least 20 (twenty) years after project completion for the purposes constructed. The Applicant will not dispose of or encumber its title or other interests in the site and facilities for 20 years without state approval. The applicant will maintain the project and associated infrastructure for a minimum of 20 years.

E. To the fullest extent permitted by law, the applicant will agree to indemnify, hold harmless and defend the State of Nevada, it's officers, employees, agents and invitees from and against all liabilities, claims, actions, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of any alleged negligent or willful acts or omissions of the Applicant, its officers, employees and agents.

F. The Applicant will furnish progress reports and such other information as the DIVISION may require. At a minimum the DIVISION will be notified and given the opportunity to review the project design and construction at multiple project milestones:

- Project Initiation after grant award
- Completion of 25, 50, and 90 percent of the Project design

- Final design prior to advertisement and award of contract
- Preconstruction Meeting
- Completion of 25, 50 and 75% of construction
- Project completion prior to release of contractor

G. The Applicant will provide and maintain competent and adequate engineering supervision and inspection at the construction site to insure that completed work conforms to the approved plans and specifications.

H. The Applicant will operate and maintain the work done in accordance with the minimum standards as may be required or prescribed by the applicable state and local agencies.

I. The Applicant will obtain all permits, easements and other private and governmental agency approvals required for the project prior to the commencement of construction.

J. The Applicant must receive notice to proceed from the DIVISION prior to advertisement of bids and commencement of construction.

K. The Applicant will give the DIVISION or its designate, access to and the right to audit project records.

L. The Applicant will cause work on the project to be commenced within a reasonable time after receipt of notification from the approving state agency that funds have been approved and that the project will be prosecuted to completion with reasonable diligence.

M. The Applicant will comply with Title IV of the Civil Rights Act of 1964 (P. O. 88-352).

N. The Applicant will establish safeguards to prohibit employees from using their positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have family, business, or other ties.

O. The Applicant will comply with the provisions of the Hatch Act which limit the political activity of employees.

P. The applicant understands that competitive opening bidding is required as outlined in Nevada Revised Statutes Chapter 338.

Name Charles Wolf, P.E., Chief Hydraulic Engineer

Signature Charles Wolf Date: 11-10-15

SAMPLE RESOLUTION

Resolution of the ***[Participant's Governing Body]*** approving the application for State of Nevada Lake Tahoe Water Quality and Stream Environment Zone Grant Funds.

Project: _____Not Applicable_____

WHEREAS, the ***[Participant]*** is submitting an application to the Division of State Lands (the "Division") for financial assistance; and,

WHEREAS, the adopted procedures established by the Division require that the applicant must certify by resolution the approval of proposed project, application, including all understanding and assurances contained therein, and availability of matching funds prior to submission of said applications to the Division.

NOW THEREFORE, BE IT RESOLVED that the proposed ***[Name of Project]*** project is approved for implementation;

BE IT FURTHER RESOLVED that the ***[Governing Body]*** does hereby certify that said agency can finance 100% of their share of the project.

BE IT FURTHER RESOLVED that the ***[Governing Body]*** does hereby appoint ***[Name and Title of Person Delegated] as*** agent of the ***[Governing Body]*** to conduct all negotiations, execute and submit all documents including applications, agreements, billing statements, and so on which may be necessary for the completion of the above project.

Introduced, passed and approved this day of 20, .

---Not Applicable--- **---Not Applicable---**

_____ _____

Name Title

Attest:

_____

Name

_____

Title

5.1 CRITERIA FOR EVALUATING GRANT APPLICATIONS

The information contained in this section describes the general criteria used by the Technical Advisory Committee (TAC) to evaluate the project applications.

Review Process

The Technical Advisory Committee (TAC) will first evaluate grant applications for completeness and consistency with eligibility criteria and objectives of the program. This committee is chaired by the Nevada Division of State Lands (NDSL) and may include representatives from the Tahoe Regional Planning Agency, U.S. Army Corps of Engineers, U.S. Forest Service, U.S. Natural Resource Conservation Service, Nevada Department of Wildlife, Nevada Division of Conservation Districts, Nevada Division of Environmental Protection, and Nevada Division of Forestry. The TAC makes a recommendation to the NDSL Administrator and this recommendation may be presented at a public hearing The NDSL Administrator will prepare a final list of prioritized projects for the award of grants based on public comments and recommendations from the committee. NDSL's Administrator shall make the final decision on project funding. The final project list will be made available to the public.

Evaluation Criteria

The following criteria, as established within NAC 321.355, will be used as appropriate in evaluating projects and setting funding priorities:

1. **Current EIP Project** - The Project must be a project currently listed in the Environmental Improvement Program (EIP).

2. **Significant and Documentable Benefit** to Lake Tahoe water quality. The project must address a significant water quality problem and will result in the reduction of the total maximum daily load of stormwater pollutants of concern as determined by the Nevada Division of Environmental Protection. A determination will be based on, but not strictly limited to, response to the following questions:

   1. Does the project provide public benefit by improving water quality discharged to Lake Tahoe or restoring the natural environment of a stream environment zone?
   2. Does the project meet program guidelines and objectives requirements set forth in Section 6?
   3. Does the project use effective techniques to address the highest priority water quality issues in the project area?
   4. Can the applicant effectively operate and maintain the project?

3. **Comprehensive Approach** - The project considers and addresses all aspects of pollutant delivery to Lake Tahoe as well as degraded stream environment zones and riparian areas in the project area or watershed for which funds are being requested. Preference will be given to comprehensive, integrated project proposals. Private

developments and other public property that contribute stormwater pollutants to the project area should be considered as part of project development. Although state funding cannot be provided to design and implement improvements for BMP Retrofits, comprehensive approaches to planning and project implementation may be necessary to meet future TMDL load allocations. Therefore NDSL encourages cooperation between public and private parties to attain the highest level of pollutant reduction associated with these projects.

4. **Cost Effectiveness** - The project will meet program objectives in the most cost-effective manner. Preference will be given to projects which create maximum leverage for state bond dollars.

5. **Ability to Implement**- The applicant demonstrates its ability and commitment to implement the project in a timely manner. If a project is large and complex, the portion of the project to be funded by the Division must be able to be implemented as a standalone project in a manner consistent with the objectives of the program.

6. **Cooperation and Support** - The applicant demonstrates support of the project by other public agencies, private landowners and groups, and other parties necessary for the successful implementation and long term viability of the project.

7. **Priority for Implementation**-The project is a priority for implementation when referencing the Baseline Conditions Report of the Nevada Jurisdictions' Stormwater Load Reduction Plans and/or to further the attainment of TRPA Environmental Thresholds.

8. **Stream environment zone/riparian/wetland projects**. These projects must address the creation, restoration or enhancement of stream environment zones, riparian areas or wetlands.

6. PROJECT OBJECTIVES AND GUIDELINES

This guidance document is intended to direct project implementers in the design of water quality and stream projects that meet the unique needs and goals of environmental restoration within the Lake Tahoe Basin.

The Division recognizes that the approaches within this document must be applied within the context of professional engineering practices to avoid impacts on public health and safety as well as damage to public and private property. The Division also recognizes that there may be legal limitations or regulatory restrictions within certain project areas.

The Total Maximum Daily Load (TMDL) Technical Report identified fine sediment particles from the urban upland as being the primary pollutant source affecting the clarity of Lake Tahoe. To address fine sediment particles contributions as well as nitrogen and phosphorus, the implementers should refer to the Final Lake Tahoe TMDL document as well as the Integrated Water Quality Management Strategy, Pollutant Reduction Opportunity Report and the Pollutant Load Reduction Model for guidance on pollutant sources and innovative practices that could be incorporated into the project design. These documents can be found at http://ndep.nv.gov. Implementers should also refer to the *Formulating and Evaluating Alternatives for Water Quality Improvement Projects*, the *Interim Guidance Paper for Water Quality Improvement Projects* and *Collaborative Storm Water Quality Project Delivery* documents for guidance in planning, design and implementation of projects. These documents can be found on the Tahoe Regional Planning Agency (TRPA) website at http://trpa.org.

This document is organized into the following sections:

1. PHYSICAL FEASIBILITY FACTORS TO CONSIDER PRIOR TO PROJECT DESIGN.

    1.1 Soil Conditions
    1.2 Water Table
    1.3 Drainage Area
    1.4 Slope Restriction
    1.5 Hydraulic Head

2. SOURCE CONTROL-EROSION CONTROL

    2.1. Soil Stabilization Using Vegetation and Soil Conditioning
        2.1.a. Vegetative cover
        2.1.b. Native Seed or Plants
        2.1.c. Native Organic Mulches
        2.1.d. Soil Amendments
        2.1.e. Revegetation Survival Performance Standards
        2.1.f. Visual Aesthetics

2.2. Structural Slope Stabilization
- 2.2.a Structural Solutions
- 2.2.b. Visual Aesthetics

3. HYDROLOGIC ANALYSIS

3.1 Maintain or create distributed flow patterns where possible
3.2 Maximize infiltration of runoff from impervious surface
3.3 Identify and evaluate possible infiltration sites within project area

4. STORMWATER TREATMENT

4.1. Initial Water Quality Treatment and Conveyance Strategies
- 4.1.a. Course sediment removal
- 4.1.b. Runoff conveyance
- 4.1.c. Separation of urban runoff from non-urban runoff
- 4.1.d. Separation of treated urban runoff from non-treated urban runoff

4.2. Primary Water Quality Treatment
- 4.2.a. Fine particle removal; area and residence time
- 4.2.b. Formulate and evaluate alternatives for critical design elements

5. OTHER FACTORS TO CONSIDER

6. OPERATIONS AND MAINTENANCE

7. STREAM ENVIRONMENT ZONES (SEZ)

7.1. Retain and Restore Natural Geomorphology, Hydrology and Landform
- 7.1.a Apply principles of fluvial geomorphology Impacts to an SEZ
- 7.1.b Enhancing an SEZ

8. POLLUTANT LOAD MODELING

9. MONITORING

8.1. Project or BMP Effectiveness Monitoring

PROJECT DESIGN OBJECTIVES AND GUIDELINES

1. PHYSICAL FEASIBILITY FACTORS TO CONSIDER PRIOR TO PROJECT DESIGN

For additional information and guidance, please refer to the Formulating and Evaluating Alternatives for Water Quality Projects Technical Appendices B-3, BMP Selection, found on the TRPA website at http://www.trpa.org.

1.1 Soil conditions: An initial investigation of soil conditions should at a minimum review the different USDA soil groups as mapped by the Natural Resources Conservation Service (NRCS). Pay particular attention to the associated water features within the hydrologic group. Note that more detailed geotechnical tests are usually required for infiltration feasibility and during design to confirm typical soil and water features of the site including, but not limited to: permeability; runoff potential; depth to bedrock or other impermeable layers; saturated hydraulic conductivity; depth to water table; as well as a number of different physical and chemical factors which may result in significant limitations to BMP installation.

1.2 Water table: The seasonally high water table from the bottom, or floor of a BMP, should be evaluated when siting BMPs and determining their effectiveness and potential impacts to groundwater. Please refer to TRPA's Handbook of Best Management Practices for further guidance.

1.3 Drainage area: The recommended minimum and maximum drainage area considered suitable for the practice. Drainage areas respond differently to precipitation events and therefore BMP siting is critical.

1.4 Slope restriction: Evaluates the effect of slope with siting and assessing the effectiveness and feasibility of specific BMPs that may be installed.

1.5 Hydraulic Head: The elevation difference needed at a site to allow for gravity operation within the practice.

2. SOURCE CONTROL-EROSION CONTROL

Source control is any practice that protects the soil surfaces and reduces or prevents soil particles from being detached by rainfall, overland flow or wind. Source control through erosion control can be a very cost effective measure to reduce sediment loading in high priority areas that are connected to surface water bodies. Source control methods are generally structural or nonstructural in nature.

2.1 SOIL STABILIZATION USING VEGETATION & SOIL CONDITIONING

Resources exist to guide revegetation associated with water quality improvement projects in the Tahoe Basin. These documents are titled *Cave Rock Revegetation Monitoring Program-Improving Sediment Source Control Project in the Lake Tahoe Basin* completed in July of 2005 by Michael Hogan of Integrated Environmental Restoration Services, Inc., *The Revegetation Guidance Document for Erosion Control Projects in the Tahoe Basin* prepared by AECOM in June 2010 and *The Objectives and Guidelines for Revegetation Success Under the Nevada Tahoe Bond Act* prepared by Michael Hogan and dated May 14, 1999. All documents can be obtained from the NDSL offices by contacting Holly Holwager at 775-684-2725. All projects should integrate the best available proven technology with new science when feasible. Vegetative prescriptions are often quite effective when combined with soil conditioning and structural toe stabilization.

2.1.a. Vegetative cover -To the maximum extent possible, retain existing vegetation by minimizing disturbance. Permanent, non-structural erosion control usually involves planting a combination of perennial grasses, shrubs, and trees. **The cost of these non-structural erosion control practices is generally less than structural controls**. In addition, non-structural controls typically involve the least amount of disturbance.

2.1.b. Native seed or plants should be incorporated into every project containing a revegetation component. Selection should reflect the surrounding native plant community. Selection should include a mixture of early, intermediate and climax community species.

2.1.c. Native Organic Mulches - Mulch protects soil from erosion, retains soil moisture moderates soil temperatures and provides nutrients to native plantings. A native mulch of pine or fir needles or other suitable mulch of organic native material should be used over **all seeded, planted, and disturbed areas**. Mulch should be applied at a minimum of 1 to 2 inches in depth.

2.1.d. Soil Amendments and fertilizer should be slow release and include mycorrhizal inoculation suitable for the target plant community. Revegetation areas with nutrient-poor soils should be inoculated with mycorrhizae as a standard practice for all plantings. Soil tests should be used to evaluate soil nutrient deficiencies and to develop soil conditioning plans.

2.1.e. Revegetation Survival Performance Standards -– A revegetation plan must include performance criteria which permit evaluations of revegetation success as well as the need for remediation of implementation measures.

2.1.f. Visual Aesthetics - Projects should be visually appealing as well as functional. Project public meetings should address visual aspects of the project during the design process.

2.2 STRUCTURAL SLOPE STABILIZATION

2.2.a **Structural solutions** for slope stabilization are often necessary in the Tahoe Basin due to the steepness of slopes and the presence of road cuts. The narrow width of road right-of-ways may restrict layback in many locations. Engineered walls, rock slope protection and curb and gutter are several types of erosion control that could be used for either toe stabilization or reducing slope length.

2.2.b. **Visual Aesthetics** – TRPA has visual requirements for some slope stabilization measures if on a scenic route or if visible from the Lake. When using rock slope protection, trees and shrubs should be left intact if possible. The color of rock walls, rock slope protection and the surrounding soil color, is also a visual aspect to be considered. Neighborhood buy-in of the project is also an aspect to consider and project public meetings should be held to address visual aspects of the project during the design process.

3. HYDROLOGIC ANALYSIS

All projects should conduct a hydrologic analysis for the project area watershed and the results of this analysis should be used as a mechanism for choosing and siting various BMPs. These requirements focus on drainage control and the associated increased peak flows and volumes. In addition, the non-event (primarily spring runoff) hydrology of the subwatersheds needs to be integrated into this analysis to adequately consider the entire hydrologic regime (this analysis should also include the evaluation of snow storage areas and their affects on vegetation, soil compaction, pollutant delivery, runoff and facility design and location).

Maintaining naturally functioning hydrologic conditions where runoff from undisturbed areas flows in natural swales and creek channels is critical in the design process because it reduces the need for later treatment.

3.1 **Maintain or create distributed flow patterns** (unconcentrated sheet flow) and avoid concentration of flows where feasible. Infiltrate as close to the source as possible and disconnect impervious surfaces where possible.

3.2 **Maximize infiltration of runoff from impervious surfaces.** Projects which collect and convey runoff excessively often result in higher rates of erosion and tend to overload the treatment capacity and effectiveness of downstream basins. Applicants are encouraged to minimize the collection and conveyance of flows, where possible, which generally do not discharge to streams or other natural surface waters and in cases where erosion is not evident.

In areas where curb and gutter are installed, curb cuts or curb breaks, where appropriate, are preferred in order to allow the conveyed water to spread and infiltrate into available open land. Where practical, consider perforated pipe to provide some infiltration capacity of conveyed systems. Curb, gutter, and pipe are acceptable where narrow rights-of-way or other factors make vegetated or rock-lined swales impractical.

Natural conveyance systems which allow water to infiltrate into the ground and plants to become established are encouraged and are preferred, if feasible, over conventional systems such as paved swales, pipes, and rock-lined ditches with filter fabric. Treatment systems that spread water over well-vegetated areas are encouraged, particularly those with ponding depths of six to twelve inches and residence times of three to five days or longer (county standards regarding vector control however may limit residence times).

3.3 Identify possible infiltration sites within project area. Applicants are encouraged to identify all existing areas within the project site to maximize capacity to infiltrate flow. If necessary, purchasing easements or private parcels that can treat large volumes of water associated with larger storm events should be explored. Identify areas early in the design process that have potential for treatment areas and work with the NV Division of State Lands and the US Forest Service to explore alternative treatment opportunities on individual parcels. In situations where stormwater from multiple jurisdictions (e.g. NDOT, Counties etc.) is conveyed to similar locations, it may be prudent to investigate the possibility of implementing joint-use facilities to maximize load reduction potential for each agency.

4. STORMWATER TREATMENT

Treatment of storm water can be done in many ways. Among the most effective, and typically the desired alternative, is to facilitate water dispersion for infiltration into the soil. This provides an effective filter for those fine sediment particles and accompanying nutrient load reductions. Infiltration treatment can include vegetated swales, infiltration basins and subsurface infiltration systems.

Mechanical structures should be used if it is determined that further treatment is needed in addition to source control and infiltration.

4.1. INITIAL WATER QUALITY TREATMENT AND CONVEYANCE STRATEGIES

4.1.a. Coarse Sediment Removal - Design and install water quality treatment facilities for removal of coarse sediments (e.g. sediment cans, forebays, etc.). It is important to remove the large "coarse" sediments prior to entering secondary treatment as they can quickly fill in and plug up treatment vaults and infiltration systems. In addition, coarse sediments can be ground into fine particles if left on roadway surfaces.

4.1.b. Runoff Conveyance - Control urban runoff drainage patterns to reduce water caused erosion and to increase treatment options. Minimize flow volumes in individual conveyances, minimize flow velocities, and maximize discharge points where possible. Avoid concentrating runoff and decreasing drainage density.

4.1.c. Separate urban runoff from non-urban runoff. Prevent loading of treatment systems by keeping "clean" non-urban runoff separate from urban runoff that will be treated.

4.1.d Separate treated urban runoff from non-treated urban runoff. Once urban runoff has been treated it is critical to keep untreated water from contaminating treated water.

4.2. PRIMARY WATER QUALITY TREATMENT

Design and install facilities for the treatment of runoff to remove fine sediment particles and accompanying nutrients prior to entering a flowing stream or the Lake. Treatment systems should focus on the removal of fine sediment particles <16 microns in size.

4.2.a. Fine sediment particles typically need more area and a longer residence time in a basin to settle from suspension. Most existing sediment basins are too small to trap this targeted sediment size. In order for sediment basins to work effectively they need to be sized appropriately meeting the minimum residence time required to treat the identified pollutant.

4.2.b. Formulate and evaluate alternatives for maximizing load reduction. Applicants are requested to conduct an alternatives analysis including cost benefit analysis in order to determine the best design elements to include in a particular project. Implementers should refer to the *Formulating and Evaluating Alternatives for Water Quality Improvement Projects*, the *Interim Guidance Paper for Water Quality Improvement Projects* (found on the TRPA website) for guidance in developing alternatives; streamlined approaches to developing alternatives should be utilized where appropriate. In addition, the PLRM or other NDEP accepted approach should be utilized to identify maximum load reduction potentials and the preferred alternative.

5. OTHER FACTORS TO CONSIDER

Although the primary focus of projects is the reduction of FSP and accompanying nutrient loads delivered to Lake Tahoe, each project design needs to be comprehensive in nature. Projects also should be sensitive to the different community and environmental factors within the subwatersheds as well as coordinated with any other scheduled public works projects.

This includes the assessment of integrating these water quality EIP projects into other stormwater, flood and infrastructure protection in addition to private and public safety projects. Generally these types of projects are not eligible for State Lands funding.

However, case-by-case evaluation of projects allows for components directly effecting/improving water quality to be assessed for their eligibility.

In addition, major pollutant sources located outside the project boundaries should be identified and incorporated into the early planning phases (where feasible and appropriate) to insure effectiveness of the implemented project. Although funding cannot support the implementation of private BMP's, some elements of planning, design and joint-use facility implementation may be eligible for funding under this program.

As a mechanism to facilitate community participation it is strongly recommended to hold public meetings and solicit public comments.

6. OPERATIONS AND MAINTENANCE

RESPONSIBILITY/CAPACITY

A requirement of all grants is that the project proponent will maintain the project facilities in a functioning condition for a minimum of 20 years after completion of project construction. Project elements with a lifespan of longer than 20 years shall be maintained for the life of the structure. Operations and Maintenance (O & M) is the financial responsibility of the Grantee and is not eligible for funding. However, development of an Operations/Maintenance Schedule and Plan is eligible and should be included either within or as supporting documentation to the design report. The Best Management Practices Rapid Assessment Methodology (BMP RAM) should be used to guide inspection and maintenance frequencies of treatment BMPs to ensure facilities are maintained to a functional condition. Benchmark and threshold values for all stormwater treatments shall be established and documented in the maintenance plan.

Regular maintenance is necessary in order for BMPs and overall projects to achieve optimal performance. Since a project's ultimate success is viewed over a 20 year time period, regular maintenance of projects is critical to maintain efficiency. Implementers will be required to submit yearly inspection and maintenance reports.

7. STREAM ENVIRONMENT ZONES (SEZ)

7.1 RETAIN & RESTORE NATURAL GEOMORPHOLOGY, HYDROLOGY AND LANDFORM

Because of the critical importance of wetland plants in removing pollutants from runoff, projects located in stream environment zones must preserve the existing vegetation and function of the stream zones to the maximum extent possible.

7.1.a **Apply principles of fluvial geomorphology** when doing work in natural systems. Avoid adding to or decreasing natural stream flows and avoid changing watershed

boundaries. Projects which have a component relating to a natural drainage channel should include in the design process a geomorphic analysis of the stream's characteristics for use in the project design.

This analysis should include but not be limited solely to such stream morphology variables as: valley slope, channel sinuosity, meander wavelength and amplitude, radius of curvature, bankfull width and depth, bed and bank stability, confinement, particle size distribution of bedload, bankfull discharge, pool/riffle series and peak flows.

7.1.b Enhancing an SEZ - Projects should include elements to enhance or restore SEZs within the project boundaries. The removal of land coverage in SEZs is encouraged where feasible and practical.

8. POLLUTANT LOAD MODELING

Project proponents shall utilize the PLRM (or another model found to be consistent with Lake Clarity Crediting Program as determined by NDEP) for the project area to assist with project alternative development/ selection and to achieve maximum pollutant load reductions. (Personal and professional experience should also be considered as part of the alternative development and selection.) Project budgets and schedules should be developed for the inclusion of this modeling effort.

9. MONITORING

Nevada State Lands grant funds are primarily for the design and construction of site improvements. Therefore, long term monitoring is recommended **only** on selected sites which provide the best opportunities for collecting meaningful water quality data. The goal is to develop monitoring plans for projects or BMP's, while ensuring the data can be applied as broadly as possible for future project design. All monitoring should utilize the Lake Tahoe Interagency Monitoring Program (LTIMP) and Regional Stormwater Management Program (RSWMP) Monitoring Protocols (if available) as a guide. Applicants are encouraged to work closely with the DIVISION to determine the level of monitoring to implement on a specific project.

9.1 Project or BMP Effectiveness Monitoring - All monitoring will be designed to document effectiveness in reducing discharge of sediment and other pollutants to the waters of the Lake Tahoe region. Monitoring should be utilized to evaluate effectiveness of practices particularly as they relate to innovative designs and practices not previously utilized in the Tahoe Basin (pilot projects).

Photographs should be taken and visual observations recorded at each site preceding construction and for at least five years following construction. Although photographs do not provide quantifiable measurements of effectiveness, spring runoff and major rainstorms are excellent times to take photographs of

slope stabilization and revegetation areas. Quantitative methods for both vegetation and water quality analysis should be developed and assessed for in-depth monitoring plans that address both temporal and spatial effects of precipitation, discharge and runoff.

References

Tahoe Bond Act Revegetation Guidelines; Michael Hogan, 1999

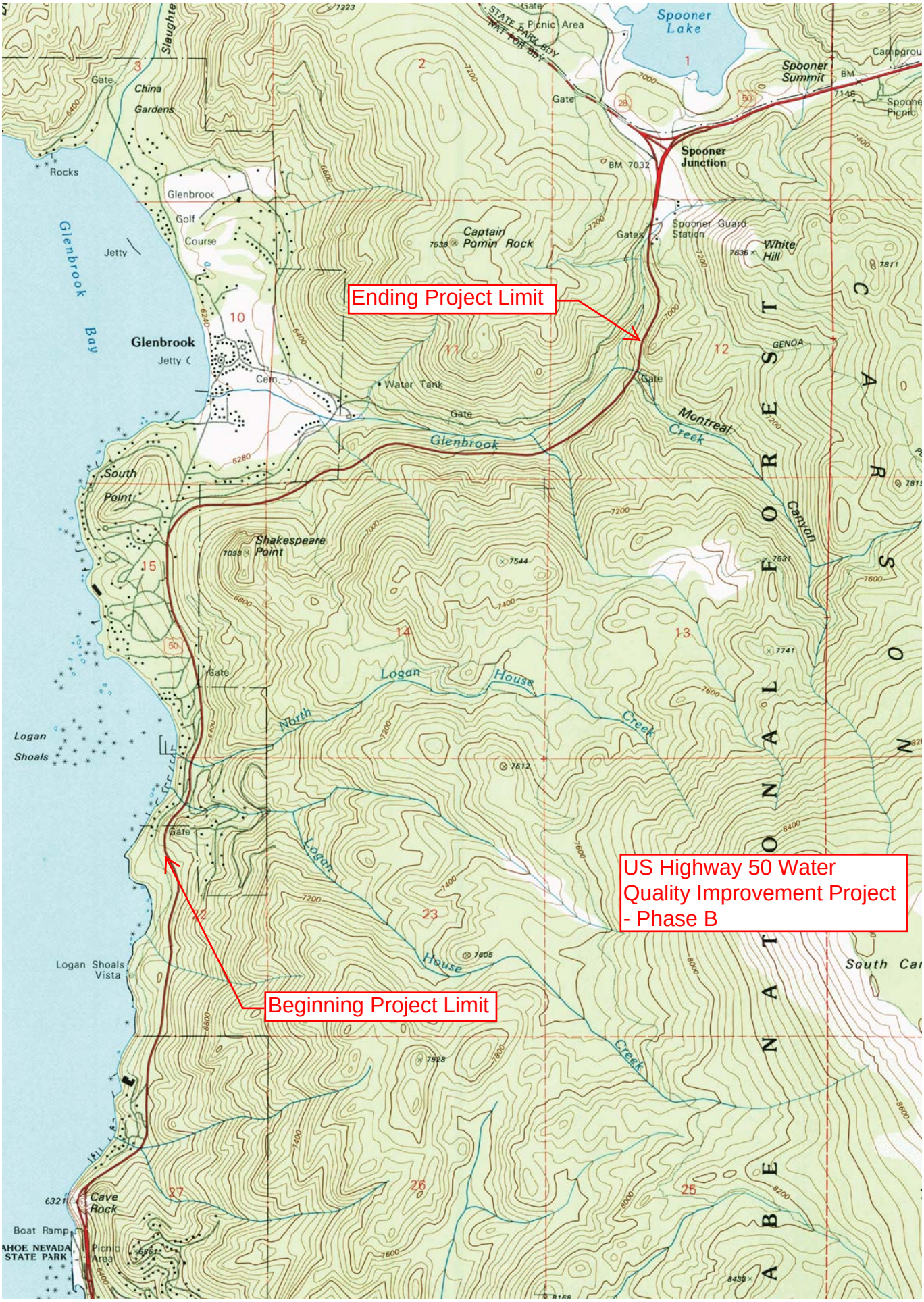
California Tahoe Conservancy Draft Guidelines 2001

Guidance Manual: Stormwater Monitoring Protocols (Revised). California Department of Transportation. May, 2000.

Lake Tahoe Watershed Assessment Volume I. U.S. Department of Agriculture, U.S. Forest Service 2000.

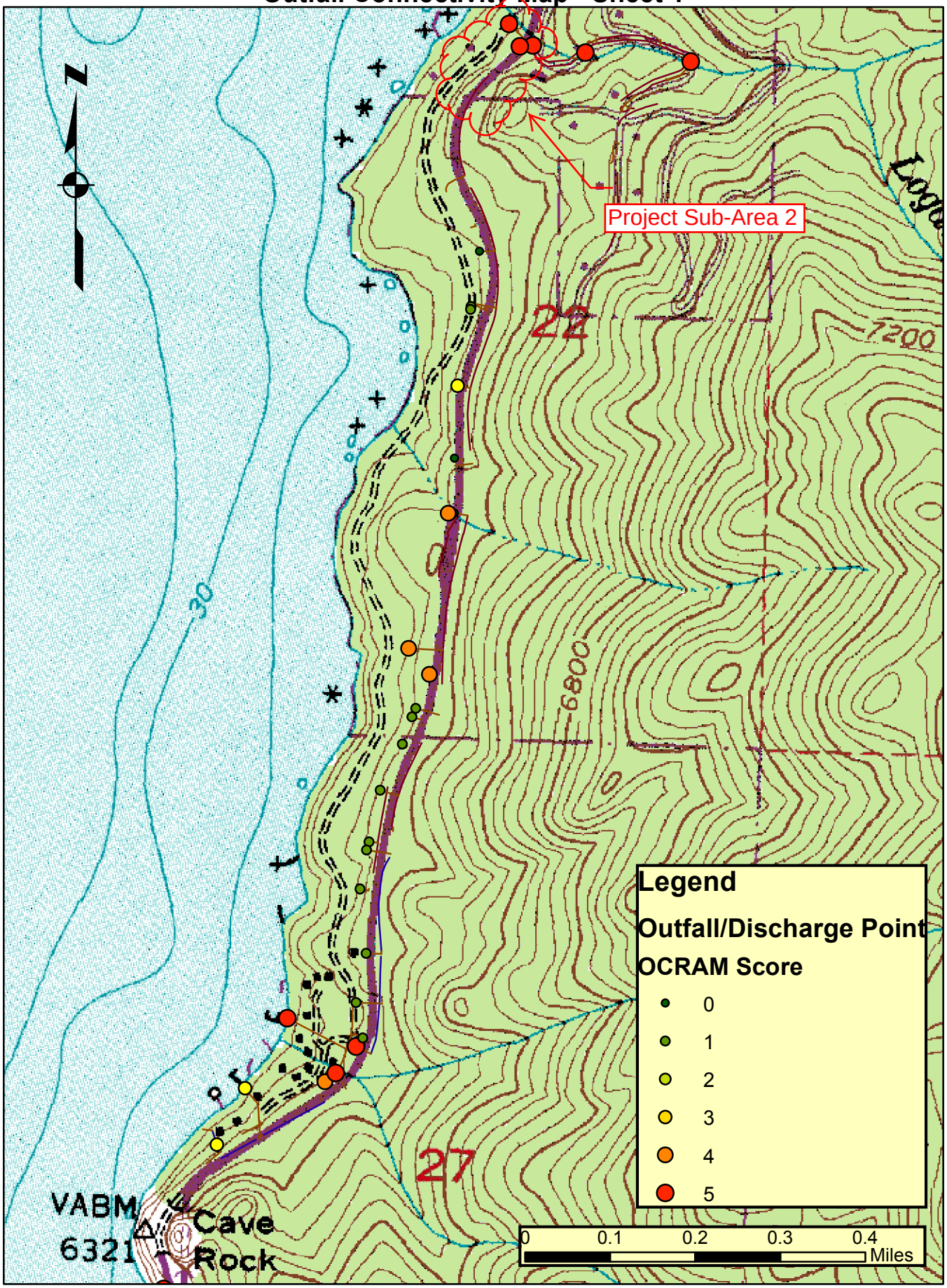
Water Quality Management Plan for the Lake Tahoe Region (208 plan). TRPA, 1988.

"ATTACHMENT A"



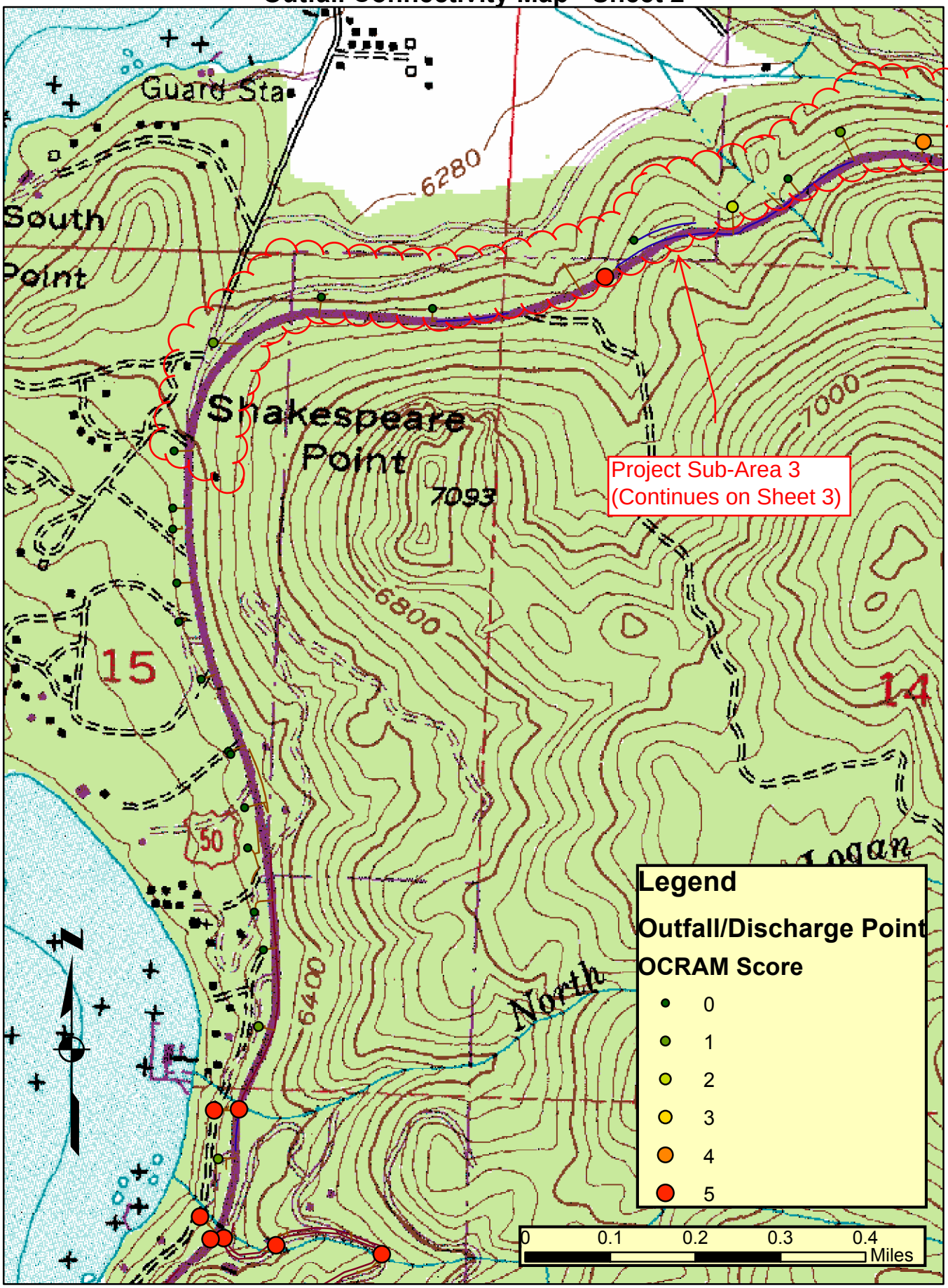
"ATTACHMENT A"

US Highway 50 Water Quality Improvement Project - Package B
Outfall Connectivity Map - Sheet 1



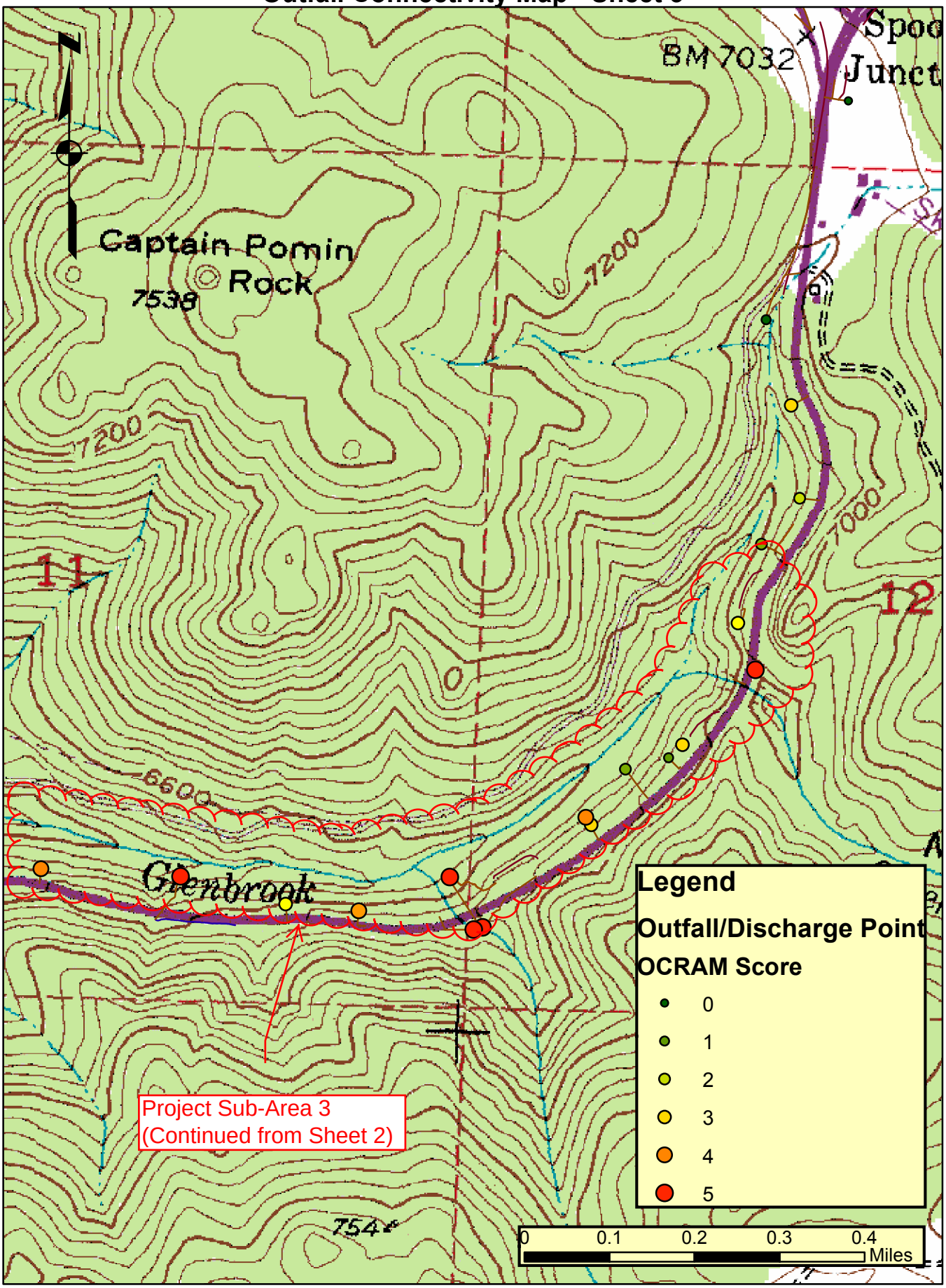
"ATTACHMENT A"

US Highway 50 Water Quality Improvement Project - Package B
Outfall Connectivity Map - Sheet 2



"ATTACHMENT A"

US Highway 50 Water Quality Improvement Project - Package B
Outfall Connectivity Map - Sheet 3



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
ENGINEER'S ESTIMATE

MASTER PROJECT NUMBER: 73653
CONTRACT NO: PROJECT ID: 73653
FUNCTIONAL CLASS:
PROJECT NUMBER: SPF-050-1(040)
LOCATION: US 50 FROM CAVE ROCK TO SR 28 SPOONER JUNCTION.

COUNTY: DOUGLAS
DEMOGRAPHY:
ROUTE SECTION: MILE POST: TO:
CONTRACTOR: TO BE CONTRACTED
DESIGNER: KIMBERLY DIEGLE PHONE: (775)834-8498

CONSTRUCTION TYPE CODE: Y009 EROSION CONT

BREAKOUT DESCRIPTION: HYDRAULIC IMPROVEMENTS

BREAKOUT NO: 01 C1C 9490 CONTR COUNTY: DOUGLAS
FROM STATION: TO STATION:
GASB34: OTHER

UNIT OF WORK	QUANTITY	UNIT MEAS	DESCRIPTION	* UNIT PRICE	ITEM COST
1100050	500.000	HOUR	TRAINING	0.80	400.00
2020285	10.000	LINFT	REMOVAL OF CULVERT PIPE	80.00	800.00
2020400	420.000	LINFT	REMOVAL OF CONCRETE BARRIER RAIL	22.00	9,240.00
2020475	176.000	LINFT	REMOVAL OF GUARDRAIL	20.00	3,520.00
2020565	307.000	LINFT	REMOVAL OF RETAINING WALL	50.00	15,350.00
2021040	7.000	EACH	REMOVAL OF DROP INLET	1,000.00	7,000.00
2021255	550.000	LINFT	REMOVAL OF TEMPORARY PORTABLE PRECAST CONCRETE BARRIER RA	8.00	4,400.00
2030140	3979.120	CUYD	ROADWAY EXCAVATION	40.00	159,164.80
2030160	757.800	CUYD	DRAINAGE EXCAVATION	40.00	30,312.00
2060110	535.300	CUYD	STRUCTURE EXCAVATION	48.00	25,694.40
2070110	377.300	CUYD	GRANULAR BACKFILL	60.00	22,638.00
2090130	52.500	CUYD	TYPE 2 DRAIN BACKFILL	80.00	4,200.00
2110100	39.100	CUYD	TOPSOIL	50.00	1,955.00
2110260	1.000	ACRE	HYDRO-SEEDING	7,000.00	7,000.00
2120040	226.900	SQYD	AESTHETIC PATTERNING	50.00	11,345.00
2120045	518.600	SQYD	PAINTING	20.00	10,372.00

"ATTACHMENT B"

3020140	4649.570	CUYD	TYPE 1 CLASS B AGGREGATE BASE	40.00	185,982.80
3020200	63.000	CUYD	TYPE 2 CLASS B AGGREGATE BASE	60.00	3,780.00
4020100	318.700	SQYD	PLANTMIXING MISCELLANEOUS AREAS	20.00	6,374.00
4020180	2237.450	TON	PLANTMIX SURFACING (TYPE 2)(WET)	110.00	246,119.50
5020120	3937.000	LINFT	CONCRETE BARRIER RAIL (MODIFIED)	50.00	196,850.00
5020750	67.700	CUYD	CLASS AA CONCRETE (MINOR)	1,500.00	101,550.00
5050100	1196.000	POUND	REINFORCING STEEL	3.00	3,588.00
6040205	41.000	LINFT	12-INCH CORR. METAL PIPE (16 GAGE)	70.00	2,870.00
6040280	31.000	LINFT	18-INCH CORR. METAL PIPE (16 GAGE)	80.00	2,480.00
6040390	6.000	LINFT	24-INCH CORR. METAL PIPE (16 GAGE)	150.00	900.00
6040545	52.000	LINFT	36-INCH CORR. METAL PIPE (16 GAGE)	175.00	9,100.00
6050140	369.000	LINFT	12 - INCH HIGH DENSITY POLYETHYLENE PIPE, TYPE S	60.00	22,140.00
6050160	5.000	LINFT	18 - INCH HIGH DENSITY POLYETHYLENE PIPE, TYPE S	160.00	800.00
6080230	2.000	EACH	ANCHOR ASSEMBLY (12-INCH)	450.00	900.00
6090850	2.000	EACH	STORMWATER TREATMENT VAULT (TYPE B)	65,000.00	130,000.00
6091030	540.000	POUND	CASTINGS	4.00	2,160.00
6091040	6933.000	POUND	STRUCTURAL STEEL GRATES	3.00	20,799.00
6091742	895.000	LINFT	24-INCH PIPE LINER	200.00	179,000.00
6091755	231.000	LINFT	30-INCH PIPE LINER	250.00	57,750.00
6100050	2208.000	SQYD	GEOTEXTILE (CLASS 1)	2.50	5,520.00
6100170	524.000	CUYD	RIPRAP (CLASS 150)	80.00	41,920.00
6100190	16.000	CUYD	RIPRAP (CLASS 300)	85.00	1,360.00
6100210	158.000	CUYD	RIPRAP (CLASS 550)	57.33	9,058.14
6100460	114.000	CUYD	RIPRAP BEDDING,(CLASS 150)	60.00	6,840.00
6100470	5.000	CUYD	RIPRAP BEDDING,(CLASS 300)	300.00	1,500.00
6100570	876.900	SQYD	EROSION CONTROL MAT	15.00	13,153.50
6130850	2948.000	LINFT	CLASS AA CONCRETE CURB AND GUTTER (TYPE 6)	22.00	64,856.00
6180350	4.000	EACH	GUARDRAIL TERMINAL (FLARED)	2,500.00	10,000.00
6180390	4.000	EACH	GUARDRAIL-BARRIER RAIL CONNECTION	2,500.00	10,000.00
6180550	113.000	LINFT	GALVANIZED GUARDRAIL (TRIPLE CORRUGATION)	40.00	4,520.00
6190200	95.000	EACH	GUIDE POSTS (RIGID)	40.00	3,800.00
6190280	13.000	EACH	OBJECT MARKERS, TYPE 3	100.00	1,300.00
6240140	80.000	DAY	TRAFFIC CONTROL SUPERVISOR	450.00	36,000.00
6250050	80.000	DAY	RENT TRAFFIC CONTROL DEVICE MAINTENANCE	100.00	8,000.00
6250140	47.000	EACH	RENT TRAFFIC CONES	45.00	2,115.00
6250230	4.000	EACH	RENT CHANGEABLE MESSAGE SIGN	4,000.00	16,000.00
6250270	2.000	EACH	RENT ARROW BOARD (TYPE C)	3,250.00	6,500.00
6250310	22.000	EACH	RENT TRAFFIC DRUMS	65.00	1,430.00

"ATTACHMENT B"

6250360	2.000	EACH	RENT TEMPORARY IMPACT ATTENUATOR	4,500.00	9,000.00
6250420	1.000	EACH	RENT TRUCK-MOUNTED IMPACT ATTENUATOR	15,000.00	15,000.00
6250500	265.000	SQFT	RENT CONSTRUCTION SIGNS	15.00	3,975.00
6250510	2000.000	LINFT	RENT PORTABLE PRECAST CONCRETE BARRIER RAIL	10.00	20,000.00
6270190	103.500	SQFT	PERMANENT SIGNS (GROUND MOUNTED) (METAL SUPPORTS)	80.00	8,280.00
6270240	103.500	SQFT	PERMANENT SIGNS, REMOVE	13.00	1,345.50
6280120	1.000	LS	MOBILIZATION	107,727.76	107,727.76
6320590	1.750	MILE	WATERBORNE PAVEMENT STRIPING (TYPE II) (6-INCH SOLID WHITE)	1,500.00	2,625.00
6370190	1.000	LS	DUST CONTROL	2,693.19	2,693.19
6370260	127.000	LINFT	SILT FENCE	5.00	635.00
6370280	216.000	LINFT	SEDIMENT LOG	5.00	1,080.00
6370290	34.000	EACH	ROADWAY INLET PROTECTION	85.00	2,890.00
6370310	9.000	EACH	GRAVEL BAG	25.00	225.00
				SUBTOTAL:	**1,905,883.59**
				CONTINGENCY (10.00%)	190,588.36
7360013	1.000	LS	ASPHALT ESCALATION	0.00	0.00
7360016	1.000	LS	FUEL ESCALATION	19,058.84	19,058.84
7360020	1.000	LS	PARTNERING	7,500.00	7,500.00
7360040	1.000	LS	INCIDENTAL CONSTRUCTION	40,000.00	40,000.00
				TOTAL COST:	**$2,163,030.79**

COUNTY: DOUGLAS

PRIMARY AMOUNT: STATE FUNDS	(E10) AT (100.00%)	2,442,094.00
MATCHING AMOUNT:		0.00
	SUBTOTAL:	$2,442,094.00
	TOTAL:	**$2,442,094.00**

"ATTACHMENT B"

Breakout No	Construction Type	Description	County	Breakout Total	CE Amount
01	Y009	EROSION CONTROL/SLOPE PROTECTION	DOUGLAS	2,163,030.79	324,454.62
				2,163,030.79	324,454.62

"ATTACHMENT B"

CONSTRUCTION TYPE CODE: CENG CONSTRUCTION

BREAKOUT DESCRIPTION: CONSTRUCTION ENGINEERING BY STATE FORCES @ 15%

BREAKOUT NO: C0 CEN 9490 CENG
FROM STATION:
GASB34: BLANK

COUNTY: DOUGLAS
TO STATION:

UNIT OF WORK	QUANTITY	UNIT MEAS	DESCRIPTION	* UNIT PRICE	ITEM COST
7340103	1.000	LS	CONSTRUCTION ENGINEERING (STATE FORCES)	324,454.62	324,454.62
				TOTAL COST:	**$324,454.62**

COUNTY: DOUGLAS

PRIMARY AMOUNT: STATE FUNDS (E10) AT (100.00%) 298,511.00
MATCHING AMOUNT: 0.00
SUBTOTAL: $298,511.00

TOTAL: **$298,511.00**

"ATTACHMENT B"

F	BREAKOUT PGPR	NO	CONSTRUCTION_CODE	COUNTY	TOTAL	WORK BY CONTRACTOR_	WORK BY OTHER	WORK BY UTILITY	CONSTRUCTION ENGINEERING	PRELIMINARY ENGINEERING	RIGHT OF WAY
S	E10	01	Y009 - EROSION CONT	DO	2,442,094.00	2,442,094.00					
			TOTAL CONSTRUCTION ITEM COSTS		2,442,094.00	2,442,094.00					
			TOTAL CONSTRUCTION ITEM + UTILITY COSTS		2,442,094.00	2,442,094.00					
S	E10	C0	CENG - CONSTRUCTION	DO	298,511.00				298,511.00		
			TOTAL CONSTRUCTION ENGINEERING COSTS		298,511.00				298,511.00		
			TOTAL CONSTRUCTION COSTS		2,740,605.00	2,442,094.00			298,511.00		
			TOTAL COSTS		**2,740,605.00**	**2,442,094.00**			**298,511.00**		

"ATTACHMENT B"

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
ENGINEER'S ESTIMATE

FT	PGPR	APPROPRIATION DESCRIPTION	TOTAL	WORK BY CONTRACTOR	WORK BY OTHER	WORK BY UTILITY	CONSTRUCTION ENGINEERING	PRELIMINARY ENGINEERING	RIGHT OF WAY
S	E10		2,740,605.00	2,442,094.00			298,511.00		
		TOTAL STATE AMOUNT	**2,740,605.00**	**2,442,094.00**			**298,511.00**		
		TOTAL COSTS	**2,740,605.00**	**2,442,094.00**			**298,511.00**		

"ATTACHMENT B"