DOC # 0764425
05/28/2010 08:43 AM Deputy: PK
OFFICIAL RECORD
Requested By:
DC/COMMUNICATIONS MANAGER

Douglas County - NV
Karen Ellison - Recorder
Page: 1 Of 78 Fee: 0.00
BK-0510 PG- 5685 RPTT: 0.00

Assessor's Parcel Number: N/A

Date: MAY 26, 2010

Recording Requested By:

Name: JEANE COX, COMMUNITY DEVELOPMENT

Address:

City/State/Zip:

Real Property Transfer Tax: $ N/A

AGREEMENT #2010.121
(Title of Document)

This page added to provide additional information required by NRS 111.312 Sections 1-2. (Additional recording fee applies)
This cover page must be typed or legibly hand printed.

APPROVED APRIL 15, 2010 ITEM #9
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A Project Funding Agreement Between the State of Nevada Acting By and Through Its Division of State Lands and the Fund to Protect Lake Tahoe (Grantor)

901 South Stewart Street, Suite 5003
Carson City, NV 89701
phone: (775) 684-2720
Fax: (775) 684-2721

And

Douglas County – Community Development-Engineering
(Grantee)

1594 Esmeralda Avenue
P.O. Box 218
Minden, NV 89423
phone: (775) 782-9063
Fax: (775) 782-6297

WHEREAS; Nevada's legislature in 1999 authorized the issuance of general obligation bonds in the face amount of $56,400,000 between July 1, 1999 and June 30, 2007 and extended this date to 2010 in the 2007 session to carry out a portion of the State's share of the Environmental Improvement Program; and
WHEREAS the Nevada legislature authorized the state land registrar to establish a program for the protection of the Lake Tahoe Basin including without limitation: air and water quality; restoration and protection of natural watercourses, wetlands, fisheries, vegetation and forests, prevention and control of erosion and the enhancement of recreational and tourism opportunities in the basin; and
WHEREAS, NRS 321.5956(3) authorizes the state land registrar to enter into a funding agreement or other agreement, within the limits of available money, with non-profit organizations, and other persons or entities to carry out a program to preserve, restore and enhance the natural environment of the Lake Tahoe Basin; and
WHEREAS, programs to enhance, preserve and restore the natural environment of the Lake Tahoe basin may be conducted on public property and privately owned property with the consent of the owner of the property as long as public money is only expended for a public purpose and the public interest is adequately protected; and
WHEREAS, the state land registrar has determined this project is both necessary and in the best interests of the natural environment at Lake Tahoe;

NOW, THEREFORE, in consideration of the aforesaid premises, the parties mutually agree as follows:

1. REQUIRED APPROVAL. This Funding Agreement shall not become effective until and unless approved by the state land registrar and the authorized Douglas County representative.
2. DEFINITIONS. "Grantor" means the State of Nevada and the Division of State Lands, its officers and employees.
3. FUNDING AGREEMENT TERM. This Funding Agreement shall be effective from February 24, 2010 to December 31, 2011, unless sooner terminated by either party as specified in paragraph 9 herein.
4. NOTICE. All notices or other communications required or permitted to be given under this Funding Agreement shall be in writing and shall be deemed to have been duly given if delivered personally in hand, by telephonic facsimile with simultaneous regular mail, or mailed certified mail, return receipt requested, postage prepaid on the date posted, and addressed to the other party at the address specified above.
5. INCORPORATED DOCUMENTS. The parties agree that the responsibilities, and duties of each party as well as the scope of the project shall be specifically described; this Funding Agreement incorporates the following attachments in descending order of constructive precedence;

ATTACHMENT A: Warrior Way Water Quality Improvement Project (FTPLT 10-002) – Summary & Special Conditions

ATTACHMENT B: Tahoe Bond Act Regulations – LCB File No. R0004-02, NAC 321.335-360.

ATTACHMENT C: Tahoe Bond Act Revegetation Guidelines

ATTACHMENT D: Original and amended Grant Applications submitted by Mahmood Azad, P.E., County Engineer, Douglas County Community Development, November 10, 2009 and December 4, 2009, respectively, and Preliminary Sediment Calculations and Cost Estimates

6. COST: Grantor agrees to provide a maximum of 50% of the funds actually expended and necessary for the construction and completion of the described project contingent upon Grantee's compliance with all of the terms and conditions herein. See attachments A and D hereto, for description. Grantor will also assess 3% of the total project cost (Design and construction) for administering the grant program. Grantee is required to provide a minimum of 50% of the total project cost as its local share as required by NAC 321.360.

7. ASSENT. The parties agree that the terms and conditions listed on incorporated attachments of this Funding Agreement are also specifically a part of this Funding Agreement and are limited only by their respective order of precedence and any limitations specified.

8. INSPECTION & AUDIT.

a. Books and Records. Grantee agrees to keep and maintain under general accepted accounting principles (GAAP) full, true and complete records, contracts, books, and documents as are necessary to fully disclose to Grantor, or its authorized representatives, upon audits or re views, sufficient information to determine compliance with all state and federal regulations and statutes.

b. Inspection & Audit. Grantee agrees that the relevant books, records (written, electronic, computer related or otherwise), including, without limitation, relevant accounting procedures and practices, financial statements and supporting documentation shall be subject, at any reasonable time, to inspection, examination, review, audit, and copying at any office or location of Grantee where such records may be found by Grantor's designated representative.

c. Period of Retention. All books, records, reports, and statements relevant to this Funding Agreement must be retained a minimum of three years. The retention period runs from the date of Grantor's last grant payment, or from the date of termination of the Funding Agreement, whichever is later. Retention time shall be extended when an audit is scheduled or in progress for a period reasonably necessary to complete an audit and/or to complete any administrative and judicial litigation which may ensue.

9. FUNDING AGREEMENT TERMINATION.

a. This Funding Agreement is subject to and contingent upon sufficient funds being appropriated, budgeted, and otherwise made available by the State Legislature. The State may terminate this Funding Agreement, and Grantee waives any and all claim(s) for damages, effective immediately upon receipt of written notice (or any date specified therein) if for any reason the funding from State is not appropriated or is withdrawn, limited, or impaired.

b. Grantor may only terminate this project agreement as specified in paragraph 17 of the incorporated attachment A, the project funding agreement. If any state, county, city or federal license, authorization, waiver, permit, qualification or certification required by statute, ordinance, law, or regulation to be held by Grantee to provide the goods or services required by this Funding Agreement is for any reason denied, revoked, debarred, excluded, terminated, suspended, lapsed, or not renewed; or if Grantee becomes insolvent, subject to receivership, or becomes voluntarily or involuntarily subject to the jurisdiction of the bankruptcy court; or if it is found by the State that any quid pro quo or gratuities in the form of money, services, entertainment, gifts, or otherwise were offered or given by Grantee, or any agent or representative of Grantee, to any officer or employee of the State of Nevada with a view toward securing a funding agreement or securing favorable treatment with respect to awarding, extending, amending, or making any determination with respect to the performing of such funding agreement, then this funding agreement may be immediately terminated by the Grantor.

i. Time to Correct. Termination upon a declared default or breach may be exercised only after service of formal written notice as specified in paragraph (4), and the subsequent failure of the defaulting party within 30 calendar days of receipt of that notice to provide evidence, satisfactory to the aggrieved party, showing that the declared default or breach has been corrected.

ii. Winding Up Affairs Upon Termination. In the event of termination of this Funding Agreement for any reason, the parties agree that the provisions of this paragraph survive termination:

aa. The parties shall account for and properly present to each other all claims for fees and expenses and pay those which are undisputed and otherwise not subject to set off under this Funding Agreement. Neither party may withhold performance of winding up provisions solely based on nonpayment of fees or expenses accrued up to the time of termination;

bb. Grantee shall satisfactorily complete work in progress at the agreed rate (or a pro rata basis if necessary) if so requested by the Grantor;

cc. Grantee shall execute any documents and take any actions necessary to effectuate an assignment of this Funding Agreement if so requested by the Grantor;

10. REMEDIES. Except as otherwise provided for by law or this Funding Agreement, the rights and remedies of the parties shall not be exclusive and are in addition to any other rights and remedies provided by law or equity, including, without limitation, actual damages, and to a prevailing party reasonable attorneys' fees and costs. It is specifically agreed that reasonable attorneys' fees shall include without limitation $125 per hour for State-employed attorneys. The State may set off consideration against any unpaid obligation of Grantee to any State agency.

11. LIMITED LIABILITY. The State will not waive and intends to assert available NRS chapter 41 liability limitations in all cases.

12. FORCE MAJEURE. Neither party shall be deemed to be in violation of this Funding Agreement if it is prevented from performing any of its obligations hereunder due to strikes, failure of public transportation, civil or military authority, act of public enemy, accidents, fires, explosions, or acts of God, including, without limitation, earthquakes, floods, winds, or storms. In such an event the intervening cause must not be through the fault of the party asserting such an excuse, and the excused party is obligated to promptly perform in accordance with the terms of the Funding Agreement after the intervening cause ceases.

13. INDEMNIFICATION. To the fullest extent permitted by law, Grantee shall indemnify, hold harmless and defend, not excluding the State's right to participate, the State from and against all liability, claims, actions, damages, losses, and expenses, including, without limitation, reasonable attorneys' fees and costs, arising out of any alleged negligent or willful acts or omissions of Grantee, its officers, employees and agents for this funding agreement.

14. WAIVER OF BREACH. Failure to declare a breach or the actual waiver of any particular breach of the Funding Agreement or its material or nonmaterial terms by either party shall not operate as a waiver by such party of any of its rights or remedies as to any other breach.

15. SEVERABILITY. If any provision contained in this Funding Agreement is held to be unenforceable by a court of law or equity, this Funding Agreement shall be construed as if such provision did not exist and the nonenforceability of such provision shall not be held to render any other provision or provisions of this Funding Agreement unenforceable.

16. ASSIGNMENT. Grantee shall neither assign, transfer nor delegate any rights, obligations or duties under this Funding Agreement without the prior written consent of the State.

17. PUBLIC RECORDS. Pursuant to NRS 239.010, information or documents received from Grantee may be open to public inspection and copying. The State will have the duty to disclose unless a particular record is made confidential by law or a common law balancing of interests.

18. FEDERAL FUNDING. In the event federal funds are used for payment of all or part of this Funding Agreement:

a. Grantee certifies, by signing this Funding Agreement, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency. This certification is made pursuant to the regulations implementing Executive Order 12549, Debarment and Suspension, 28 C.F.R. pt. 67, § 67.510, as published as pt. VII of the May 26, 1988, Federal Register (pp. 19160-19211), and any relevant program-specific regulations. This provision shall be required of every subcontractor receiving any payment in whole or in part from federal funds.

b. Grantee shall comply with all terms, conditions, and requirements of the Americans with Disabilities Act of 1990 (P.L. 101-136), 42 U.S.C. 12101, as amended, and regulations adopted thereunder contained in 28 C.F.R. 26.101-36.999, inclusive, and any relevant program-specific regulations.

c. Grantee shall comply with the requirements of the Civil Rights Act of 1964, as amended, the Rehabilitation Act of 1973, P.L. 93-112, as amended, and any relevant program-specific regulations, and shall not discriminate against any employee or offeror for employment because of race, national origin, creed, color, sex, religion, age, disability or handicap condition (including AIDS and AIDS-related conditions.)

19. PROPER AUTHORITY. The parties hereto represent and warrant that the person executing this Funding Agreement on behalf of each party has full power and authority to enter into this Funding Agreement. Contractor

acknowledges that as required by statute or regulation this Funding Agreement is effective only after approval by the Division of State Lands Administrator and only for the period of time specified in the Funding Agreement. Any services performed by Grantee before this Funding Agreement is effective or after it ceases to be effective are performed at the sole risk of Grantee.

20. GOVERNING LAW; JURISDICTION. This Funding Agreement and the rights and obligations of the parties hereto shall be governed by, and construed according to, the laws of the State of Nevada. Grantee consents to the jurisdiction of the Nevada district courts for enforcement of this Funding Agreement.

21. ENTIRE FUNDING AGREEMENT AND MODIFICATION. This Funding Agreement and its integrated attachment(s) constitute the entire agreement of the parties and such are intended as a complete and exclusive statement of the promises, representations, negotiations, discussions, and other agreements that may have been made in connection with the subject matter hereof. Unless an integrated attachment to this Funding Agreement specifically displays a mutual intent to amend a particular part of this Funding Agreement, general conflicts in language between any such attachment and this Funding Agreement shall be construed consistent with the terms of this Funding Agreement. Unless otherwise expressly authorized by the terms of this Funding Agreement, no modification or amendment to this Funding Agreement shall be binding upon the parties unless the same is in writing and signed by the respective parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused this Funding Agreement to be signed and intend to be legally bound thereby.

James R. Lawrence, Nevada Division of State Lands	2/25/10	Administrator	
Grantee Signature	April 15, 2010	Chairman	

ATTACHMENT A

Water Quality Improvement Project (FTPLT10-002)
Summary & Special Conditions

GRANTEE: Douglas County Community Development Project Number FTPLT 10-002

Project Title: Warrior Way Water Quality Improvement Project

Period Covered By This Agreement: February 25, 2010-December 31, 2011

Tax ID Number: 88 6000031

Project Cost:

A.	Estimated Project Cost (Design and Construction)	$1,210,814.00
B.	Local Share of Project Cost (50% of A)	$ 605,407.00
C.	State Share of Project Cost (25% of A)	$ 605,407.00
D.	State Share of Administration costs (3% of A)	$ 36,324.42
E.	**Total State Grant (C plus D)**	**$ 641,731.42**

Refer to A: Design and Construction Costs are currently estimated at $1,210,814.00.

Refer to B: Douglas County is responsible for 50% of the ACTUAL costs of the design and construction of the project. This is currently estimated to be $605,407. However, the 50% minimum match requirement will adjust to actual expenditures of the project design and construction.

Refer to C: The State is responsible for 50% of the ACTUAL costs of design and construction. This is currently estimated to be $605,407.00. However, the 50% will adjust to actual expenditures of the project design and construction, not to exceed $605,407.00 unless grant is amended by the State.

Refer to D: Administrative costs – 3% of Project Cost, is estimated at $36,324.42. The County is not required to match any portion of this 3%. These administrative costs will adjust to actual expenditures of the project design and construction, not to exceed $36,324.42 unless grant is amended by the State. The County will receive 3% of the total costs of the Project to aid in covering administrative costs of the County directly related to this project.

Project Scope (Brief Description of Project)

This project will address stormwater quality issues for the Warrior Way right-of-way in Douglas County, Nevada. Warrior Way is a heavily traveled roadway treated with significant road abrasives in the winter and located only 550 feet from Lake Tahoe. Stormwater currently overwhelms existing stormwater treatment systems in place for the Zephyr Cove Elementary School and the Nevada Department of Transportation. It is anticipated that the project will include source control measures such as shoulder stabilization improvements as well as conveyance improvements, catch basins, and the development of infiltration areas on public lands for treatment. The latest Total Maximum Daily Load tools will be utilized for the planning of this project.

TERMS AND CONDITIONS

In addition to the terms and conditions listed on pages 1-4, the GRANTOR & GRANTEE mutually agree to perform this Agreement with the terms, promises, conditions, plans, specifications, estimates, procedures, project proposals, maps and assurances attached hereto and hereby made a part hereof.

1. In the event the GRANTEE does not make available to the DIVISION all necessary information to finalize the project agreement within (6) months from the beginning date of this Agreement; this Agreement is null and void.

2. The GRANTEE hereby promises, in consideration of the promises made by the DIVISION herein, to execute the project described above in accordance with the terms of the Agreement.

3. The Project shall be operated and maintained by the GRANTEE for at least 20 (twenty) years after Project completion. Project elements lasting longer than 20 years shall be maintained for the life of the structure. The GRANTEE shall submit a yearly maintenance report that identifies the facilities maintained (including number of times per year), volume of material removed and general breakdown of maintenance costs. The DIVISION may require repayment of a pro-rata share of the grant amount for any period of time that the project will not perform within design criteria and specifications due to a lack of maintenance.

4. Work performed prior to the period specified in the "Project Agreement" may be eligible for reimbursement through Tahoe Bond Act provided:

   a. The applicant provides documentation detailing the work performed;
   b. The applicant provides documentation that the work performed related directly towards project implementation;
   c. The work performed is considered eligible for reimbursement per regulations NAC 321.300 through NAC 321.365; and
   d. The total grant amount specified in the project agreement does not increase.

5. The DIVISION shall receive as-built drawings completed by the Applicant showing all facilities and structures constructed as part of the Project including summary report with information requested by either the DISTRICT or DIVISION. This information will need to be submitted electronically in CAD format, in addition to the hard copy.

6. Requests for funds exceeding this grant amount requires an amendment to this agreement and must be approved by the State Lands Registrar. Requests for funds that exceed 25 (twenty-five) percent of the original grant amount will also require the review of the Tahoe Bond Act Technical Advisory Committee including the Nevada Tahoe Conservation District Board of Supervisors.

7. Grant payments are on a reimbursement basis only. Requests for reimbursements must utilize the "Outlay Report and Request for Reimbursement For Construction Program" provided by the DIVISION. All reimbursements must include supporting documentation, including, but not limited to, invoices, receipts details outlining the basis for the expenditures, and the signature of the official responsible for approving the expenditures. The DIVISION reserves the right to request any additional information, related to project expenses that the DIVISION determines is necessary to process a grant payment.

8. The DIVISION may audit project records or it's designate. All records must be retained a minimum of 3 (three) years after the completion of work on the Project. The DIVISION reserves the right to require that the records be kept for a longer period of time.

9. The DIVISION and Nevada Tahoe Conservation District (District) will be invited to attend all major project issue meetings.

Division of State Lands
Attn: Elizabeth Harrison
Water Quality Program Manager
901 S Stewart St, Suite 5003
Carson City, NV 89701
(775) 684-2736

Nevada-Tahoe Conservation District
Attn: Michael Pook
Water Quality Program Manager
P.O. Box 915
Stateline NV 89448
(775) 586-1610

10. The DIVISION will be notified immediately of any changes regarding the cost of the project or the scope of work.

11. The GRANTEE is responsible for obtaining all permits, easements and other private and governmental agency approvals required for the Project prior to the commencement of construction.

12. To the fullest extent permitted by law, the GRANTEE agrees 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 GRANTEE, its officers, employees and agents.

13. The failure of either party to enforce any provision of the Agreement shall not be construed as a waiver of limitation of that party's right to subsequently enforce and compel strict compliance with every provision of this Agreement.

14. This Agreement may be modified or amended if the amendment is made in writing and is signed by both parties.

15. If any provision of this Agreement shall be held to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any provision of the Agreement is invalid or unenforceable, but that by limiting such provision it would become valid and enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.

16. Termination

The DIVISION may terminate this Agreement for reason of default by the GRANTEE. Any of the following events shall constitute default:

a. Termination of the grant by reason or fault of the GRANTEE;
b. Failure by the GRANTEE to observe any of the covenants, conditions, or warranties of this Agreement and its incorporated provisions;
c. Failure by the GRANTEE to make progress on the project within the Period covered by this agreement;
d. Unsatisfactory financial conditions of the GRANTEE which endanger the performance of the grant; and/or
e. Delinquency by the GRANTEE in payments to contractors, except for those payments to contractors which are being contested in good faith by the GRANTEE.
f. If the Project is not completed, the GRANTEE is required to reimburse the DIVISION for funds expended for those portions of the Project that will not stand on their own, as determined by the DIVISION.
g. The DIVISION shall give notice to the GRANTEE if the GRANTEE is in default in the performance of any of the duties of the GRANTEE described in this agreement. The GRANTEE shall have 30 days from receipt of notice to remedy the default, and if the GRANTEE cannot remedy the default within such period of time, the DIVISION may terminate this agreement. The right of the DIVISION to terminate this agreement shall not impair any other rights or remedies at law or equity the DIVISION may have against the GRANTEE under this agreement or under the law. No waiver of any default by the DIVISION under this contract shall be held to be a waiver of any other subsequent default by the GRANTEE. All remedies afforded under this contract are cumulative; this is in addition to every other remedy provided therein or under the law.

17. The GRANTEE will furnish progress reports and such other information as the grantor agency may require. At a minimum the DIVISION and the DISTRICT 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% of the Project design
- Final design, including report, prior to advertisement and award of construction contract
- Completion of 25%, 50%, and 75% of construction
- Project completion prior to release of contractor

18. The GRANTEE will provide and maintain competent and adequate engineering supervision during the design phase of the project, as well as inspection at the construction site to insure that completed work conforms to the approved plans and specifications.

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

20. The GRANTEE will provide notice to area residents informing them of the project as well as the general types of practices that will be implemented.

21. The laws of the State of Nevada shall govern this Agreement.

Attachment B

PROTECTION OF LAKE TAHOE BASIN

NAC 321.300 Definitions. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) As used in NAC 321.300 to 321.365, inclusive, unless the context otherwise requires, the words and terms defined in NAC 321.305 to 321.333, inclusive, have the meanings ascribed to them in those sections.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R004-02, 3-19-2002)

NAC 321.305 "Committee" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "Committee" means the technical advisory committee established pursuant to section 7 of the "Cooperative Agreement" entered into by the division and the district on September 25, 1997.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.310 "District" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "District" means the Nevada-Tahoe Conservation District.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.315 "Division" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "Division" means the division of state lands of the department of conservation and natural resources.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.323 "Local government" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "Local government" means any political subdivision of this state, including, without limitation:

1. Counties;
2. Incorporated cities and towns, including Carson City;
3. Unincorporated towns; and
4. General improvement districts and other districts.

(Added to NAC by St. Land Registrar by R004-02, eff. 3-19-2002)

NAC 321.325 "Matching contribution" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "Matching contribution" means money or anything of value, including, without limitation, the use of personnel, materials or equipment of the applicant.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.327 "Nonprofit organization" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "Nonprofit organization" means an entity or organization that is exempt from taxation under section 501(c)(3) of the Internal Revenue Code, 26 U.S.C. § 501(c)(3).

(Added to NAC by St. Land Registrar by R004-02, eff. 3-19-2002)

NAC 321.330 "Project" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "Project" means a project that is authorized by law and may include a project for:

1. The control of erosion;
2. Treatment relating to water quality; or
3. The restoration or enhancement of natural watercourses or stream environment zones,

in the Lake Tahoe Basin.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R004-02, 3-19-2002)

NAC 321.332 "State agency" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "State agency" means any agency, department or division of the executive department of this state. The term includes the University and Community College System of Nevada.

(Added to NAC by St. Land Registrar by R004-02, eff. 3-19-2002)

NAC 321.333 "Stream environment zone" defined. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) "Stream environment zone" means an area:

1. The biological and physical characteristics of which are the result of the presence of surface or ground water; and
2. That meets the criteria for a stream environment zone set forth in Volume III, Stream Environment Zone Protection and Restoration Program in the "Water Quality Management Plan for the Lake Tahoe Region" of the Tahoe Regional Planning Agency, dated November 1988.

(Added to NAC by St. Land Registrar by R004-02, eff. 3-19-2002)

NAC 321.335 "Cooperative Agreement" adopted by reference. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001)

1. The "Cooperative Agreement" entered into by the division and the district on September 25, 1997, is hereby adopted by reference.
2. A copy of the "Cooperative Agreement" may be obtained without charge:

(a) In person, from the Division of State Lands, 333 West Nye Lane, Suite 118, Carson City, Nevada.

(b) By telephone, at (775) 687-4363 or (775) 687-4735.

(c) By mail, from the State Land Registrar, Division of State Lands, Capitol Complex, Carson City, Nevada 89710.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R022-00, 5-4-2000)

NAC 321.340 Award of grants of money; entry into contracts or agreements; matching contributions. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001)

1. The state land registrar will award grants of money from the sale of general obligation bonds of this state issued pursuant to section 1 of chapter 361, Statutes of Nevada 1995, to the department of transportation and local governments pursuant to NAC 321.300 to 321.365, inclusive. Such money must be distributed as follows:

(a) Not more than one-third of the money may be allocated to projects of the department of transportation.

(b) At least two-thirds of the money must be allocated to projects of local governments.

2. The state land registrar will, pursuant to NAC 321.300 to 321.365, inclusive:

(a) Award grants of money from the sale of general obligation bonds of this state issued pursuant to section 1 of chapter 514, Statutes of Nevada 1999, to; and

(b) Enter into contracts or agreements in accordance with section 3 of chapter 514, Statutes of Nevada 1999, as amended by section 5 of chapter 25, Statutes of Nevada 2001, with,

state agencies, local governments, nonprofit organizations and other persons or entities to carry out projects relating to water quality, the control of erosion and the restoration or enhancement of streams in the Lake Tahoe Basin.

3. An applicant for a grant of money pursuant to NAC 321.300 to 321.365, inclusive, shall provide a matching contribution to the project of not less than 25 percent of the total cost of the project, except that a state agency is not required to provide a matching contribution.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R022-00, 5-4-2000; R004-02, 3-19-2002)

NAC 321.345 Grants of money: Solicitation of applications; initial determination of eligibility; submission and contents of application. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001)

1. The state land registrar will periodically:

(a) Solicit applications from state agencies, local governments, nonprofit organizations and other persons or entities for grants of money from the sale of general obligation bonds issued pursuant to section 1 of chapter 361, Statutes of Nevada 1995, and general obligation bonds issued pursuant to section 1 of chapter 514, Statutes of Nevada 1999; and

(b) Establish deadlines for the submission of those applications.

2. Before a state agency, a local government, a nonprofit organization or any other person or entity may submit an application for a grant of money for a proposed project, the state agency, local government, nonprofit organization or other person or entity must submit a preapplication to the division for an initial determination of the eligibility of the proposed project to qualify for a grant. In making an initial determination of the

eligibility of a proposed project to qualify for a grant, the state land registrar will consider the following criteria, without limitation:

(a) Whether the proposed project is listed in the "Environmental Improvement Program" of the Tahoe Regional Planning Agency; and

(b) Whether the proposed project is of benefit to the general public as determined by the state land registrar.

Upon the initial determination by the state land registrar that a project is eligible to qualify for a grant, the applicant may submit an application for a grant of money for the proposed project.

3. An application by a local government, a nonprofit organization or any other person or entity for a grant pursuant to NAC 321.300 to 321.365, inclusive, must be submitted to the district and include, without limitation:

(a) A completed application package on forms provided by the district and approved by the division;

(b) The amount of money requested for the project;

(c) The total projected cost of the project, including, without limitation, the estimated costs for planning, design, acquisition and construction;

(d) A detailed description of the project;

(e) Proof of any title to land, lease or easement that is required to carry out the project;

(f) A map of the location of the project;

(g) A statement regarding the conformity of the project to all applicable local and regional land use plans;

(h) Evidence that the project is included within the "Environmental Improvement Program" of the Tahoe Regional Planning Agency;

(i) A plan for the operation and maintenance of the project for a period of not less than 20 years, including, without limitation, the identity of the person who will operate the project and provide the maintenance;

(j) An itemized list of the costs of the project in accordance with the descriptions of work and unit prices set forth in the "Project Cost Estimator" which is hereby adopted by reference. A copy of the "Project Cost Estimator" may be obtained without charge:

(1) In person, at the:

(I) Nevada-Tahoe Conservation District Office, 870 Emerald Bay Road, South Lake Tahoe, California; or

(II) Division of State Lands, 333 West Nye Lane, Suite 118, Carson City, Nevada;

(2) By telephone, at (530) 573-2757 or (775) 687-4363; or

(3) By mail, at the Nevada-Tahoe Conservation District Office, P.O. Box 10529, South Lake Tahoe, California 96158;

(k) A detailed description of how the project conforms to the guidelines and objectives described in the application package; and

(l) A detailed description of the environmental and public benefits of the project.

4. An application by a state agency for a grant pursuant to NAC 321.300 to 321.365, inclusive, must be submitted to the division and include, without limitation:

(a) A completed application package on forms provided by the division;

(b) The amount of money requested for the project;

(c) The total projected cost of the project, including, without limitation, the estimated costs for planning, design, acquisition and construction;

(d) A detailed description of the project;

(e) Proof of any title to land, lease or easement that is required to carry out the project;

(f) A statement regarding the conformity of the project to all applicable local and regional land use plans;

(g) Evidence that the project is included within the "Environmental Improvement Program" of the Tahoe Regional Planning Agency;

(h) A plan for the operation and maintenance of the project for a period of not less than 20 years, including, without limitation, the identity of the person who will operate the project and provide the maintenance;

(i) A detailed description of how the project conforms to the guidelines and objectives described in the application package; and

(j) A detailed description of the environmental and public benefits of the project.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R022-00, 5-4-2000; R004-02, 3-19-2002)

NAC 321.350 Evaluation and prioritization of projects. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) The district shall:

1. Evaluate the feasibility of each project for which it has received an application and evaluate its estimated costs and benefits pursuant to the criteria set forth in NAC 321.355. In its review of each project, the district shall use the technical advice of the committee.

2. Develop a preliminary list which ranks projects for which applications have been submitted in order of priority.

3. Make the preliminary list of prioritized projects available for public review.

4. Conduct at least one public hearing regarding each preliminary list of prioritized projects. The district may revise each preliminary list after the public hearing.

5. Submit a final list of prioritized projects to the state land registrar with a written evaluation of each project which addresses the criteria set forth in NAC 321.355.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R004-02, 3-19-2002)

NAC 321.355 Criteria for evaluation of projects. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) The district shall evaluate each project pursuant to the following criteria:

1. The benefit to the water quality of Lake Tahoe, including, without limitation, whether the project:

(a) Will address a significant problem relating to soil erosion or water quality or both soil erosion and water quality;

(b) Will result in a demonstrated improvement in water quality;

(c) Is listed in the "Environmental Improvement Program" of the Tahoe Regional Planning Agency; and

(d) Will reduce significantly the amount of untreated runoff that is currently being deposited in Lake Tahoe.

2. The adequacy of the design of the project, including, without limitation, whether the proposed project:

(a) Uses proven, effective and cost effective techniques to address the control of soil erosion and treatment relating to water quality;

(b) Restores, preserves and enhances vegetation and stream environment zones to the maximum extent possible;

(c) Uses improvements that reflect aesthetic considerations; and

(d) Uses bioengineering.

3. The comprehensive approach of the project, including, without limitation, whether all identifiable aspects of the problem of soil erosion and treatment relating to the water quality of the runoff in the project area or the watershed are covered in the project.

4. The long-term viability of the project, including, without limitation, the ability of the applicant to operate and maintain the project.

5. The cost effectiveness of the project, including, without limitation, the potential of the project to attract financing in addition to the grant.

6. The ability of the applicant to carry out the project in a timely manner.

7. The ability of the portion of the project that will be paid for with money from the grant to achieve benefits to water quality independently of the other components of the project.

8. The ability of the project to be used as a model for future projects, including, without limitation, whether the project:

(a) Uses biotechnology;

(b) Combines proven and innovative approaches; and

(c) Includes a monitoring program measuring the effectiveness of the project.

9. The amount of cooperation and support for the project from persons other than the applicant, including, without limitation:

(a) Federal, state and local governmental agencies; and

(b) Private landowners.

10. The amount of a matching contribution to the project that will be provided by the applicant, which must equal at least 25 percent of the cost of the project.

11. The adequacy of the plan for maintenance of the project.

12. The benefits to the public.

13. The extent that the project meets the objectives and guidelines set forth in the application package provided by the district.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R004-02, 3-19-2002)

NAC 321.360 Agreement between state land registrar and recipient of grant. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001) The state land registrar and the recipient of a grant shall enter into an agreement which must require that the recipient shall:

1. If the recipient is not a state agency, provide a matching contribution to the proposed project of not less than 25 percent of the cost of the project;

2. Operate and provide maintenance for the project for not less than 20 years after the project is completed;

3. Agree to any additional conditions determined necessary by the state land registrar to carry out the purposes of this chapter, including, without limitation, the posting of a performance bond by the applicant; and

4. Obtain such easements for conservation or other interests in land as are necessary to carry out the project. The easements must be approved by the state land registrar. The state land registrar may require that the easement for conservation or other interests in land be held by this state. As used in this subsection, "easement for conservation" has the meaning ascribed to it in NRS 111.410.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R022-00, 5-4-2000; R004-02, 3-19-2002)

NAC 321.365 Authorized and prohibited uses of grant. (§2 of ch. 361, Stats. 1995, as amended by §4 of ch. 25, Stats. 2001; §3 of ch. 514, Stats. 1999, as amended by §5 of ch. 25, Stats. 2001)

1. Except as otherwise provided in subsection 2, the recipient of a grant pursuant to NAC 321.300 to 321.365, inclusive, may use the money from the grant to pay for:

(a) All expenses related directly to the project, including, without limitation, expenses related to the design and construction of the project;

(b) Monitoring the effectiveness of projects funded pursuant to section 3 of chapter 514, Statutes of Nevada 1999, if the state land registrar determines such monitoring to be necessary; and

(c) The administrative costs of the project, not to exceed 3 percent of the total cost of the project.

2. The recipient of a grant pursuant to NAC 321.300 to 321.365, inclusive, shall not use the money from the grant to pay for:

(a) Any planning activities which are not directly related to the design and engineering of the project;

(b) The purchase of new equipment, unless the state land registrar has determined that the purchase of the new equipment is necessary to monitor the effectiveness of the project;

(c) Paving, unless the paving is recommended by the committee to remedy erosion;

(d) The acquisition of land, unless such an acquisition is determined by the state land registrar to be an integral component of the project;

(e) Any work required by a public agency as mitigation or as a condition of the approval of any other project;

(f) Any component of the project that is determined by the state land registrar not to benefit the public;

(g) Installation of best management practices on private property as required by the Tahoe Regional Planning Agency; or

(h) Any other expenses determined by the state land registrar not to be necessary to carry out the purposes of this chapter.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R004-02, 3-19-2002)

ATTACHMENT C

Objectives and Guidelines for Revegetation Success Under the Nevada Tahoe Bond Act

May 14, 1999

Prepared by: Michael Hogan

For the Nevada Tahoe Bond Act Technical Advisory Committee

Objectives and Guidelines for Revegetation Success Under The Nevada Tahoe Bond Act

May 14, 1999

Prepared by: Michael Hogan

For the Nevada Tahoe Bond Act Technical Advisory Committee

Introduction

These objectives and guidelines are set forth as suggestions for the planning and implementation of successful revegetation and restoration projects that are assisted through funding from the Nevada Tahoe Bond Act of 1996. While these objectives and guidelines are aimed specifically at uplands projects, all of the objectives and most of the guidelines can be applied to riparian projects and all but Objective Seven can be applied to wetlands projects. This document is not intended to provide a specific formula from which to write project specifications. It is intended as a map or outline from which site and project-specific specifications can be developed. The components of these guidelines, if incorporated into revegetation specifications, should provide a complete plan capable of producing a project that can support a sustainable plant community, thereby reducing the risk of erosion as much as possible.

- **Objective One: Plan Preparation Should Include a Qualified Restoration Specialist[i] or Team**

  - Guideline 1A: Plans and specifications for a revegetation project should be developed by a revegetation specialist (or team of specialists) that is (are) capable of producing a complete revegetation and erosion control package that reflects the Objectives and Guidelines presented in this document.

  - Guideline 1B: Initial Planning Approach: The revegetation specialist or revegetation team should be included in the planning process from plan inception. Revegetation planners should work closely with the project engineers through the entire planning process in order to assure that the engineering and biological components of the projects are completely integrated. These guidelines suggest that in some instances, the engineering components of the project will support the vegetative component and therefore, the vegetation specialist would be part of the primary design team.

  - Guideline 1C: The revegetation specialist or primary member of the revegetation team should function as the revegetation inspector during project implementation.[ii]

- **Objective Two: The initial and potential project outcome should be clearly defined**

  - Guideline 2A: The outcome of the project should be envisioned and defined for at least two points in time:

    - at project completion

    - at some future time, ideally 3 to 5 years following project completion

  - Guideline 2B: When defining the project outcome, components such as physical appearance and physical and biological functioning should be carefully considered.

- **Objective Three: Site specificity is a critical planning consideration.**

  - Guideline 3: Each project must be considered as an individual and unique situation in both time and space. As the revegetation/erosion control plan is being developed, these unique aspects should be taken into consideration and dealt with accordingly. Although many of the individual components are covered in subsequent sections of these guidelines, these specific components would include at least:

    - Topography and related physical parameters
    - Geology, subsurface materials and parent material type
    - Soil parameters
      - *Nutrient and organic matter content*
      - *Texture, structure, water holding capacity and infiltration capacity*
      - *Compaction*
      - *Toxicity or contaminants*
    - Existing plant community and surrounding plant community
    - Actual and potential uses of the site and surrounding areas.

- **Objective Four: Topographical and geological features should be considered for each project.**

  - Guideline 4: Physical features must be considered and where appropriate, they must be ameliorated and /or planned for. These features include:

    - Existence of native topsoil[iii]

    - Slope angle or steepness

- ♦ Consolidation or stability of existing soil surface
- ♦ Outcropping of parent material or other rock surfaces
- ♦ Drainage patterns on site
- ♦ Drainage from off-site sources onto the project site
- ♦ Elevation
- ♦ Aspect

- These topics are discussed in greater detail in the endnotes.[iv]

- **Objective Five: Determine the soil properties**[v]

  - Guideline 5A: Pre-project soil sampling: Soil samples must be taken from the project site and from an adjoining native or well-vegetated reference site where possible in order to establish nutrient needs and nutrient status.

    - ♦ 5A-1: Soil samples must be taken by a qualified and trained individual using an approved method.[vi]

    - ♦ 5a-2: Soil samples must be analyzed by a soils laboratory using appropriate methods.[vii]

  - Guideline 5B: Soil amendment recommendations[viii] should be made based upon the soil samples and past research that has suggested appropriate levels of soil amendments required for successful revegetation. These recommendations must be made by a qualified individual. Further information can be obtained from the Nevada Tahoe Bond Act TAC or the Tahoe NRCS office (530) 541-1496.

  - Guideline 5C: Soil Preparation: Soil must be prepared so that the soil profile is free from compaction to approximately 12 inches wherever possible. [ix]

  - Guideline 5D: Application of soil amendments: soil amendments should be applied evenly over the soil surface and then incorporated into the top 0.5 to 2 inch layer, unless otherwise specified by the supplier. This can also be done by mechanical rake or hand methods (usually a hand rake).

  - Guideline 5E: Finished Ground Surface Shape: the finish surface should be left in an irregular shape. [x]

  - Guideline 5F: Minimize future disturbance wherever possible. [xi]

- 5F-1: Brush, logs, rocks and other natural materials can be placed strategically across the project to make traffic difficult or impossible. These materials can also add aesthetic appeal if place appropriately.

- 5F-2: In areas that have had high levels of recreational traffic, such as hikers, joggers or mountain bikers, a well defined trail can be created that will concentrate traffic. In that concentrated traffic area, appropriate BMPs can be implemented that can reduce erosion.

- **Objective Six: Use native plant materials whenever possible**[xii]

  - Guideline 6A: Native plant material should be used whenever possible. The plant list should be designed so that the *target* plant community reflects an appropriate local native plant community. The planted material should contain a mix of early colonizers, intermediate seral species and target 'climax' community members.[xiii]

  - Guideline 6B: Seed or cuttings should be taken at the appropriate time and should be collected from as close to the project site as possible.[xiv] Plant material that is to be used for seedlings/live plants may need to be collected well in advance of project construction, sometimes *as much as a year in advance*.

    - 6B-1: Non-local, commercially available native grass species may be appropriate as a foundation for the seed mix.[xv]

  - Guideline 6C: Seed or plant material collection should be supervised by a person knowledgeable about local native plant material collection.

  - Guideline 6D: A combination of seedlings and direct seeding should be used to provide the best combination of protection.[xvi]

  - Guideline 6E: Seedlings should be planted using an appropriate technique and a high-quality slow-release nutrient source.[xvii]

  - Guideline 6F: Plants should be planted at the appropriate time of year. The planting time should be specified in the planting plan. A contingency should be provided if the target planting window is not achieved.[xviii]

  - Guideline 6G: Environmental, ecological and physiological requirements of seed should be considered when preparing a seed planting specification. Typically, seeds may be raked into the soil surface to a depth of no more that 0.5 inches in order to keep seed material from moving off site. Planting specialists should be contacted for further information (see Comstock Seed and Western Botanical in 'Appendix One').

- **Objective Seven: A long lasting mulch material should be used.**

  - Guideline 7A: A native mulch such as pine needles or fir needles is preferred. [xix]

  - Guideline 7B: Certified weed free or native straw should be used for short-term stabilization only.[xx]

  - Guideline 7C: Wood chips may be used for temporary erosion control.[xxi]

  - Guideline 7D: Mulch material should be of a thickness that can both protect the soil surface and allow plant growth. The specific thickness of mulch cover will depend upon the type and consistency as well as the density of the mulch material. However, as a rule, most of the ground surface (>95%) should be covered. [xxii]

    - 7D-1: Pneumatic (mechanical blower) application is preferred over hand application of most mulch materials since pneumatic equipment allows better mulch-to-ground surface contact, thus providing superior erosion protection. However, hand application may be a practicable alternative in hard-to reach or very small areas.

  - Guideline 7E: Geotextile materials can be used as a covering over a native mulch material, but *should not be used as the primary mulch cover.*

    - 7E-1: Geotextiles should consist of biodegradable materials and should include no plastics or other so-called 'photo-degradable' materials.[xxiii]

    - 7E-2: Stapling of fabric should follow or exceed manufacturer suggestions. Care should be taken to allow complete contact between the fabric matrix and the soil surface. This is especially important on rocky surfaces.

  - Guideline 7F: An organic tackifier may be used on steeper slopes or in windy conditions or other situations where additional mulch stabilization is required.

- **Objective Eight: Maintenance Considerations**[xxiv]

  - Guideline 8A: Projects should be designed so that irrigation is not needed. However, if long-term drought threatens plant survival during the first two growing seasons, irrigation may be considered. However, irrigation should only be used to assist in plant establishment. [xxv]

- Guideline 8B: Plant replacement contingency should be included in case a significant portion of the planted seedlings die or are very unhealthy. [xxvi]

- **Objective Nine: Project monitoring should provide the project proponent with useful information.**

  - Guideline 8A: Short term monitoring should be designed to ascertain immediate conditions, short term survival and growth needs of the vegetation community. Soil movement should also be monitored. This information should feed back to the maintenance component.

  - Guideline 8B: Long-term monitoring should be anticipated.[xxvii]

Appendix One: Sources for Material and Information

The following list in no way implies preference or recommendation. However, all of the companies on this list have performed satisfactory work in the particular category in which they are listed. This list does not include all possible sources. Any persons or companies wishing to be included on future lists can contact the NRCS Office or Michael Hogan at IERS. For general questions also please contact the NRCS (530) 541-1496 or Michael Hogan (530) 525-1335.

Soil Testing:

- For information, contact NRCS Office.....(530) 541-1496
- Laboratory Analysis: Soil and Plant Lab; Laurie Littleford.....(408) 727-0330

Native plants

Collection:

- Comstock Seed Co.....(775) 746-3681

Nurseries:

- Cornflower Farms.....(916) 689-1015
- NDF Washoe Nursery.....(775) 849-0213

General/Info/Specs, etc.:

- Western Botanicals.....(775) 849-3223
- HLA; Jeanette Halderman .....(530) 550-9260
- California Native Plant Society, Tahoe Chapter.....(530) 525-4366

Seed

- Comstock Seed Co.....(775) 746-3681
- Pacific Coast Seed.....(925) 373-4417
- Conservaseed.....(916) 775-1646
- Hedgerow Farms.....(530) 662-4570

Compost

- Full Circle Compost.....(775) 782-5305
- Bentley Agrodynamics.....(775) 782-9309

Pine Needle Mulch

- South Shore: South Tahoe Refuse - Jeannie Lear.....(530) 541-0366
- Incline: Waste Not - Jessica Bayer.....(775) 831-8603
- Tahoe North/Truckee: ERL - Vince Nocito.....(530) 587-4235

▪ Appendix Two: Endnotes

[i] "Qualified" in this context in intended to mean: capable of producing a viable revegetation plan based upon these guidelines. A well-prepared plan that reflects the values and practices presented here will indicate to the plan review committee whether the individual or individuals are qualified.

[ii] The revegetation specialist will have the clearest idea of what the project should look like on the ground. Many projects are incorrectly implemented due to a simple misunderstanding between the project planners and the implementing personnel. If the revegetation specialist were utilized as a member of the inspection team, much of this potential misunderstanding would be circumvented.

[iii] If a native or developed topsoil material is present on site, accommodations should be made to remove, stockpile and re-apply this material to the final project. Reapplied topsoil is generally not sufficient to replace total nutrient needs for an entire project and so an additional nutrient source should also be considered, based upon the results of the soil tests.

[iv] The various subjects outlined in Guideline 4 include:

- Slope angle or steepness

The angle of the slope is generally a primary determiner of erosion potential. Often, oversteepened slopes require some sort of reworking to lower the angle.

- Consolidation or stability of existing soil surface

If the surface material is unconsolidated or otherwise unstable, greater erosion potential exists. If this is the case, a greater amount of effort may be required to stabilize the soil material.

- Outcropping of parent material or other rock surfaces

If parent material is close to the surface or is exposed, adequate rooting depth may not exist. This situation needs to be recognized and planned for.

- Drainage patterns on site

Surface and subsurface drainage patterns should be recognized and accounted for in the overall surface preparation plan.

- Drainage from off-site sources onto the project site

Drainage from off site sources can severely effect the soil stability of the project, causing rills, gullies, etc. This is an oft-overlooked component of project planning.

- Elevation

Different elevations are associated with different soil temperatures, precipitation levels and plant communities.

- Aspect

Aspect can have a great influence on solar input and therefore, evapotranspiration potential. This can have a large influence on the type of plants that will survive there.

[v] The soil is potentially the most important component of a revegetation project and process. If a soil does not contain adequate nutrients or if it is over-compacted or affected in some other way, plants will not be able to establish or maintain a foothold and will therefore not persist. Care must be taken to understand and ameliorate all sub-standard soil parameters.

[vi] Soil research conducted in the Lake Tahoe Basin has shown a correlation between certain nitrogen pools and successful revegetation efforts. Soils should be analyzed using the methodology outlined in this report so that the extensive data that has already been gathered can be used to define soil amendments that will be required on a specific project. This research is reported in Caltrans Report RTA53X461. This report should be available from John Haynes (916) 227-7109, The Tahoe NRCS Office (530) 541-1496 or the UC Davis Soils and Revegetation Group (530) 752-6514. The research and methodology have been developed by the UC Davis Soils and Revegetation Group. The research has been conducted and reported by Claassen and Hogan. As other research is conducted and evaluated, that research will be included as an additional evaluation method.

[vii] Soil samples can be analyzed by a qualified soil lab using specific testing methodology. This methodology is that which was used by Claassen and Hogan (Caltrans Report RTA53X461) in collecting data referenced previously. Using this methodology, meaningful analysis can be accomplished. The analysis protocol has been developed for wildland soils analysis and is additional to any agronomic tests that may be required. These tests will be available from Plant and Soil Laboratories, Laurie Littleford, (408) 727-0330. Other labs may be able to perform these tests. Inquiries should be made to the Nevada Tahoe Bond Act TAC or the Tahoe NRCS office (530) 541-1496.

[viii] Soil amendments should mimic the nutrient content and release characteristics of a native soil. Amendments will typically consist of stable compost and an appropriate slow release amendment or some other equivalent material that fulfills the requirements indicated in the soil tests.

[ix] Compaction can be ameliorated by mechanical means such as a tractor-operated sub-soil cultivator, a disc or other suitable method, or by hand, using a pick-mattock, pulaski or other hand tool. Soil does not need to be finely dispersed but must be in such a state that water can freely penetrate to a depth of at least 12 inches. Reducing compaction will reduce erosion by allowing infiltration into the soil profile. Additionally, compacted soils are less able to support a plant community due to the decrease in water holding capacity as well as the physical barrier to root penetration.

[x] Small surface irregularities can create pockets to trap or slow runoff. These irregularities can be created by a skillful equipment operator if careful explanation is provided. Irregularities can also be created by hand tools or even by carefully planned foot traffic. In some cases (probably not appropriate to the

Lake Tahoe Basin) cattle and sheep have been used to create micro-depressions and material incorporation. The overall idea is to reduce any continuous smooth surface so that surface flow velocity will be reduced.

[xi] Future potential traffic patterns across the project area.should be identified and controlled. This includes intentional and random traffic by humans as well as animals. Canines, children at play and other pedestrians can have a large negative impact on the project area. Projects that have attempted to revegetate old roads or trails have been completely destroyed by continued, uncontrolled use after project completion.

[xii] Native plants offer several advantages over non-native materials. Native plants are well adapted to the local area, many native plants can often survive and possibly thrive with less water and nutrients than non-natives, and the use of natives, if collected locally, will not introduce weed seeds.

[xiii] The Tahoe Regional Planning Agency has developed an "Approved Plant List". The suggestions in these guidelines are more restrictive since we believe that native plants are preferable to non-native adapted species. However, much discussion is currently underway concerning plant material in general. If native plant material is not available, available, non-native material from the TRPA Approved Plant List may be used. Sources of native plants and native plant nurseries may be obtained from the Lake Tahoe Basin NRCS office at (530) 541-1496.

[xiv] Seed or cuttings should be taken from a range of plants and populations wherever possible in order to insure genetic diversity. As a general rule, material should be collected within 1500 ft in elevation and 50 linear miles distance from the project site. Plant material should not be collected from a different plant community type than the target community.

[xv] Species such as Elymus glaucus Stanislaus 5000 or Mokelumne Brome may be acceptable as a partial component of the seed mix but unless the project is an emergency stabilization project, these non-local materials should make up only a portion of the entire seed mix, not to exceed 25% except in unusual circumstances.

[xvi] Seedlings will provide initial and immediate soil protection and will provide a long-term seed bank/plant community source. Direct seeding provides a seed bank for longer-term plant establishment. The mix should consist of a combination of grass seed for quick, initial stabilization and forb and shrub seed for longer-term plant community establishment. It should be kept in mind that the use of native seed often requires a longer-term commitment to germination and growth of seeded material. Some species may not germinate for several years. This reality underscores the need for a stable, long-lasting mulch material.

[xvii] Some of that nutrient source should be placed in the bottom of the planting hole and separated from the root mass by a thin layer of soil. Some additional nutrient should be placed on the surface in a circular pattern outside the plants drip line. Specific amounts and placement will depend upon the size of the

seedling or plant. Planting holes should be flooded and allowed to drain down at least twice unless soil moisture is adequate to support the seedlings.

[xviii] There are varying professional opinions regarding the best time of year to plant. Generally, Fall is believed to be the ideal time to plant if natural rainfall follows in a reasonable time after planting. Spring plantings have also been successful. Mid-summer planting can be used if supplemental irrigation is provided for seedlings. The concept that must be considered is: If the soil surrounding young seedlings is allowed to dry down in the root zone, weakening and mortality is likely to occur. This concept should be provided for in any planting plan.

[xix] Native mulches, when used in the proper amount, can provide long term stabilization, decrease evaporation and ameliorate soil surface temperatures. Additionally, native mulches may contain local micro-flora and fauna as well as nutrients, especially if duff material is included. It is important to consider the source of materials, especially pine needles, when designing and planning for a project. Pine needles are typically available during the spring and early summer from a variety of sources. However, materials may need to be reserved or arranged for well in advance of a Fall project.

[xx] Straw may be associated with importation of non-local flora as well as noxious weed seeds. If straw is to be used, a locally collected native grass straw is preferred. If that is not available, a commercially available native grass straw may be used, if available (Conservaseed- (916) 775-1646). The useful life of straw mulch is 1-3 years, depending upon soil and other environmental conditions. Native plants tend to be slow to germinate and generally are slower growing than aggressive non-natives are. Given this reality, a long lasting mulch cover is a necessity.

[xxi] Wood chips have been shown to provide an effective mulch cover for erosion control. However, their effectiveness for plant regeneration has not yet been well established. Further work is being conducted by the Caltrans Erosion Control Lab. Wood chips are not, therefore, acceptable as the sole mulch material on revegetation projects at this time.

[xxii] The specific thickness of mulch cover will depend upon the type and consistency as well as the density of the mulch material. However, as a rule, most of the ground surface (>95%) should be covered. Thickness for pine needle mulch will range from 0.5 inches to 1.5 inches, depending on site parameters, the type of material used and application method.

[xxiii] Plastic materials present wildlife and aesthetic concerns. Materials such as coconut fabric (coir), jute and hemp are appropriate materials for restoration-based erosion control projects.

[xxiv] Maintenance can be a crucial component of the overall project. If a project is carefully planned and executed, maintenance should be minimized. However, if maintenance is required, it could determine the difference between successful establishment and marginal establishment.

[xxv] Irrigation can be used to assist plant community establishment but should be carefully planned and applied.

- Irrigation should be appropriate for the plant community and plant type. Design should be done by a qualified irrigation system designer and should be installed by trained personnel.
- Irrigation should be low-flow so that input rate does not drastically exceed infiltration rate. This type of design allows water to permeate to the root zone and beyond, which encourages a deeper root system and minimizes run-off.
- Irrigation should only be used to supplement natural precipitation during dry periods and then only as an aid to establishment. Permanent irrigation should only be used for landscape projects and never on revegetation or restoration projects. Excess irrigation will act to encourage non-native and/or wet-site plants that will die off after irrigation is removed.

[xxvi] This component must be written into the initial proposal and translated to the contract, especially if a maintenance component is to be included. Specific ratios should be determined by the revegetation specialist.

[xxvii] Currently, the Nevada Tahoe Bond Act TAC does not require ongoing monitoring. However, a minimum of as-built documentation and photo-point monitoring should be included as part of the project. This monitoring plan should include photo-point locations, the time of the year that the photos will be taken and the name of the person responsible for monitoring. Photos should be taken before the project begins, immediately after the project and once a year for three years. Post project photos should be taken at the same time each year, preferably in the early fall.

11 Nov, '09

ATTACHMENT D

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

Please note that updates have been made to the Application for 2009. Please read carefully.

GRANT APPLICATION PACKET

Checklist — Page

GRANT APPLICATION FORM

A. Project Title:
Warrior Way Erosion Management & Water Quality Project
(Please refer to project name as listed in EIP)

B. Environmental Improvement Program (EIP Project) #:
Unknown

C. Project Location (Please provide map):
The project is located in Douglas County, Nevada on the following assessor's parcel numbers: 1318-03-000-005; 1318-10-000-003; 1318-10-000-004;

D. Project Description:
Attached as requested.

E. Applicant's Name and Contact Information
Douglas County
Attention: Mahmood Azad, PE County Engineer
Douglas County Community Development
1594 Esmeralda Avenue
P.O. Box 218
Minden, Nevada 89423
Phone: (775) 782-9063 Fax: (775) 782-9007 Email: MAzad@co.douglas.nv.us

E. Estimated Total Project Cost:
Two Million Dollars ($2,000,000)

Grant Amount Requested (not to exceed 75% of total cost of design & construction).
One Million Dollars ($1,000,000)

Sources and amounts of matching funds:
This project is seeking participation from the United States Forest Service in the amount of One Million Dollars ($1,000,000) through their Erosion Control Grants program concurrently with this grant application.

F. Owner of Property:
1318-03-000-005 is owned by Douglas County (School District)
1318-10-000-003 is owned by Douglas County
1318-10-000-004 is owned by United States Forest Service

If others hold any outstanding property rights (additional owners, public/private easements, etc.), attach explanation of how they will participate.
The property rights are retained by public entities. One being the United States Forest Service and the other being Douglas County. The Douglas County School District (while a branch of Douglas County) maintains 1318-03-000-005 as

Zephyr Cove Elementary School. The school district is willing to work cooperatively with the applicant as evidenced by the attached letter of support. The US Forest Service is the other owner. We are requesting the US Forest Service participate with grant funding as well as providing land upon which portions of the proposed improvements will be located.

G. On behalf of Douglas County, I request this Application be considered for financial assistance with the Nevada Division of State Lands, Water Quality and Erosion Control Grants Program.

Mahmood Azad, PE County Engineer
(typed name)

Signature Title Date

PROJECT DESCRIPTION REQUIREMENTS

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

1. **Project Schedule** - Provide the estimated design and construction schedule for the project.

2. **Project Participants** - List all key project participants (individuals and organizations) and their project roles. For example project proponent, consultants, funding partners and key landowners.

3. **Project Summary** - Provide a **detailed** description of the project including extent of contributing drainage area, and all known existing problem areas. Photographs (or color copies) of the project area showing the problem areas should be included where possible. (See guidelines for more information). In particular, the description should provide details of how problem areas are contributing pollutants to the lake with specifics on connectivity within the project area and with surface water bodies. To the extent feasible, the project description should also identify pollutant controls, practices and/or policies that are expected to be implemented for this project to meet future anticipated load allocations from the Nevada Division of Environmental Protection (NDEP) in terms of fine sediment and nutrient reduction. Lastly, please provide a detailed discussion as to why this project is a priority for implementation in terms of Lake clarity or to further the attainment of TRPA Environmental Thresholds (e.g. SEZ restoration, etc.)

4. **Conceptual Project Goals, Objectives and Anticipated Results** - Describe the conceptual Goals and Objectives of the proposed project and the anticipated results. Please refer to the program goals and objectives in section six.

5. **Operations and Maintenance** - The applicant must commit to providing project operation and maintenance for a minimum of 20 years after completion of project construction. An operations and maintenance plan shall be developed in conjunction with the selected design alternative.

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 with the understanding that Grant payments are on a reimbursement basis only.

D. The Applicant will have sufficient funds available when construction is completed to assure effective operation and maintenance of the facility 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 and the Nevada Tahoe Conservation District (the "DISTRICT") 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 it's 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 Mahmood Azad, PE County Engineer

Signature _____ Date: _____

SAMPLE RESOLUTION

Resolution of the ***Douglas County Board of County Commissioners*** approving the application for State of Nevada Lake Tahoe Water Quality and Stream Environment Zone Grant Funds.

Project: Warrior Way Erosion Management & Water Quality Project

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

WHEREAS, the Nevada Tahoe Conservation District has been assigned to assist the administration of the program and development of procedures governing the program; 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 ***Warrior Way Erosion Management & Water Quality*** project is approved for implementation;

BE IT FURTHER RESOLVED that the ***Douglas County Board of County Commissioners*** does hereby certify that said agency can finance 100% of their share of the project.

BE IT FURTHER RESOLVED that the ***Douglas County Board of County Commissioners*** does hereby appoint ***Mahmood Azad, PE County Engineer as*** agent of the ***Douglas County Board of County Commissioners*** 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, .

_____ _____

Name Title

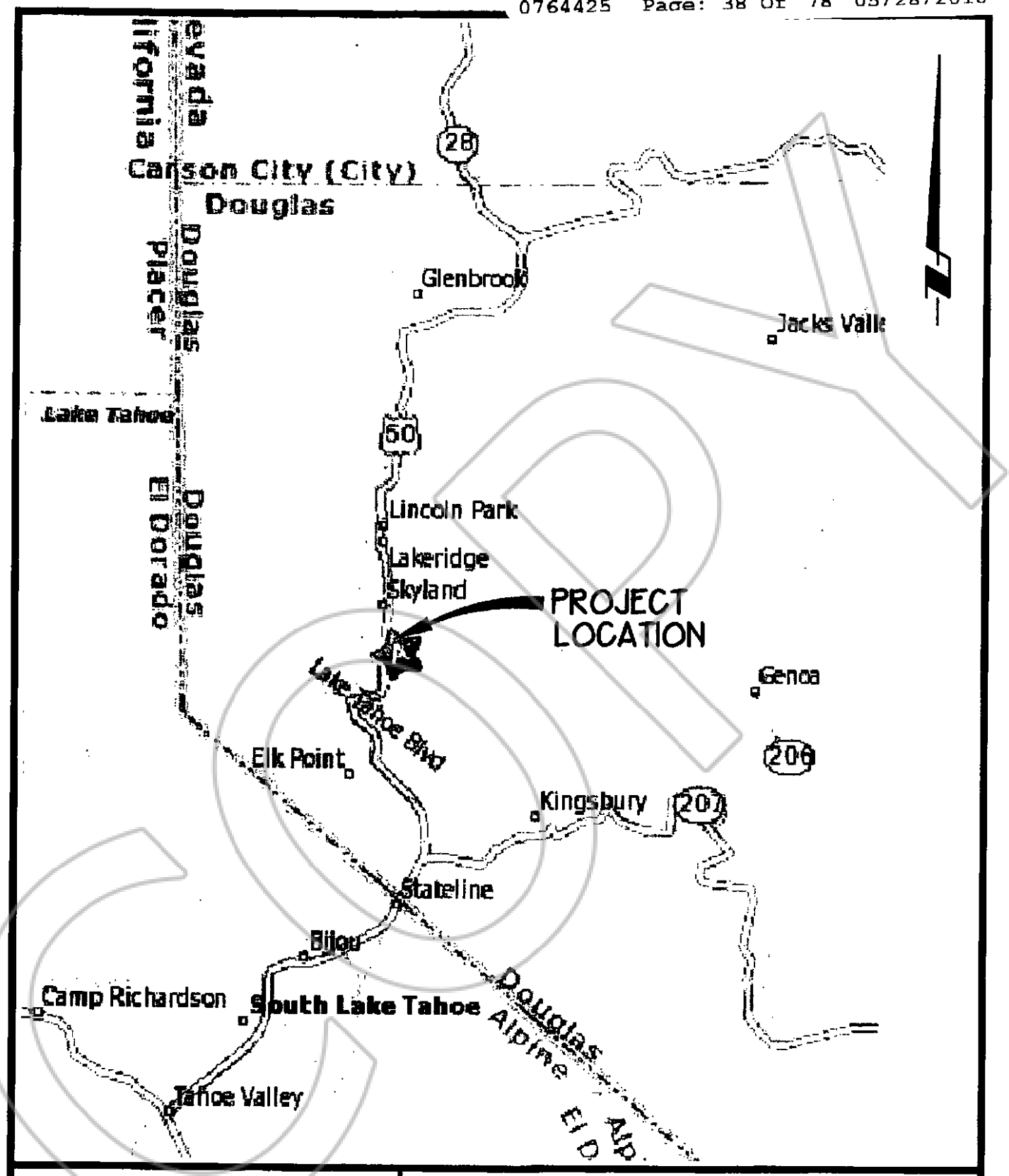
Attest:

_____

Name

_____

Title



R.O.Anderson

1603 ESMERALDA AVENUE / POST OFFICE BOX 2229
MINDEN, NEVADA 89423
PHONE: (775) 782-2322 / FAX: (775) 782-7084
WEB SITE: WWW.ROANDERSON.COM

EXHIBIT 1
AREA MAP

10/28/09

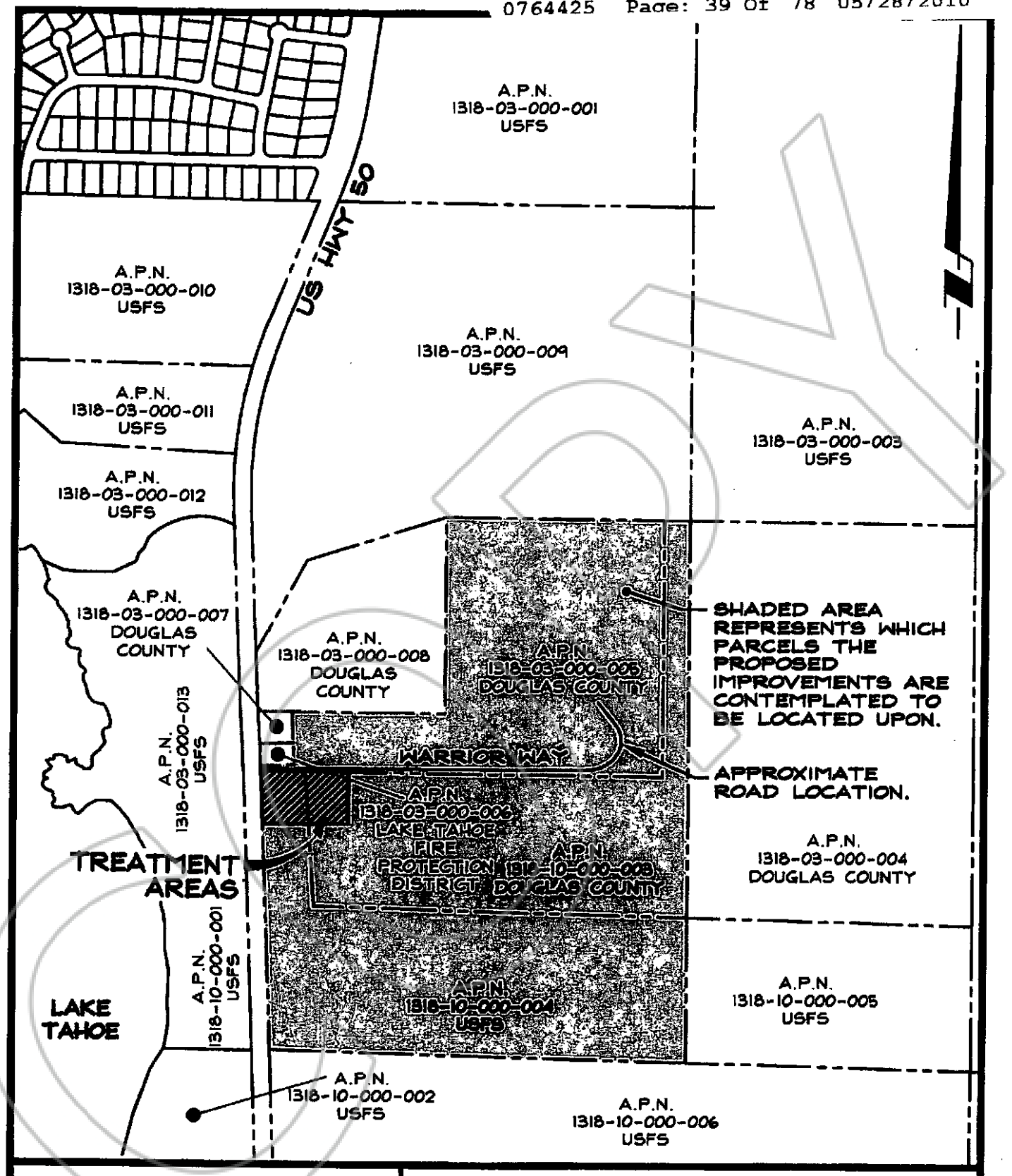


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EXHIBIT 2
VICINITY MAP

11/02/09

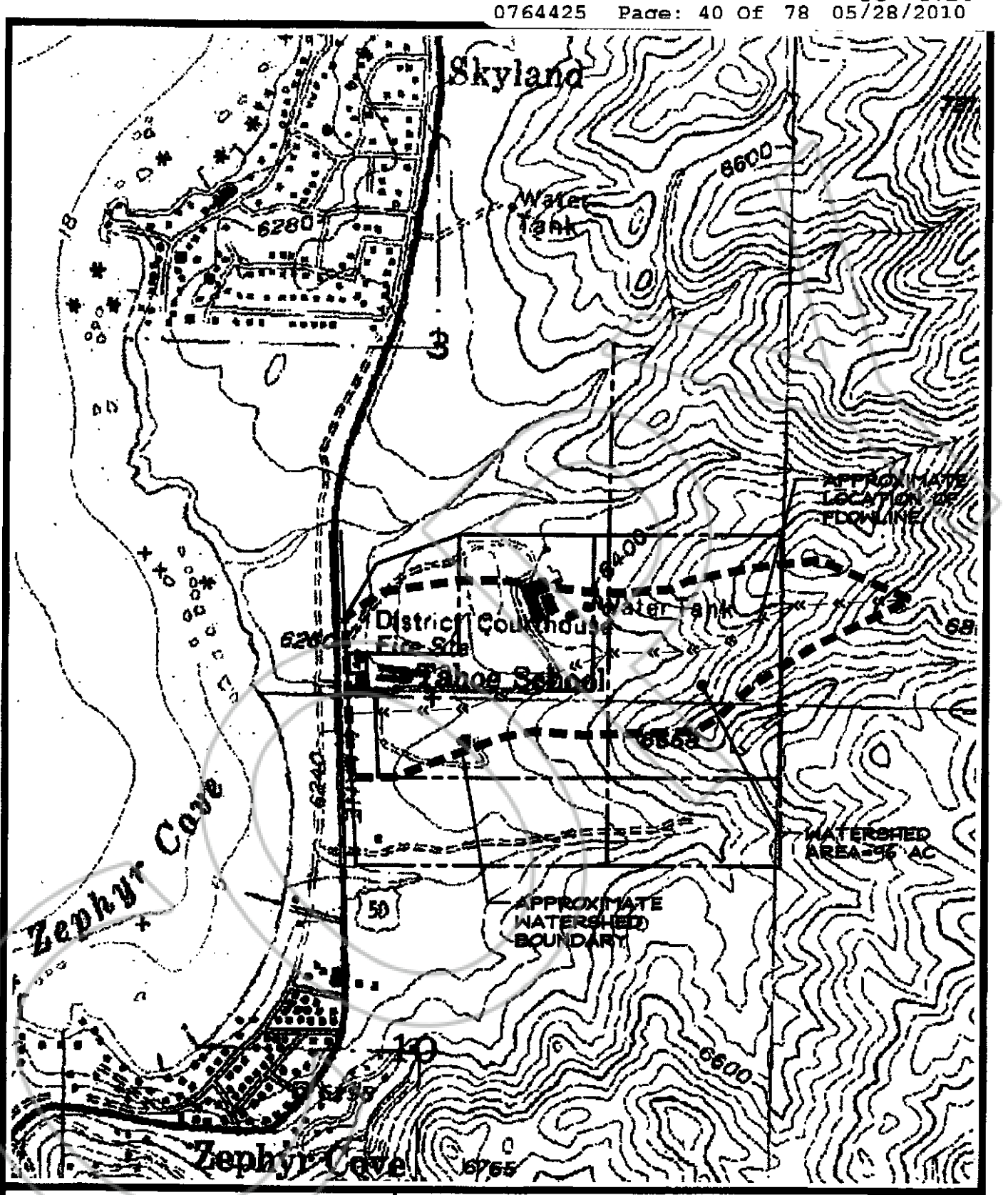

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EXHIBIT 3
CONTRIBUTING DRAINAGE AREA

11/02/09

Soil Map—Tahoe Basin Area, California and Nevada
(EXHIBIT 4)

USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

10/29/2009
Page 1 of 3

EXHIBIT 4

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:4,810 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 11N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tahoe Basin Area, California and Nevada
Survey Area Data: Version 8, Feb 14, 2008

Date(s) aerial images were photographed: 7/2/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

EXHIBIT 4.1

Map Unit Legend

Tahoe Basin Area, California and Nevada (CA693)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7411	Cagwin-Rock outcrop complex, 5 to 15 percent slopes, extremely stony	57.4	71.2%
7412	Cagwin-Rock outcrop complex, 15 to 30 percent slopes, extremely stony	4.1	5.1%
7413	Cagwin Rock outcrop complex, 30 to 50 percent slopes, extremely stony	0.3	0.4%
7421	Cassenai gravelly loamy coarse sand, 5 to 15 percent slopes, very stony	1.1	1.4%
7422	Cassenai gravelly loamy coarse sand, 15 to 30 percent slopes, very stony	5.0	6.2%
7444	Christopher-Gefo complex, 0 to 5 percent slopes	0.2	0.2%
7461	Jabu coarse sandy loam, 0 to 9 percent slopes	11.4	14.1%
9011	Oxyaquic Cryorthents-Aquic Xerorthents-Tahoe complex, 0 to 15 percent slopes	1.2	1.5%
Totals for Area of Interest		**80.6**	**100.0%**

EXHIBIT 4.2

D. Project Description

This project can be simply described as an erosion control and water quality improvement project for the urban storm water run-off on Warrior Way. It involves the cooperation of several different entities such as Douglas County, United States Forest Service, Douglas County School District and potentially the Nevada Department of Transportation.

Currently, only a portion of the storm water run-off from Warrior Way is being treated. This treatment mainly occurs at the Zephyr Cove Elementary with some limited treatment in an existing infiltration gallery adjacent to the westerly drive access to the baseball field. This project plans to use a combination of erosion control, conveyance improvements, a water quality treatment train and maintenance to achieve the overall goal of improving the storm water run-off quality discharging to Lake Tahoe.

Existing slope and road side shoulders will be stabilize through a combination of vegetation, vehicular restriction and signage to reduce the amount of erosion occurring along the road shoulders and adjacent cut bank slopes.

Improvements to the storm water conveyance system will be made such as new roadside ditches, curbs, catch basins and storm drain culverts which will improve the efficiency and capacity of the existing conveyance system.

At this time, the plan is to install water quality treatment trains in two different locations. One train will be installed on Douglas County property and another train will be installed on United States Forest Service Property. Each of the treatment trains will consist of mechanical storm water separation (with high flow by-pass capability), a primary coarse sedimentation basin, a surface flow wetland area, sub-surface wetland treatment area, a shallow vegetated conveyance swale and a retention infiltration gallery.

Because of access to the schools this road receives significant road abrasives in the winter months. These abrasives are ground to a fine-grained sediment via vehicle tires. Although limited hydraulic connectivity to the Lake is available, there is a chance that during high-flow events fine-grained sediments stored in the forested area will be transported to the Lake. Thus we are proposing a very advanced treatment train to capture the high volume fine-grained sediment and remove it from the potential for transport to the Lake. Nutrients like phosphorus, nitrogen and iron will also be sequestered and removed. Douglas County Engineer, Mahmood Azad, PE has successfully designed and implemented this treatment train to treat stormwater successfully. The proposed treatment train will successfully remove nutrients, fine-grained particles, oils and grease. It should be noted that prior to developing alternatives we intend to run the PLRM model to determine the hydraulic continuity of this catchment to the Lake.

A maintenance plan will be designed, implemented and followed to insure the system achieves the full extent of its design life. The plan includes provisions for the installation of monitoring wells so the effectiveness of the proposed treatments can be documented over time as part of the maintenance plan. Douglas County is in the process of developing a Lake Tahoe Stormwater Master Plan (LTSWMP). A part of this plan is to develop sustainable revenue stream to fund maintenance in support of the fine-grained sediment TMDL.

1. Project Schedule

May 2010	Contractual and Inter-local for grant
May 2010	Data Collection for PLRM-catchment analysis
June 2010	Confirm hydraulic continuity of catchment
June 2010	Go-No Go due to hydraulic continuity determination
June 2010	Determine NEPA requirements in consultation with USFS
June 2010	Initiate TAC-Stakeholder Process
July 2010	Develop Alternatives
October 2010	Select preferred alternative with TAC-Stakeholders
November 2010	Initiate detailed design of preferred alternative
May 2011	Complete 90%+ Design
June 2011	Complete NEPA documents (if necessary)
December 2011	Complete NEPA decision as necessary
January 2012	Complete plans, specs and bid documents
January 2012	Begin TRPA Permitting
February 2012	Bid and award
May 2012	Start Construction
September 2012	Complete earth moving Construction
October 2012	Wetland planting and revegetation
October 2012	Construction complete
October 2012	Initiate plant and vegetate monitoring
October 2012	Initiate water quality and Beta monitoring for TMDL
July 2013	Re-vegetate and plant as necessary

2. Project Participants

Douglas County: As the project proponent Douglas County will take the lead role in this project and they also are a key land owner. They will be making applications for funding through grants, spearheading requisite permitting applications, hiring consultants for the design and oversight of construction, coordinating between the various project participants. Additional they will be providing land upon which a portion of the water quality improvements will be constructed upon. The County will also be responsible for maintaining the improvements once they are in place. Mahmood Azad, as County Engineer will be the County's main point of contact.

United States Forest Service: The Forest Service will be a funding partner as well as a key landowner. A portion of the water quality improvements are proposing to be constructed upon Forest Service property. Genevieve Villemaire is the Erosion Control grants Manager for the USDA Forest Service and will be the main point of contact.

Douglas County School District: The school district is a branch of the County but separate from the Community Development. The district has limited funds available to contribute but they do have infrastructure in place along Warrior Way that is providing some level of water quality treatment. They have been informed of the goals and objectives of this project and are agreeable to cooperate and participate as much as their limited budgets will allow. They may also participate through cooperation of sharing infrastructure and granting easements as may be necessary. Holly Luna is the Director of Business Services and will be the main point of contact.

R.O. Anderson Engineering: The firm will be the design engineer for the project responsible for design, permitting and construction administration of the proposed improvements. Some assistance with grant applications will also be provided by this firm. Jeremy J. Hutchings, PE as Director of Engineer at R.O. Anderson Engineering will be the main point of contact.

3. Project Summary

Description:

The project is located on Warrior Way in Douglas County, Nevada in Township 13 North, Range 18 East Section 3. The contributing drainage area has been estimated as 96 Acres. However, the project area is limited to the urban drainage along Warrior Way and the adjacent elementary school, park and library buildings which consist of approximately seven acres of impervious area. Warrior Way is approximately 2,080 LF in length and generally drains from the east to US Highway 50 to the west at slopes varying from approximately 2% to 8%. Lake Tahoe is located approximately 550 FT to the west of the Warrior Way and US Hwy 50 intersection.

Although the Douglas County School District has provided treatment it is somewhat limited in that it their system was designed for Zephyr Cove Elementary and not Warrior Way. The majority of the run-off from Warrior Way is not treated and is connected to Lake Tahoe through either direct sheet flow or a combination of sheet flow and shallow conveyances.

Existing Problem Areas:

There are several existing problem areas for this project. Exhibit 4 attached with this application identifies approximately 3,785 LF of shoulder erosion, 300 LF of eroding cut banks and three different parking lots which are contributing to the degradation of the water quality and clarity of Lake Tahoe. Additionally, these areas are all sanded during the winter for obvious vehicular safety reason. This also causes degradation to the quality and clarity of the Lake.

In Figure 1 below you can see vehicles parked along the shoulder of the road which is not paved. This is a typical example of the shoulder erosion problem for this project.

Figure 1 – Standing near the intersection of Warrior Way and US Highway 50 looking easterly along the alignment of Warrior Way.

In Figure 2 below you can see an example of a cut bank with limited vegetation. This bank continues to erode and deposit sediments onto Warrior Way which contributing to the degradation of Lake Tahoe's quality and clarity.

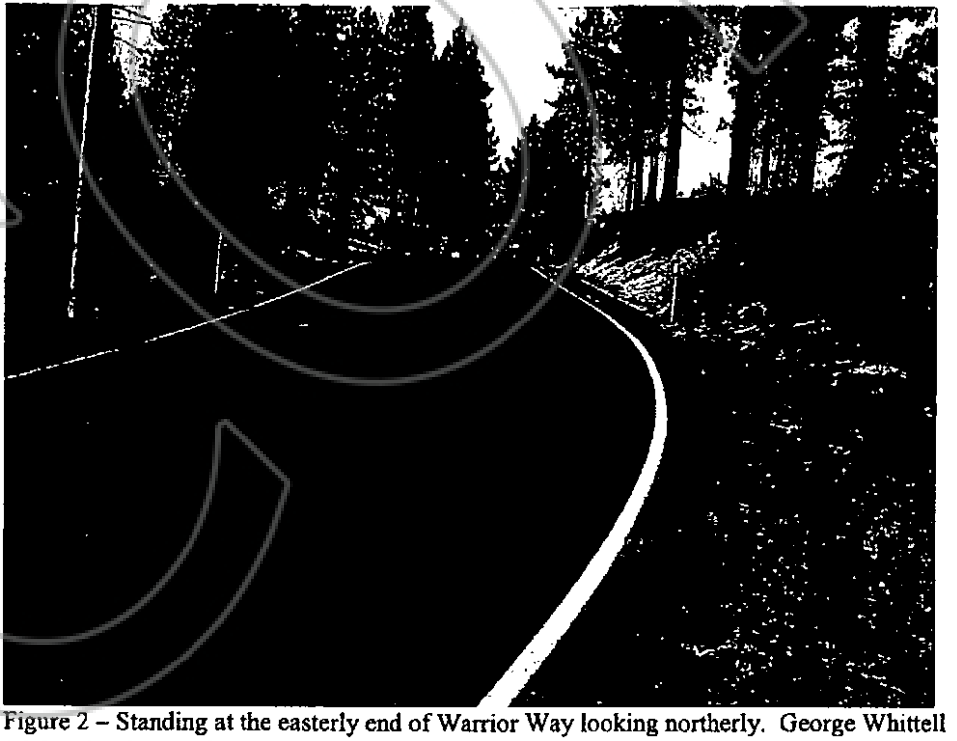

Figure 2 – Standing at the easterly end of Warrior Way looking northerly. George Whittell High School is just beyond the end of the road.

Parking lots, such as the one for the Zephyr Cove Park and Library shown in Figure 3 below are a source of pollutants that also cause degradation to Lake Tahoe's water quality. Combined with an apparent lack of maintenance as shown by the completely plugged drop inlet in Figure 5 means that parking lots such as they are not being treated prior to discharge to Lake Tahoe.

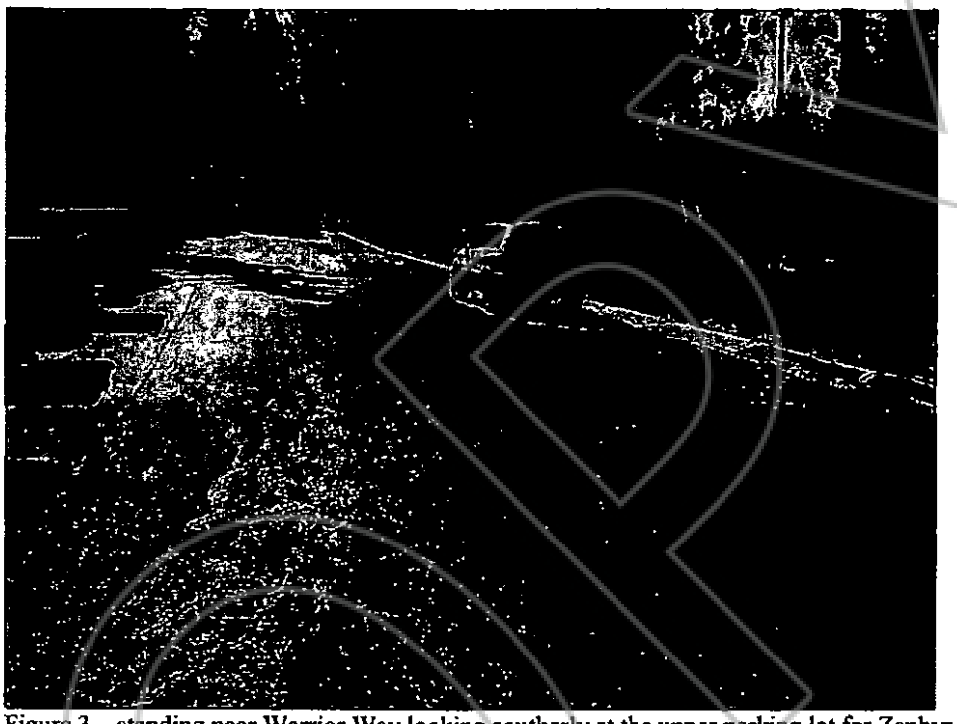

Figure 3 – standing near Warrior Way looking southerly at the upper parking lot for Zephyr Cove Park and Library.

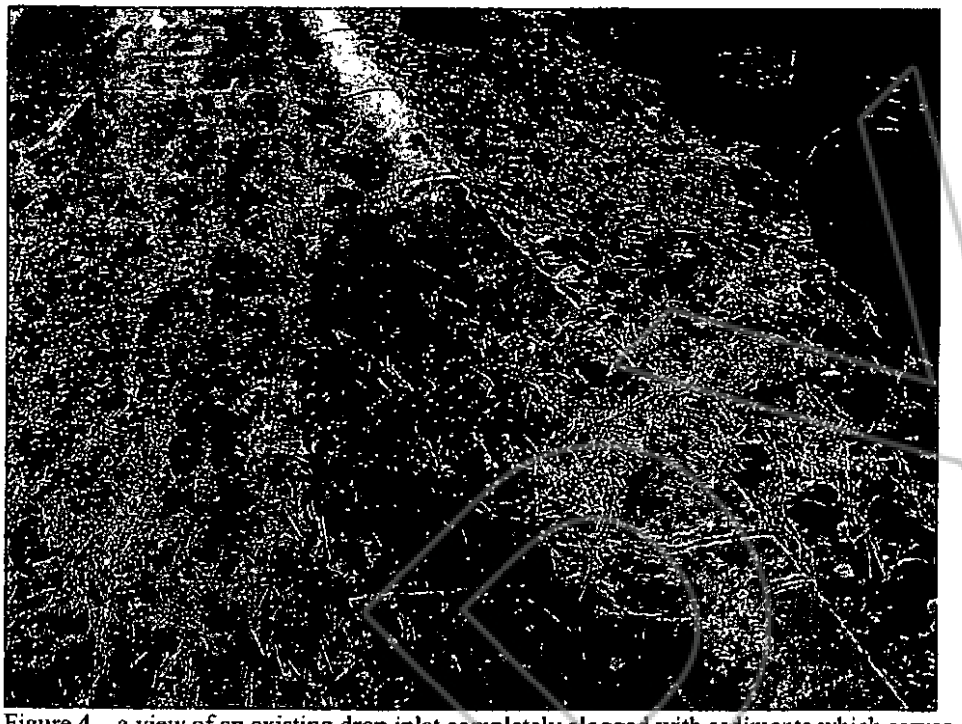

Figure 4 – a view of an existing drop inlet completely clogged with sediments which serves the parking lot shown above in Figure 3.

The problem areas are connected quite directly to Lake Tahoe. Sediments and pollutants sheet flow down Warrior Way where portions can flow directly across US 50 to the Lake or they are channeled to the sides of the road and then flow to existing culverts beneath US 50 and then on to the Lake. As mentioned previously, the shore of Lake Tahoe is located a mere 550 FT from the project area.

Expected Improvements:

This project plans to implement several improvements which are anticipated to meet the future anticipated load allocations from the Nevada Division of Environmental Protection. This project plans to use a combination of source control, conveyance improvements and a water quality treatment train to reduce the sediment and pollutant load to the Lake and thereby achieving the overall goal of improving the Lake's quality and clarity.

Source control will consist of stabilizing existing slope and road side shoulders through a combination of vegetation (with native seed mix), vehicular restrictions and signage to reduce the amount of erosion occurring along the road shoulders and adjacent cut bank slopes. The project includes stabilization of approximately 3,785 LF of shoulder erosion and 300 LF of cut bank erosion.

Improvements to the storm water conveyance system will be made such as new roadside ditches, curbs, catch basins and storm drain culverts which will improve the efficiency and capacity of the existing conveyance system.

Water quality treatment trains are proposed at two locations within the project. Each of the treatment trains will consist of mechanical storm water separation (with high flow by-pass capability), a primary coarse sedimentation basin, a surface flow wetland area, sub-surface wetland treatment area, a shallow vegetated conveyance swale and a retention infiltration gallery. The proposed improvements will treat approximately 6.7 Acres of impervious area including roads, drive aisles and parking lots. An irrigation system will also be installed and used during low precipitation times of the year to insure wetland areas do not die.

Priority Project:

There are several reasons why this project should be a priority for implementation and they include: connectivity to the Lake, lack of adequate existing treatment, high traffic volume to the site.

As described above Warrior Way is located just 550 FT to the west of the intersection of Warrior Way and US Highway 50. This near proximity to the actual Lake makes and the potential for sediments and pollutants to directly discharge to the Lake without treatment makes this a high priority project.

There is existing infrastructure treating portions of the run-off from Warrior Way. However, this infrastructure is located mainly on the school district property and treating mostly the drainage from Zephyr Cove Elementary. There is an existing retention basin that appears undersized and does not serve the entire project area. The existing infrastructure appears to be designed for mitigating run-off volume and coarse sediments but not for pollutant load reduction and fine sediments. Additionally, portions of the infrastructure are not being adequately maintained. This lack of existing treatment infrastructure also contributes to making this project a high priority.

Warrior Way serves as access to Zephyr Cove Elementary, George Whittell High School and Zephyr Cove Park and Library. These are all public uses which generate a significant volume of vehicular traffic. Vehicular traffic is a significant contributor to fine sediment and pollutant loading. This high volume of vehicular traffic is also a contributing factor to making this a high priority project.

4. Conceptual Project Goals, Objectives and Anticipated Results

Conceptual Goals:

The overall goals of this project are to improve the clarity and quality of the urban storm water run-off discharging to Lake Tahoe from Warrior Way. The project intends to exceed the anticipated load allocation requirements from NDEP, reduce the total volume of run-off discharging to the Lake and showcase that it is possible to achieve a high level of water treatment through a cooperative effort between different government agencies such as Douglas County, US Forest Service and Douglas County School District.

Another goal in the design stage of the project is to model the system using the Pollution Load Reduction Model which is just now being made available. The proposed budget makes accommodations for the effort involved with modeling the project with this software.

Anticipated Results:

It is anticipated that we will be able to show that the proposed improvements to the project area will result in a level of water quality and clarity that will exceed the anticipated load reduction requirements. As mentioned previously, the project includes the installation of groundwater monitoring wells so that the effectiveness of the improvements can be tracked over the design life of the project.

Specifically the project plans to reduce the complete erosion rate from an existing rate of approximately 8,215 pounds per year to a post-treatment rate of approximately 1,229 pounds per year. However, this does not account for the application of road abrasives. Accounting for road abrasives the project plans to reduce the sediment load from an existing rate of approximately 34,870 pounds per year to a post treatment rate of approximately 9,509 pounds per year.

5. Operations and Maintenance

The applicant understands the 20 year commitment to operate and maintain the proposed treatment. A full operation and maintenance plan will be developed upon selection of the final design alternative. Provisions such as: access ramps to primary sedimentation and infiltration basins; monitoring wells; and irrigation systems have been included in the proposal indicating the applicant's commitment to providing long term operations and maintenance of the proposed facilities.

5.2 Required Erosion Control Reduction Calculations

Summary:
Overall, it has been estimated that the erosion rate for the project prior to treatment is approximately 8,215 pounds per year and that the estimated erosion rate after treatment has been reduced to approximately 1,229 pounds per year. The following paragraphs show the erosion rates for the various types of erosion on an individual basis.

The sample calculations to support the results below are provided on the following pages.

1.1 Estimated Road Shoulder Erosion:

The road should erosion rate was based on the following preliminary estimates and assumptions:

- -Average shoulder width of 10 FT
- -Length of shoulder of 3,785 FT
- -USLE Conversion Factor of 0.028 (based on Table B-1 from the *State of Nevada Division of State Lands Lake Tahoe – Environmental Improvement Project Water Quality and Erosion Control Grants Program* assuming a percent out slope of 4.)
- -An Erosion Reduction Efficiency of 0.7 (based on the Question 12 Cost Estimator from the previously referenced document for a Reveg Type D shoulder treatment)

The estimated road shoulder erosion rate prior to treatment was calculated to be approximately 1,090 pounds per year.

The estimated road should erosion rate after treatment was calculated to be approximately 327 pounds per year.

1.2 Estimated Cut Bank Erosion:

The cut bank erosion rate was based on the following preliminary estimates and assumptions:

- -Average cut bank slope length of 10 FT
- -Length of toe of cut bank of 300 FT
- -A slope angle of 1:1
- -USLE Conversion Factor of 2.06 (based on Table B-2 from the previously referenced document)
- -An Erosion Reduction Efficiency of 0.9 (based on the Question 12 Cost Estimator from the previously referenced document for a rock riprap {medium} cut bank treatment)

The estimated cut bank erosion rate prior to treatment was calculated to be approximately 6,180 pounds per year.

The estimated cut bank erosion rate after treatment was calculated to be approximately 618 pounds per year.

2 Estimated Erosion Rate in Bare Earth Channels:

The erosion rate from bare earth channels was not considered as applicable to the proposed project at this time. Therefore, no estimate of the erosion rate was made for this class of erosion.

3 Estimated Erosion Rate from a Drainage Area Served by Basins and Sediment Trap:

The erosion rate for this class of erosion was based on the following preliminary estimates and assumptions:

-It was assumed that the erosion from the road shoulders and cut banks will flow directly to the sediment basin.

-An erosion reduction efficiency of 0.70 (based on the Question 12 Project Estimator from the previously referenced document for a basin treatment)

The estimated erosion rate prior to treatment was calculated to be approximately 945 pounds per year.

The estimated erosion rate after treatment was calculated to be approximately 284 pounds per year.

3.1 Estimated Erosion Rate from Road Abrasives:

The estimated erosion rate from road abrasives which are typically applied on driving areas to prevent slipping was based on the following preliminary estimates and assumptions:

-It was assumed that on an average year road abrasives would be applied 20 separate times to driving areas.

-A road abrasive application rate of 300 pounds per single lane mile (the application rate is highly variable depending on the storm, however a range of rates between 100 -- 300 pounds per single lane mile is generally accepted (Wisconsin Transportation Bulletin No. 6: Using Salt and Sand for Winter Road Maintenance by the Wisconsin Transportation Center, Revised 1996)

-An area of approximately 6.7 Acres translates to roughly 4.6 single lane miles

The estimated erosion rate prior to treatment was calculated to be approximately 27,600 pounds per year.

The estimated erosion rate after treatment was calculated to be approximately 8,280 pounds per year.

4 Estimating Run-off Treatment Benefits:

The benefit of providing the various treatments proposed by this project was calculated by multiplying the average annual retention volume by the design life and then dividing but the total estimated project costs. The sample calculations

for this analysis are provided within the following pages. The analysis was based on the following preliminary estimates and assumptions:

-The average retention volume was determined by multiplying 1 Inch of rainfall over the proposed treatment area of approximately 6.7 Acres and the multiplying by 5 to account for an average amount of volume to be realized during one year.

-A design life of 20 years was assumed for this project since that is the minimum length the applicant is responsible for operation and maintenance.

-A project cost of $2,087,562.27 was estimated from the schematic of the proposed improvements applied to the unit costs of the Project Estimator

The estimated Benefit to Cost Analysis for the storm water treatment storage for this project was calculated to be approximately 1.17 cubic feet per dollar. On a pounds of sediment removed per dollar expended basis the estimated Benefit to Cost ratio was calculated to be approximately 0.0033 pounds per dollar. This Benefit to Cost ratio does not take sediment loading from road abrasives into account.

Taking into account the anticipated sediment loading from road abrasives the estimated Benefit to Cost Analysis (on a pounds of sediment removed per dollar expended basis) for this project was calculated to be approximately 0.0121 pounds per dollar.

Therefore, appropriately accounting for the annual application of road abrasives significantly increases the benefit to cost ratio on a pounds per sediment removed per dollar expended basis.

sheet # 1 of 3

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checked by _____ date _____

scale _____

Sample Calculations - Erosion Rates

Road Shoulder Erosion

Pre-Rate = [width] x [length] x [USLE Conversion Factor]

Pre-Rate = [10 FT] x [3,785 FT] [0.0288] = 1,090 #/yr

Post-Rate = [Pre-Rate] x [1.0 - Erosion Reduction Efficiency]

Post-Rate = [1,090 #/yr] x [1.0 - 0.7] = 327 #/yr

Cut Bank Erosion

Pre-Rate = [Slope Length] x [Toe Length] x [USLE Conversion Factor]

Pre-Rate = [10 FT] x [300 FT] x [2.06] = 6,180 #/yr

Post-Rate = [Pre-Rate] x [1.0 - Erosion Reduction Efficiency]

Post-Rate = [6,180 #/yr] x [1.0 - 0.9] = 618 #/yr

Sediment Entering Basin

Pre-Rate = [Shoulder Post-Rate] + [Cut Bank Post-Rate]

Pre-Rate = [327 #/yr] + [618 #/yr] = 945 #/yr

Post-Rate = [Pre-Rate] x [1.0 - Erosion Reduction Efficiency]

Post-Rate = [945 #/yr] x [1.0 - 0.70] = 284 #/yr

sheet # 2 of 3

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Sample Calculations - Estimating Run-off Treatment

Benefit/Cost Analysis $\Rightarrow \dfrac{[\text{Retention Volume}] \times [\text{Service Life}]}{[\text{Project Cost}]}$

Retention Volume $= \Sigma [\text{Structure Volume}] \times 5$

Structure Volume $= [\text{Project Impervious Area}] \times [\text{1-Inch}]$

Structure Volume $= \left[\dfrac{6.7\ \text{Ac}}{1}\right] \times \left[\dfrac{43560\ \text{ft}^2}{\text{Ac}}\right] \left[\dfrac{\text{ft}}{12\ \text{inch}}\right] = 24,321\ \text{ft}^3$

Retention Volume $= [24,321\ \text{ft}^3] \times [5] = 121,605\ \text{ft}^3/\text{yr}$

Service Life = 20 years

Project Cost = $2,087,562.27

Benefit/Cost Analysis $= \dfrac{[121,605\ \text{ft}^3/\text{yr}] \times [20\ \text{yr}]}{\$2,087,562.27} = 1.17\ \text{ft}^3/\$$

sheet # 3 of

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Sample Calculations - Erosion Rates w/ Road Abrasives

Sediment Entering Basin

Pre-Rate = [Shoulder Pos-Rate] + [Cut Bank Post-Rate] + [Road Abrasive Rate]

Shoulder Post-Rate = 327 #/yr

Cut Bank Post-Rate = 618 #/yr

Road Abrasive Rate = [# of Applications] × [Application Rate] × [Area]

# of Applications = 20 → (assumed)

Application Rate = 300 # / single lane mile → (see note #1)

$$\text{Area} = \left[\frac{6.7 \text{ Acres}}{1}\right]\left[\frac{43560 \text{ SF}}{\text{Acre}}\right]\left[\frac{1 \text{ lane}}{12 \text{ ft}}\right]\left[\frac{5280 \text{ ft}}{\text{mile}}\right]^{-1}$$

Area = 4.6 single lane miles

$$\text{Road Abrasive Rate} = \left[\frac{20}{1}\right] \times \left[\frac{300 \#}{\text{single lane miles}}\right] \times \left[\frac{4.6 \text{ single lane miles}}{1}\right]$$

Road Abrasive Rate = 27,600 #/yr

Pre-Rate = [327 #/yr] + [618 #/yr] + [27,600 #/yr] = 28,545 #/yr

Post-Rate = [28,545 #/yr] × [1.0 − 0.70] = 8,564 #/yr

Annual Sediment Reduction

Reduction = [Pre-Treatment Loading] − [Post-Treatment Loading]

Reduction = [1,090 #/yr + 6,180 #/yr + ~~715 #/yr~~ 27,600 #/yr] − [327 #/yr + 618 #/yr + 8564 #/yr]

Reduction = [34,870 #/yr] − [9,509 #/yr] = 25,361 #/yr

Note #1: "Wisconsin Transportation Bulletin No. 6: Using Salt & Sand for Winter Road Maintenance" by Wisconsin Transportation Center, revised March 1996

U.S. ROADS

Road Management Journal

December 1, 1997
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Using Salt and Sand for Winter Road Maintenance

(This information is reproduced with permission from "Wisconsin Transportation Bulletin No. 6: Using Salt and Sand for Winter Road Maintenance" (revised March 1996 © 1996, Wisconsin Transportation Center). The Wisconsin Transportation Bulletins are a series of fact sheets on street and highway design, construction, maintenance, and management.)

To make winter roads passable, highway personnel usually must either apply chemical de-icers to melt ice and snow or spread sand to provide traction. Since chemicals and sand are costly and may have negative environmental impacts, you need to know how they work. This publication gives you basic information and practical tips on using de-icing chemicals and sand.

DE-ICING WITH CHEMICALS

Clearing winter roads to the bare pavement usually requires de-icing chemicals. In Wisconsin the most common chemical is salt (sodium chloride) which usually comes from mined rock salt that has been crushed, screened, and treated with an anti-caking agent. De-icing salt is relatively light--just over one ton per cubic yard--and comes as a mixture of three-eighths inch granules to fine crystals.

Another commonly used chemical, calcium chloride, comes from natural brines. It comes dry in pellets or flakes, or in solutions of various concentrations.

Research continues on alternative de-icing chemicals. Calcium magnesium acetate (CMA) is being produced and has few of the negative environmental impacts associated with salt and calcium chloride. Additives to reduce chemicals' corrosive properties are also being used. Currently these alternative materials are more expensive, but can be useful in special situations.

De-icing chemicals work by lowering the freezing point of water. A 23.3% concentration of salt water freezes at -6o F and a 29.8% solution of calcium chloride freezes at -67o F. These low freezing points are what makes salt and calcium chloride

useful.

Before a dry de-icing chemical can act it must dissolve into a brine solution. The necessary moisture can come from snow on the road surface or from water vapor in the air (humidity). Calcium chloride has the ability to attract moisture directly from the air.

Changing ice or snow into water requires heat from the air, the sun, the pavement, or traffic friction. Even when the pavement is below freezing, it holds some heat and can help melt snow and ice.

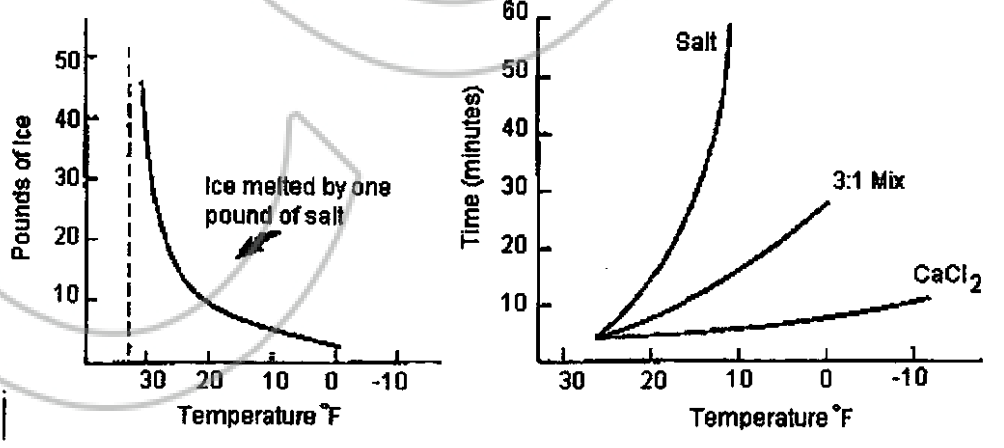
Factors affecting de-icing action

Chemical concentration, time, pavement temperatures, weather conditions, type of road surface, topography, traffic volume, width of application, and, most importantly, time of chemical application all affect the process of melting snow and ice.

Concentration If too much chemical is used, not all of it will dissolve into solution and some will be wasted. Too little chemical may not sufficiently lower the solution's freezing point. The ice will not melt or melted snow may refreeze and waste the chemical. See "Spreading rates" for recommended concentrations.

Temperature The surface temperature of a snow- or ice-covered road determines de-icing chemical amounts and melting rates. As temperatures go down, the amount of de-icer needed to melt a given quantity of ice increases significantly. The graph [below] shows that salt can melt five times as much ice at 30o F as at 20o F. The effectiveness of de-icing is sensitive to small differences in pavement temperatures.

Time The longer a de-icing chemical has to react, the greater the amount of melting (see graph). At temperatures above 20o F both salt and calcium chloride can melt ice in a reasonable time. At lower temperatures salt takes much longer.



The graph on the left shows that salt melts more ice per pound at higher temperatures. The graph at right shows the comparative time for different compounds to melt 1/8" of glare ice.

Weather The sun's heat warms the pavement, speeding up melting. Radiant heat may cause the pavement temperature to rise 10o F or more above the air temperature. On clear nights, pavement temperatures will be lower than air temperatures. Use less chemical when temperatures are rising and more when they are falling.

Applying chemicals during blowing snow and cold temperatures will cause drifting snow to stick to the pavement. If chemicals are not used, the dry snow is likely to blow off the cold road surface.

Road surface type Snow and ice melt more rapidly on a concrete surface because it gives up heat more rapidly. Because asphalt absorbs more solar radiation it may have more heat available for melting snow. This is why snow melts rapidly next to bare asphalt pavement areas.

Topography Ice tends to form where topographic conditions, like high banks or vegetation, screen the road surface from the sun. The longer the area is shaded, the more likely that ice will form. Since pavement temperatures are lower in shaded areas, you may need more chemicals there.

Application width Studies show that snow melts faster when salt is applied in narrow strips. The amount of snow melted over a long period of time is the same, however, regardless of application width. If you concentrate spreading (windrowing), you can expose a portion of road surface to the sun quickly. It can then absorb heat and increase the melting rate.

After a road is first plowed, de-icing chemicals are usually applied in a windrow two to four feet wide down the middle of a two-lane road. To remove glare ice or keep snow in a plowable condition, you may want to apply chemicals across a broader portion of the road.

Time of Application Timing is the most important factor in successfully clearing snow by chemical treatment. Early application is critical. Spreading a small amount of de- icer when snow is loose and unpacked melts a little snow and turns the rest to slush. Traffic cannot pack down this slushy snow which is 15% to 30% water. This lets plows remove it easily.

It is better to reapply chemicals as needed than to over-treat initially. Do not plow off the chemical until it has a chance to melt the snow and ice.

Environmental impact

A major concern in using chemicals for winter road maintenance is environmental impact. Studies show that soils, vegetation, water, highway facilities, and vehicles are all affected, so it is very important to use chemicals wisely. Most soil and vegetation damage occurs within 60 feet of the road and is greatest close to the pavement.

De-icing chemicals are highly soluble and follow any water flow. Salt concentrations in Wisconsin's surface and ground water have increased since the early 1960's, the [Wisconsin] Department of Natural Resources [WDNR] reports, but aquatic life has not yet been affected that we know of. In drinking water sources, which the WDNR also monitors, salt concentrations are within recognized safe limits. In some reported cases, groundwater carrying de-icing chemicals has contaminated wells, but most of these apparently were caused by seepage from poor storage facilities.

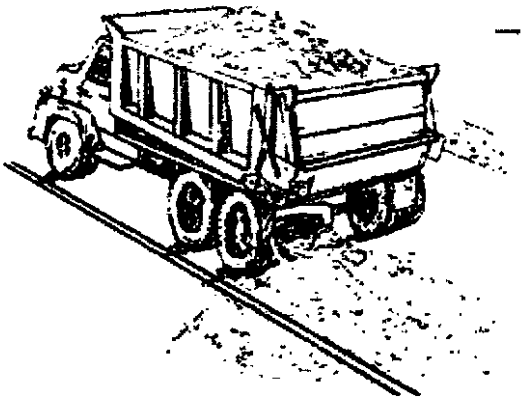
De-icing chemicals can accelerate deterioration in concrete and steel structures. New construction methods are reducing this impact, but highways and bridges do suffer from chemical damage. Vehicle corrosion is also accelerated. Corrosion on vehicles and structures is estimated to be the largest cost impact of chloride based chemicals. Even relatively small amounts of chloride will significantly accelerate existing corrosion.

Storage requirements

Localized environmental damage from salt has come largely from stockpile runoff. Since runoff is at maximum concentration, any exposed environmental element receives a very large dose. For that reason, you must prevent stockpile runoff from contaminating ground or surface water by covering the salt and storing it on an asphalt base so rain and melt runoff can't seep in. State regulations require highway agencies to store salt inside a covered, waterproof structure. When this is not possible, stockpiles must be covered with waterproof material and stored on a impervious pad. The facility must be reported to the Wisconsin Department of Transportation.

Spreading

Spreading rates No two storms are alike, so no single set of standards will give the proper spreading rate for all storm conditions. Generally, however, only apply enough chemical de-icer to permit plows to remove the snow or melt glare ice. Experience shows that it is most effective to spread between 100 and 300 pounds per single lane mile. Do not use any de-icer when temperatures are below its effective range. Normally, 15o to 20o F is considered the lower limit for salt. If de-icing is necessary at lower temperatures, more salt is needed and melting will take much longer. Other chemicals such as calcium chloride and magnesium chloride may be a better choice.



Because melting action spreads across the pavement to lower areas, concentrate de- icers on the center (crown) of two-lane roads and on the high side of curves.

Chute vs. Spreader A spreader with a spinner is the most common way of applying de-icers. A spinning circular plate throws the de-icer out in a semi-circle. Alternatively, a chute can distribute de-icer in a windrow on the road, usually on the centerline.

Spreaders can be equipped with automatic or ground-oriented controls. They automatically regulate application rates as truck speeds fluctuate, so the driver need not adjust the spreader controls. They are proving effective in reducing waste chemicals.

Spreader calibration Calibration is essential for controlling application rates. Different materials will spread at different rates at the same spreader control setting, so you must calibrate spreaders with the material you intend to use. Each spreader must be calibrated separately; even individual spreaders of the same model can vary widely in the amount of material they spread at the same control setting. Furthermore, spreaders operate in a very hostile environment--low temperature, lots of moisture, corrosive chemicals--so, they need to be cleaned and checked every year.

Calcium chloride

Dry calcium chloride (CaCl) requires special handling and is more costly than salt. However it is effective at temperatures below 0o F and is fast-acting. CaCl actually gives off heat when it dissolves into brine--a very beneficial characteristic. It also draws moisture from the air, providing water for initial brine formation. These unique properties make it valuable in severe conditions.

CaCl is usually stored in moisture proof bags until needed. Otherwise its ability to draw moisture can cause it to cake and form into large chunks.

A mixture of calcium chloride and salt can be very effective. Even a small amount of calcium chloride will start melting at low temperatures. The resulting brine and heat allow the salt to start working. The graph [above] shows how well a mixture (three parts

salt to one part calcium chloride) works at lower temperatures.

Pre-wetting

Pre-wetting salt has become common. Wetting provides moisture to make brine. Faster melting action may be expected. In addition, the wet salt has less tendency to bounce or be blown off the road by traffic. Savings in lost or wasted salt of over 20% to 30% are possible.

While any liquid de-icing chemical can be used to pre-wet, liquid calcium chloride is used widely. Applications of 6-10 gallons per cubic yard of salt are recommended. Calcium chloride has the added advantage of producing extra melting due to its effectiveness.

Using salt brine to pre-wet is becoming more common because of its lower cost. Some agencies are producing their own salt brine solution (23%). Liquid CMA and magnesium chloride are also used.

Some agencies spray the salt as it is loaded into the truck. However, the application is more uniform if truck-mounted equipment is used to spray the salt as it leaves the spreader. This also eliminates the problem of handling pre-wetted salt that is not immediately used.

Savings from losing less salt to bouncing and traffic action can more than pay for pre-wetting. However, these benefits only result with lower application rates.

ANTI-ICING

Anti-icing is a road maintenance strategy that tries to keep the bond between ice and the pavement surface from forming. It involves applying ice control chemicals before or at the very beginning of the storm. Using this strategy often reduces total chemical use and allows a higher level of service to the traveling public.

The strategy most commonly used now is de-icing--breaking the bond between the ice and the pavement. Obviously, this technique is required once the pavement becomes covered with snow or ice. More chemicals are needed to prevent the initial formation of the ice-pavement bond.

Anti-icing is being evaluated for use on high service pavements. To use it, you need accurate pavement condition forecasts to anticipate conditions where anti-icing will be effective. It may also require chemical and equipment types which are different from those used in traditional de-icing.

Various ice control chemicals are being evaluated for anti-icing. Experience shows that liquid chemical applications are more likely to succeed. Liquid salt, magnesium chloride, calcium chloride, CMA, and potassium acetate are being evaluated. Pre-wetted dry chemicals may also prove effective.

Studies during actual storm conditions show that anti-icing produces equal or better road conditions with less chemical use. Liquid chemicals can be applied at fairly low rates (25 to 50 gallons per mile). These liquid chemicals remain on the pavement long enough to work. Several reports note residual effects for several days. The fairly light application rates produce a damp surface rather than flooding it. Of course, the pavement temperatures have to be compatible with the effective operating temperatures for the chemical being applied.

Problems can develop if heavy precipitation continues and the storm gets ahead of the anti-icing efforts. Heavy rain, freezing rain, or intense snowfall rates can cause a problem. Under these conditions you should switch to a normal de-icing approach to accomplish cleanup.

ABRASIVES

Sand and other abrasives improve vehicle traction on snow- and ice-covered roads. They can be used at all temperatures and are especially valuable when it is too cold for chemical de-icers to work. Sand is the most common abrasive, but slag, cinders, and bottom ash from power plants are also used.

Environmental impacts

Abrasives used for winter road maintenance have some negative environmental impact. They can clog storm water inlets and sewers.

Cleanup may be necessary in urban areas, on bridge decks, and in ditches. The materials may wash downstream and end up in streams and lakes.

Abrasives must be treated with salt to keep them unfrozen and usable. This salt has the same potential impacts described earlier. In particular, salt-treated abrasives can accelerate vehicle corrosion.

Recent concern has been raised in areas with air pollution. Air pollution from particles less than 10 microns in size (pm 10) has been documented from winter abrasive use. As a result, cleaner abrasives and quicker cleanup after the storm are being required in areas with severe air pollution problems.

Abrasive quality

Some sand and abrasives will be more effective than others. For better traction, use material with crushed or angular particles for better traction. Rounded particles are less effective. Very small particles and dirt are actually harmful to traction. Material larger than the #50 sieve is most effective. To minimize windshield damage, use materials in which all particles are smaller than three-eighths inch.

Combining with chemicals

Treating sand with 50-100 pounds of salt per cubic yard is necessary to keep it from becoming frozen and unworkable. It also helps to anchor the sand into the ice surface, makes the sand easier to load from the stockpile, and makes it spread more evenly from mechanical spreaders.

If slag, cinders, or other abrasives are wet they also need salt to be usable. Add the same amount of salt as for sand. Pre-wetting sand with a liquid de-icing chemical just before spreading has proven effective in embedding the abrasive on icy pavements.

Sometimes de-icing chemicals are mixed more heavily with sand. The sand gives immediate traction and the chemicals may melt the snow later when the temperature rises. To be effective the chemical must remain on the pavement, which is difficult to achieve in most cases. Mixing with sand reduces the salt's melting effectiveness.

Abrasive application

Abrasives are usually applied only at hazardous locations such as curves, intersections, railroad crossings, and hills. Rates of 500 pounds to two cubic yards per mile are common. It is important to calibrate spreaders to control application rates.

Since abrasives must stay on the surface to be effective, they should not be used when they will be covered with more snow or when they will be blown off quickly by traffic. Heavy traffic reduces the effectiveness, requiring repeated application.

Storage requirements

State regulations also require that abrasives treated with salt meet certain storage requirements. All salt-treated abrasives must be covered from April 1 to October 1 each year. If the abrasive has more than 5% salt by weight (approximately 140 pounds per cubic yard) it is considered the same as salt and must be covered all year and stored on an impervious base.

All salt and abrasive storage facilities must be reported to the Wisconsin Department of Transportation which conducts an annual inspection.

Back to Index **Top of Page**

PROJECT COST ESTIMATOR							
Project Name:	Warrior Way Erosion Management & Water Quality Project						
Sponsor:	Douglas County						
Description of Work	**Quantity**	**Unit**	**Unit Price**	**Amount**	**Erosion Reduction Efficiency**	**Erosion Before (Pounds/Year)**	**Erosion After (Pounds/Year)**
Miscellaneous:							
Mobilization/Demobilization	$1,457,385.35	LS	5% of Construction	$72,868.27			
Traffic Control	$1,457,366.35	LS	2% of Construction	$29,147.33			
Erosion/Pollution Control	$1,457,367.35	LS	2.5% of Construction	$36,434.18			
Cut/Fill Slope:							
Rock Rip-Rap (Medium)	333	SY	$52.00	$17,316.00	0.90		
				$0.00	0.90		
Vegetative:					0.90		
Ravag Type D (Seed/Straw/Tackifier)	4205	SY	$0.27	$1,135.35	0.70		
Road Shoulder:							
Wood Post Barrier	300	EA	$200.00	$60,000.00			
Rail Fence (Pole)	3785	LF	$22.00	$83,270.00			
Ditch:							
Rock Lined C (3' x 5')	1900	LF	$61.00	$115,900.00	0.90		
Vegetated Swale w/mat	462	SY	$18.00	$8,316.00	0.60		
				$0.00			
Inlets/Outlets:							
Drop Inlet (3' x 3')	6	EA	$2,010.00	$12,060.00			
Runoff Conveyance:							
Curb and Gutter, Concrete	3000	LF	$22.00	$66,000.00	1.00		
CMP 24"	270	LF	$51.00	$13,770.00	1.00		
FES CMP 24"	6	EA	$350.00	$2,100.00	1.00		
Sediment Treatment:							
Oil, Salt, Sand Sep.	4	EA	$17,000.00	$68,000.00	Trap Volume		
Basin (Riser/Spill, 25' x 35' X 3', Rip-Rap Berm)	3	EA	$11,500.00	$34,500.00	0.70		
Earthwork:							
Excavation	2500	CY	$18.00	$45,000.00			
Spoil Removal	2000	CY	$20.00	$40,000.00			
Topsoil (w/50% organics)	2500	CY	$35.00	$87,500.00			
Temporary Haul Road	500	LF	$15.00	$7,500.00			
Other:							
Surface Flow Wetland	15000	SF	$20.00	$300,000.00			
Sub-surface flow wetland	11000	CF	$35.00	$385,000.00			
Nutrient Removal Swale	500	CF	$20.00	$10,000.00			
Irrigation System	1	LS	$100,000.00	$100,000.00			
PLRM Model	1	LS	$10,000.00	$10,000.00			
(1) Subtotal Construction Cost:				$1,605,817.13			
(2) Administration	$1,605,817.13	LS	5% of Construction	$80,290.86			
(3) Engineering	$1,605,817.13	LS	25% of Construction	$401,454.28			
(4) Total Project Cost (1+2+3)				$2,087,562.27			
(5) Annual Sediment or Erosion Reduction				6,986	lbs.		
Benefit/Cost (Pounds/Dollar) (5/4)				0.0033	lbs./$		

PROJECT COST ESTIMATOR							
Project Name:	Warrior Way Erosion Management & Water Quality Project Accounting for Sediment Load from Road Abrasives						
Sponsor:	Douglas County						
Description of Work	**Quantity**	**Unit**	**Unit Price**	**Amount**	**Erosion Reduction Efficiency**	**Erosion Before (Pounds/Year)**	**Erosion After (Pounds/Year)**
Miscellaneous:							
Mobilization/Demobilization	$1,457,365.35	LS	5% of Construction	$72,868.27			
Traffic Control	$1,457,366.35	LS	2% of Construction	$29,147.33			
Erosion/Pollution Control	$1,457,367.35	LS	2.5% of Construction	$36,434.18			
Cut/Fill Slope:							
Rock Rip-Rap (Medium)	333	SY	$52.00	$17,316.00	0.90		
				$0.00	0.90		
Vegetative:					0.90		
Reveg Type D (Seed/Straw/Tackifier)	4205	SY	$0.27	$1,135.35	0.70		
Road Shoulder:							
Wood Post Barrier	300	EA	$200.00	$60,000.00			
Rail Fence (Pole)	3785	LF	$22.00	$83,270.00			
Ditch:							
Rock Lined C (3' x 5')	1900	LF	$61.00	$115,900.00	0.90		
Vegetated Swale w/mat	462	SY	$18.00	$8,316.00	0.60		
				$0.00			
Inlets/Outlets:							
Drop Inlet (3' x 3')	6	EA	$2,010.00	$12,060.00			
Runoff Conveyance:							
Curb and Gutter, Concrete	3000	LF	$22.00	$66,000.00	1.00		
CMP 24"	270	LF	$51.00	$13,770.00	1.00		
FES CMP 24"	6	EA	$350.00	$2,100.00	1.00		
Sediment Treatment:							
Oil, Salt, Sand Sep.	4	EA	$17,000.00	$68,000.00	Trap Volume		
Basin (Riser/Spill, 25' x 35' X 3', Rip-Rap Berm)	3	EA	$11,500.00	$34,500.00	0.70		
Earthwork:							
Excavation	2500	CY	$18.00	$45,000.00			
Spoil Removal	2000	CY	$20.00	$40,000.00			
Topsoil (w/50% organics)	2500	CY	$35.00	$87,500.00			
Temporary Haul Road	500	LF	$15.00	$7,500.00			
Other:							
Surface Flow Wetland	15000	SF	$20.00	$300,000.00			
Sub-surface flow wetland	11000	CF	$35.00	$385,000.00			
Nutrient Removal Swale	500	CF	$20.00	$10,000.00			
Irrigation System	1	LS	$100,000.00	$100,000.00			
PLRM Model	1	LS	$10,000.00	$10,000.00			
(1) Subtotal Construction Cost:				$1,605,817.13			
(2) Administration	$1,605,817.13	LS	5% of Construction	$80,290.86			
(3) Engineering	$1,605,817.13	LS	25% of Construction	$401,454.28			
(4) Total Project Cost (1+2+3)				$2,087,562.27			
(5) Annual Sediment or Erosion Reduction				25,361	lbs.		
Benefit/Cost (Pounds/Dollar) (5/4)				0.0121	lbs./$		

Douglas County School District

1638 Mono Avenue • Box 1888 • Minden, Nevada 89423

October 28, 2009

RECEIVED
OCT 2 2009
BY:.....

Mahmood Azad, P.E.
County Engineer
Douglas County Community Development
PO Box 218
Minden, NV 89423

Re: Warrior Way BMP Project

Dear Mr. Azad:

Please allow this correspondence to provide confirmation that Douglas County and Douglas County School District have discussed the possibility of participating in a project to improve or install Best Management Practices on Warrior Way in Zephyr Cove, Nevada.

Further, Douglas County School District welcomes the opportunity to partner with Douglas County on this project to achieve similar goals that will benefit both entities.

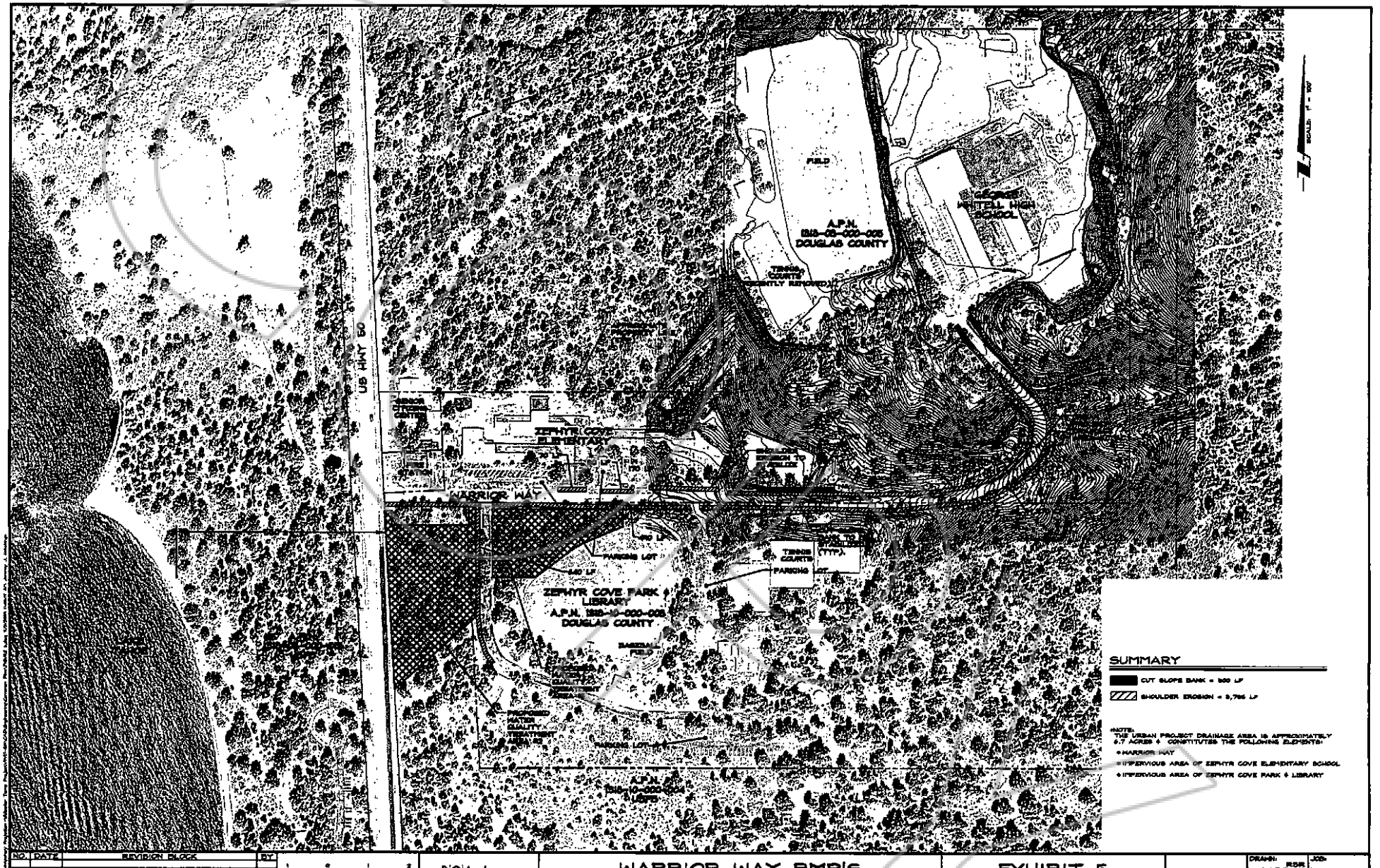
Please understand that DCSD is limited by current budget constraints from making any significant financial contributions to the project. However, DCSD will be more than willing to work cooperatively with the County in regards to granting easements, or perhaps access that may assist with the successful completion of the work.

Sincerely,

Holly Luna,
Chief Financial Officer

Information

Phone: (775) 782-5134
Fax: (775) 782-3162
www.dcsd.k12.nv.us



NO.	DATE	REVISION BLOCK	BY

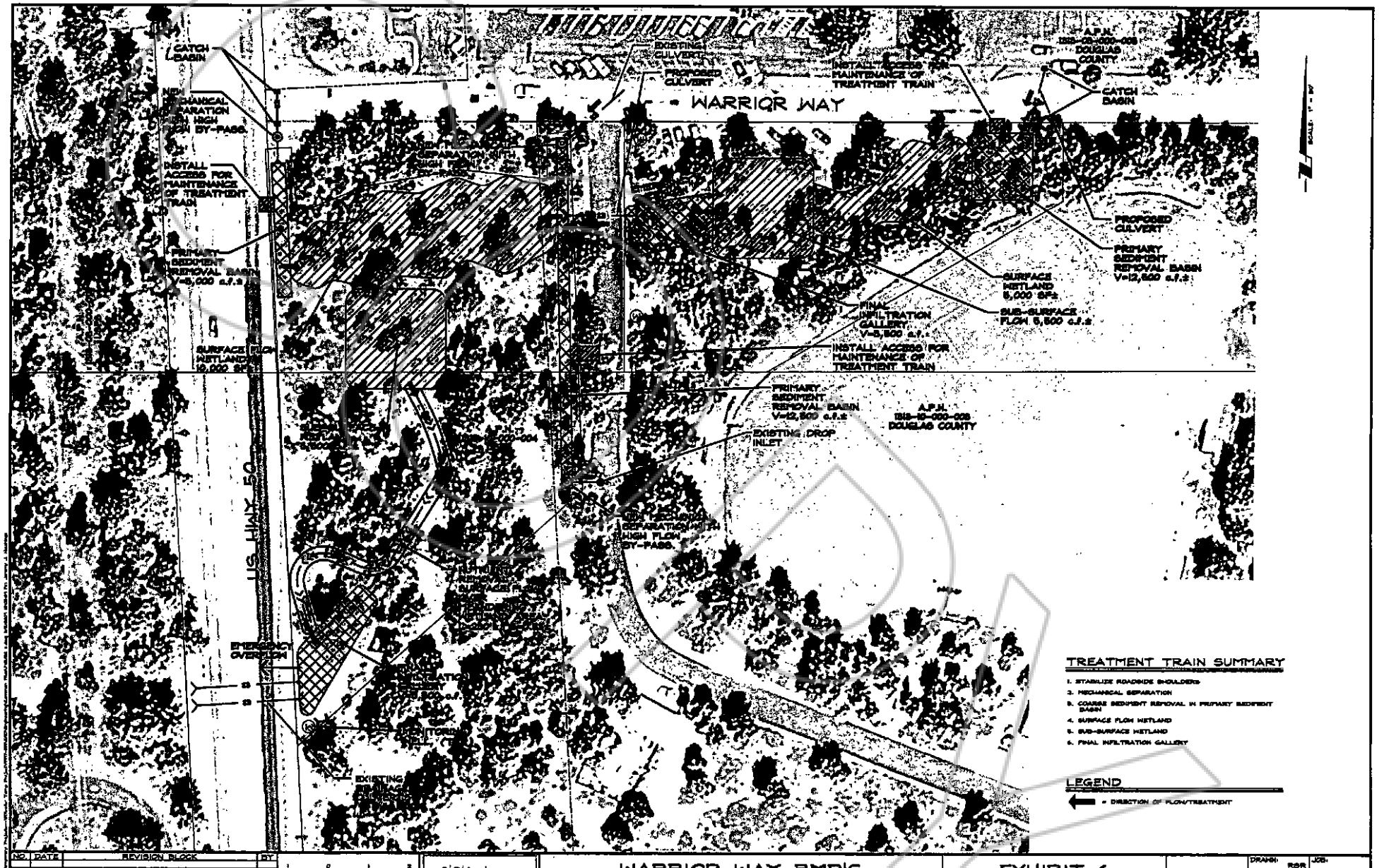
SCALE: 1" = 100'

R|O|Anderson

WARRIOR WAY BMP'S
DOUGLAS COUNTY

EXHIBIT 5

DRAWN: RSR | JOB:
ENGINEER: JJH | DRAWING:
SCALE: 1" = 100' | SHEET:
DATE: 11/02/09 | OF: SHEETS



NO.	DATE	REVISION BLOCK	BY

SCALE: 1" = 50'

R|O|Anderson

WARRIOR WAY BMP'S
DOUGLAS COUNTY

EXHIBIT 6

DRAWN:	RDR
ENGINEER:	JJH
SCALE:	1" = 50'
DATE:	11/02/09
JOB:	
DRAWING:	
SHEET:	
OF:	SHEETS

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DOUGLAS COUNTY
GREAT PEOPLE ▲ GREAT PLACES

COMMUNITY DEVELOPMENT
1594 Esmeralda Avenue, Minden, Nevada 89423

Mahmood Azad, P.E.
COUNTY ENGINEER

775-782-9063
FAX: 775-782-6297
website: www.douglascountynv.gov

Planning Division
Engineering Division
Building Division
Regional Transportation
Code Enforcement

December 4, 2009

Ms. Elizabeth Harrison
Water Quality Program Manager
NEVADA TAHOE RESOURCE TEAM
NEVADA STATE DIVISION OF LANDS
901 S. Stewart Street, Suite 5003
Carson City, NV 89701

NDSL Water Quality and Erosion Grant Proposal – Warrior Way Revision to Amount of Grant Request

Dear Ms. Harrison:

Thank you for your letter of November 23, 2009, regarding comments on the Warrior Way project. We have reviewed your recommendations on adjusting the grant funding amounts based on elimination of the proposed surface and sub-surface wetlands in favor of a more traditional mitigation method and incorporated these recommendations into a revised project and Total Project Cost.

Please find attached to this letter a revision to the Project Cost Estimator and Erosion Estimator. We have revised the proposed treatment area to only include the right-of-way along Warrior Way. Therefore you will also note a difference in the Benefit/Cost Ratio. The revised cost total is $1,180,812.27, therefore we are requesting $590,406.14 in grant funding from NDSL.

Should you have additional questions please do not hesitate to contact me directly at (775) 782-9063 or email at mazad@co.douglas.nv.us. We look forward to working with you on this project. We are, as always, at your service.

Sincerely,

Mahmood Azad

Mahmood Azad, P.E.
Douglas County Engineer

Attachments: Project Cost Estimator
Erosion Estimator

PROJECT COST ESTIMATOR							
Project Name:	Warrior Way Erosion Management & Water Quality Project Accounting for Sediment Load from Road Abrasives						
Sponsor:	Douglas County						
Description of Work	**Quantity**	**Unit**	**Unit Price**	**Amount**	**Erosion Reduction Efficiency**	**Erosion Before (Pounds/Year)**	**Erosion After (Pounds/Year)**
Miscellaneous:							
Mobilization/Demobilization	$1,457,365.35	LS	5% of Construction	$72,868.27			
Traffic Control	$1,457,366.35	LS	2% of Construction	$29,147.33			
Erosion/Pollution Control	$1,457,367.35	LS	2.5% of Construction	$36,434.18			
Cut/Fill Slope:							
Rock Rip-Rap (Medium)	333	SY	$52.00	$17,316.00	0.90		
				$0.00	0.90		
Vegetative:					0.90		
Reveg Type D (Seed/Straw/Tackifier)	4205	SY	$0.27	$1,135.35	0.70		
Road Shoulder:							
Wood Post Barrier	300	EA	$200.00	$60,000.00			
Rail Fence (Pole)	3785	LF	$22.00	$83,270.00			
Ditch:							
Rock Lined C (3' x 5')	1900	LF	$61.00	$115,900.00	0.90		
Vegetated Swale w/mat	462	SY	$18.00	$8,316.00	0.60		
				$0.00			
Inlets/Outlets:							
Drop Inlet (3' x 3')	6	EA	$2,010.00	$12,060.00			
Runoff Conveyance:							
Curb and Gutter, Concrete	3000	LF	$22.00	$66,000.00	1.00		
CMP 24"	270	LF	$51.00	$13,770.00	1.00		
FES CMP 24"	6	EA	$350.00	$2,100.00	1.00		
Sediment Treatment:							
Oil, Salt, Sand Sep.	4	EA	$17,000.00	$68,000.00	Trap Volume		
Basin (Riser/Spill, 25' x 35' X 3', Rip-Rap Berm)	3	EA	$11,500.00	$34,500.00	0.70		
Earthwork:							
Excavation	2500	CY	$18.00	$45,000.00			
Spoil Removal	2000	CY	$20.00	$40,000.00			
Topsoil (w/50% organics)	2500	CY	$35.00	$87,500.00			
Temporary Haul Road	500	LF	$15.00	$7,500.00			
Other:							
NEPA	1	LS	$10,000.00	$10,000.00			
Overflow Nutrient Removal Swale	500	LF	$125.00	$62,500.00			
Temporary Irrigation System	1	LS	$10,000.00	$10,000.00			
Permanent Irrigation System for Swale	1	LS	$15,000.00	$15,000.00			
PLRM Model	1	LS	$10,000.00	$10,000.00			
(1) Subtotal Construction Cost:				$908,317.13			
(2) Administration	$908,317.13	LS	5% of Construction	$45,415.86			
(3) Engineering	$908,317.13	LS	25% of Construction	$227,079.28			
(4) Total Project Cost (1+2+3)				$1,180,812.27			
(5) Annual Sediment or Erosion Reduction				11,018	lbs.		
Benefit/Cost (Pounds/Dollar) (5/4)				0.0093	lbs./$		

sheet # 3 of

R O Anderson

Post Office Box 2229 Minden, NV 89423
775.782.2322 775.782.7084
www.ROAnderson.com

JOB: Warrior Way

calculated by JSH date 10/30/09 JSH

checked by date

scale

revised 12/02

Sample Calculations - Erosion Rates w/ Road Abrasives

Sediment Entering Basin

Pre-Rate = [Shoulder Pos-Rate] + [Cut Bank Post Rate] + [Road Abrasive Rate]

Shoulder Post-Rate = 327 #/yr

Cut Bank Post-Rate = 618 #/yr

Road Abrasive Rate = [# of Applications] × [Application Rate] × [Area]

# of Applications = 20 → (assumed)

Application Rate = 300 # / single lane mile → (see note #1)

$$\text{Area} = \left[\frac{617 \text{ Acres}}{1}\right]\left[\frac{43560 \text{ SF}}{\text{Acre}}\right]\left[\frac{1 \text{ lane}}{12 \text{ ft}}\right]\left[\frac{5280 \text{ ft}}{\text{mile}}\right]^{-1}$$

Area = 4.6 single lane miles

$$\text{Road Abrasive Rate} = \left[\frac{20}{1}\right]\left[\frac{300 \#}{\text{single lane miles}}\right]\left[\frac{4.6 \text{ single lane miles}}{1}\right]$$

Road Abrasive Rate = 27,600 #/yr

Pre-Rate = [327 #/yr] + [618 #/yr] + [27,600 #/yr] = 28,545 #/yr

Post-Rate = [28,545 #/yr] × [1.0 - 0.70] = 8,564 #/yr

Annual Sediment Reduction

Reduction = [Pre-Treatment Loading] - [Post-Treatment Loading]

Reduction = [1,090 #/yr + 6,180 #/yr + 27,600 #/yr] - [327 #/yr + 618 #/yr + 8,564 #/yr]

Reduction = [34,870 #/yr] - [9,509 #/yr] = 25,361 #/yr

Note #1: "Wisconsin Transportation Bulletin No. 6: Using Salt & Sand for Winter Road Maintenance" by Wisconsin Transportation Center, revised March 1996

CERTIFIED COPY

The document to which this certificate is attached is a full, true and correct copy of the original on file and on record in my office.

DATE: May 26, 2010

THERESA Clerk of the 9th Judicial District Court of the State of Nevada, in and for the County of Douglas.

By Carol M. Penlock Deputy