

Truckee River



Flood Management Project

FLOOD PROJECT
TECHNICAL ADVISORY COMMITTEE

NOTICE OF MEETING
AND
AGENDA

FRIDAY – OCTOBER 1, 2010 - 10:00 A.M.

**Washoe County
Public Works Conference Room
1001 E. 9th Street, Bldg A
Reno, Nevada**

**Dan St. John, Chair
Wayne Seidel, Vice-Chair**

Technical Advisory Committee Members

	RENO	SPARKS	WASHOE COUNTY
VOTING	John Flansberg Susan Schlerf Kyle West	Neil Krutz Wayne Seidel - <i>Vice-Chair</i> TBD	Adrian Freund John Sherman Dan St. John - <i>Chair</i>
ALTERNATES	Charla Honey (Alt)	TBD (Alt)	Kimble Corbridge (Alt)
NON-VOTING	Water Resources	TBD	
	UNR	Kevin Piper	

Pursuant to NRS 241.020, this notice has been posted at the following locations:

Washoe County Administration, 1001 East Ninth Street, Reno, Nevada.

Sparks City Hall - City Clerk, 431 Prater Way, Sparks, Nevada.

Reno City Hall - City Clerk, One E. First St., Reno, Nevada.

Truckee River Flood Project Office, 9390 Gateway Drive, Reno, Nevada

Truckee River Flood Project website: <http://truckeeflood.us> (Click Committees, then Meeting Agendas, then scroll down to Technical Advisory Committee), **OR** go to

http://truckeeflood.us/77/technical_advisory_committee.html

PUBLIC COMMENT: In order to conduct orderly, efficient, effective and dignified meetings that promote a governmental purpose with a governmental process, public comment may address any agenda item or other public issue that the Committee has the authority to effectuate or exercise control over. Public comment on matters beyond the Committee's scope of authority is not relevant to the Committee's business, does not invoke a governmental process nor serve a governmental purpose, and is contrary to the effective, efficient and orderly business conducted by the Committee. Each person addressing the Committee shall fill out a request to speak form, step up to the microphone when called, give his/her name, and limit the time of his/her presentation to three (3) minutes. All public comment remarks shall be addressed to the Committee as a body, and not to any member thereof. No person, other than members of the Committee and the person having the floor, shall be permitted to enter into any discussion, either directly or through members of the Committee. No questions shall be asked of the Committee members, except through the presiding officer. The Committee reserves the right to determine during its meeting, through a vote of its members, whether to allow additional public comment, limited to one (1) minute per person, on specified individual items on the agenda.

NOTES: Items on the agenda may be considered in an order different than they appear on the agenda. Unless otherwise indicated by an asterisk (*), all items on the agenda are action items upon which the Flood Project TAC may act.

The meeting facility is accessible to the disabled. Persons with disabilities who require special accommodations or assistance (e.g., sign language, interpreters or assisted listening devices) at the meeting should notify Flood Project staff at 850-7460, forty-eight (48) hours before the meeting.

1. **CALL TO ORDER AND ROLL CALL - Determination of a Quorum**

2. **APPROVAL OF THE AGENDA**

3. **APPROVAL OF MINUTES**

Approve Provisional Minutes of TAC Meeting of August 27 2010.

4. * **ANNOUNCEMENTS**

5. * **PUBLIC COMMENT** - For all items on or off the agenda, limited to 3 minutes per person

6. **UPDATE ON THE US ARMY CORPS OF ENGINEERS' MODELING EFFORTS AND PROJECT SCHEDULE**

Jay Aldean, Deputy Director, Truckee River Flood Project

Discussion of progress and possible changes to the Army Corps of Engineers' (Corps) hydraulic model revision effort and expected impacts to the project schedule. Update on Corps activities for the previous month. Possible action to accept the report and/or to make recommendations to the Flood Project Coordinating Committee (FPCC.)

* denotes NON-action items

7. **DISCUSS POSSIBLE PROJECT SCHEDULE FOR AUTHORIZATION IN 2011**

Naomi Duerr, Director, Truckee River Flood Project

Discussion regarding proceeding with a more aggressive Corps project schedule to result in approval of a Chief's Report in Fall 2011 and possible inclusion of the project in the Water Resources and Development Act of 2011. Discussion will cover the merits and possible risks associated with seeking project authorization in 2011 versus 2012, including:

- 1) the potential for the early approval of a "National Economic Development Plan" only;
- 2) potential delays in completing the Locally Preferred Plan and other project components,
- 3) the capability of the Corps of Engineers to meet the project schedule; and
- 4) possible strategies to improve the schedule or the anticipated outcomes.

Possible action to make recommendations to the FPCC.

8. **REVIEW PROPOSED FLOOD PROJECT COOPERATIVE AGREEMENT (JPA)**

Naomi Duerr, Director, Truckee River Flood Project

Report on recent meetings, developments, proposals, and timelines regarding development of a new Interlocal Cooperative Agreement for the Truckee River Flood Management Project. Possible discussion and action to provide recommendations to the FPCC regarding the contents of the draft Cooperative Agreement regarding membership, governance, administration, and regulatory powers of the proposed Joint Powers Authority; the acquisition of land and the construction, ownership, operation and maintenance of flood facilities; the assessment and collection of rates and fees to pay for the project; the financing of the project; and the rights and obligations of parties to the Cooperative Agreement. Possible action to make recommendations to the FPCC.

9. **AMENDMENT TO THE FCS GROUP INC. CONTRACT REGARDING ESTABLISHMENT OF FEES TO BE COLLECTED FOR FLOOD PROJECT – NOT-TO-EXCEED \$250,000**

Naomi Duerr, Director, Truckee River Flood Project

Discussion and possible action to make recommendations to the FPCC regarding an amendment to the current contract with FCS Group for provision of consulting services and preparation of reports to be used in establishing revenue requirements of, and the rates and fees to be collected for, the financing of the Flood Project.

10. **APPROVAL OF PHASE II OF THE HYDROLOGIC MODEL CONTRACT WITH MANHARD ENGINEERING I - NOT-TO-EXCEED \$850,000**

Paul Urban, Flood Project Manager, Truckee River Flood Project

Discussion and possible action to make recommendations to the FPCC regarding a contract with Manhard Engineering for development of Phase II of a Regional Hydrologic Model (application of the model to the entire watershed) in an amount not-to-exceed \$850,000.

11. **PHASE 1 DESIGN AGREEMENT FOR THE VIRGINIA STREET BRIDGE TRACTION PROJECT IN AN AMOUNT FOR \$1.8 MILLION**

Jay Aldean, Deputy Director, Truckee River Flood Project

Discussion and possible action to make recommendations to the FPCC regarding entering into Phase 1 Design Agreement for the Virginia Street TRAction Project with the City of Reno in the amount of \$1.8 million. Phase 1 will complete the outreach and visioning process with all stakeholders and complete the preliminary design effort.

12. CONSIDERATION OF ALTERNATIVE DESIGN CONCEPTS FOR THE LOCALLY PREFERRED PLAN (LPP) TO ACCOMMODATE INCREASED FLOWS FROM NEW DEVELOPMENTS

John Flansberg, Public Works Director, City of Reno

Discussion regarding alternative design concepts for the Locally Preferred Plan. Concepts to include accommodating increased flows from new developments, future build-out scenarios, managing stormwater through regional projects, and potential funding mechanisms for this effort. Possible recommendations to FPCC to request additional staff, consultant or Corps work.

13. RECAP OF NORTH TRUCKEE DRAIN GROUNDBREAKING

Report on the groundbreaking event at the North Truckee Drain construction site on September 15, 2010.

14. REVIEW FLOOD PROJECT COORDINATING COMMITTEE DRAFT AGENDA (see attached)

Naomi Duerr, Director, Truckee River Flood Project

Possible action to make recommendations to the FPCC on any of the Flood Project Coordinating Committee draft agenda items (see attached agenda). Action may include clarification, addition or removal of agenda items, and recommendations to the project staff or the FPCC regarding any of the listed or proposed agenda items.

15. COMMITTEE MEMBER COMMENTS, REQUESTS AND FUTURE AGENDA ITEMS

Review and discussion regarding proposed TAC October 29, 2009 (Nevada Day), November 26th 2009 (Family Day) and December 31, 2010 (New Years Eve) meetings. Possible action to approve items for future agendas and/or change the date(s) of the meetings.

16. ADJOURNMENT

Truckee River Flood Management Project

**TRUCKEE RIVER FLOOD PROJECT
TECHNICAL ADVISORY COMMITTEE**
Friday, August 27, 2010
10:00 AM

DRAFT OF MINUTES

Dan St. John, Chair
Wayne Seidel, Vice Chair

Technical Advisory Committee Members

	RENO	SPARKS	WASHOE COUNTY
VOTING	John Flansberg Susan Schlerf Kyle West	Neil Krutz Wayne Seidel- <i>Vice Chair</i> TBD	Adrian Freund John Sherman Dan St. John - <i>Chair</i>
ALTERNATES	Charla Honey (Alt)	TBD (Alt)	Kimble Corbridge (Alt)
NON-VOTING	Water Resources	TBD	
	University of Nevada Reno	Kevin Piper	

1. **CALL TO ORDER AND ROLL CALL – Determination of a Quorum** **10:07 a.m.**
A regularly scheduled meeting was called to order by Chair Dan St. John at 10:07 a.m. on Friday, August 27, 2010 at the Washoe County Central Conference Room at 1001 E 9th Street, Building C, Reno, Nevada.

Committee Members present: Kyle West, Charla Honey, Neil Krutz, Adrian Freund, John Sherman, Dan St. John (quorum established)

Flood Staff Present: Naomi Duerr, Director; Jay Aldean, Deputy Director, Paul Urban, Project Manager; Lisa Diebler, Danielle Henderson, Melissa Faigeles and Greg Salter, Deputy District Attorney.

2. **APPROVAL OF AGENDA**

Director Duerr asked that item 10 be pulled from today's agenda. Neil Krutz motioned to accept the agenda. Kyle West seconded the motion. It passed unanimously.

3. **APPROVAL OF MINUTES**

Approve Provisional Minutes of TAC Meeting of August 6, 2010 – **Adrian Freund motioned to approve the minutes. Neil Kurtz seconded the motion. It passed unanimously.**

4. **ANNOUNCEMENTS**

None

5. **PUBLIC COMMENT – Limited to three minutes per person**

Chair Dan St. John opened the meeting to public comment; there was no one present to comment.

6. **UPDATE ON THE US ARMY CORPS OF ENGINEERS' MODELING EFFORTS AND PROJECT SCHEDULE**

Jay Aldean (Flood Project Deputy Director) presented a brief update on the U.S. Army Corps of Engineers (Corps), pointing out some key milestone dates on the schedule handout (on file). Recent schedule revisions have resulted in a 2-month shortening of the timeline for completion of the Chief's Report, which allows some flexibility for meeting the November 2012 Congressional Authorization milestone.

Motion to accept report made by Neil Krutz; seconded by Charla Honey. Motion passed unanimously.

7. **UPDATE ON THE UNIVERSITY OF NEVADA, RENO (UNR) MEMORANDUM OF UNDERSTANDING (MOU)**

Naomi Duerr (Flood Project Director) reported that Robert Dickens is currently briefing UNR officials on the issue; Greg Salter (Flood Project legal counsel) is drafting the MOU. Resolution of this issue is important, but is not anticipated to hinder the formation of the Flood Project Joint Powers Agreement (JPA).

Motion to accept the report made by John Sherman; seconded by Neil Krutz. Motion passed unanimously.

8. **JPA UPDATE**

Naomi Duerr provided a brief update on the JPA formation process and mentioned some tentative upcoming meeting dates.

Motion to accept the report made by Neil Krutz; seconded by John Sherman. Motion passed unanimously.

9. PLAN AND DESIGN AGREEMENT FOR TRACY POWER PLANT ECOSYSTEM RESTORATION TRACTION PROJECT

Melissa Faigeles (Flood Project Natural Resource Planner) narrated a PowerPoint presentation (on file) outlining plans to restore a portion of the Truckee River located at the Tracy Power Plant. The proposed ecosystem restoration project is one of a series of such projects planned along the Lower Truckee River reach; the Flood Project has worked with numerous partners to complete three (3) other similar restoration projects at Lockwood, 102 Ranch and Mustang Ranch. The total budget for the Tracy restoration project is estimated at about \$5 million, \$250,000 of which would be used for planning and design. Construction is slated for summer 2012.

Ms. Faigeles requested that the TAC forward the following recommendations on to the Flood Project Coordinating Committee (FPCC) for consideration: approval of the Tracy Power Plant restoration project as a TRAction Project; and approval of the development of a funding agreement between The Nature Conservancy and the Flood Project to authorize \$250,000 in Flood Project funds for use in project planning and design. It was noted that the \$250,000 had already been approved by the FPCC and included in its Fiscal Year 2010-2011 budget.

John Sherman moved to accept the recommendation as stated above; Neil Krutz seconded the motion. Motion passed unanimously.

10. NORTH TRUCKEE DRAIN TRACTION PROJECT AGREEMENT

Item was pulled.

11. APPROVAL OF PHASE II OF THE HYDROLOGIC MODEL CONTRACT WITH MANHARD ENGINEERING IN AN AMOUNT NOT TO EXCEED \$830,766.

Paul Urban (Flood Project Manager) narrated a PowerPoint presentation (on file) pertaining to Phase I the hydrologic model work performed by Manhard Engineering. Seeking approval for Phase II of this work, Mr. Urban stated that this phase would use the information from the pilot project (Phase I) and apply it to the entire project watershed. He stressed that Phase II would involve base model work, and would only focus on a selection of model modules that are of critical importance to the Flood Project, such as precipitation, storage, streams, soils, land use, and topography. Although the GSSHA model is capable of handling stormwater and water quality inputs, they were not included as part of the Phase II scope of work. If desired, future work efforts could incorporate those and other model modules.

In response to questions from Dan St. John (Washoe County), Mr. Urban stated that the Phase II work effort would involve merging the hydrologic and hydraulic models to predict changes in flow in critical flood zones—results from this work should assist managers in implementation of No Adverse Impact policies related to future development in the floodplain.

Neil Krutz (City of Sparks) voiced concerns regarding the level of detail provided in the current scope of work, stating that it might be difficult to effectively manage the contract without more detail on tasks, deliverables, schedule and budget.

Naomi Duerr stated that the scope of work would be further reviewed and revised to include more details prior to its presentation at the FPCC and Washoe County Board of County Commissioners (BCC) meetings. She offered to send TAC members the revised scope (once available) via e-mail for review and comment prior to the FPCC meeting.

Dan St. John (Washoe County) recommended approving the item, subject to revision of the scope of work (i.e., include more details on tasks, deliverables, schedule, and budget), in order to allow the project to move forward and avoid contracting delays.

A motion to approve the contract and funding request, subject to scope revision (see above) was made by Adrian Freund and seconded by Neil Krutz. The motion passed unanimously.

12. REVIEW OF FLOOD PROJECT COORDINATING COMMITTEE DRAFT AGENDA

It was mentioned that Item 10 (North Truckee Drain TRAction Project agreement) would be pulled from the FPCC agenda. No other changes were recommended.

13. COMMITTEE MEMBER REQUESTS AND FUTURE AGENDA ITEMS

Neil Krutz requested an update on the \$525M Plan for flood management.

Kerri Lanza (City of Reno), with support from Dan St. John, requested a progress report on the topic of model ordinance discussions relating to the No Adverse Impact policy.

Dan St. John expressed his appreciation of Flood Project staffs (specifically, Naomi Duerr, Paul Urban and Jay Aldean) for their quick response regarding the entitlement issue (e.g., quickly setting up meetings and making sure key decision-makers attended).

14. ADJOURNMENT

10:51AM

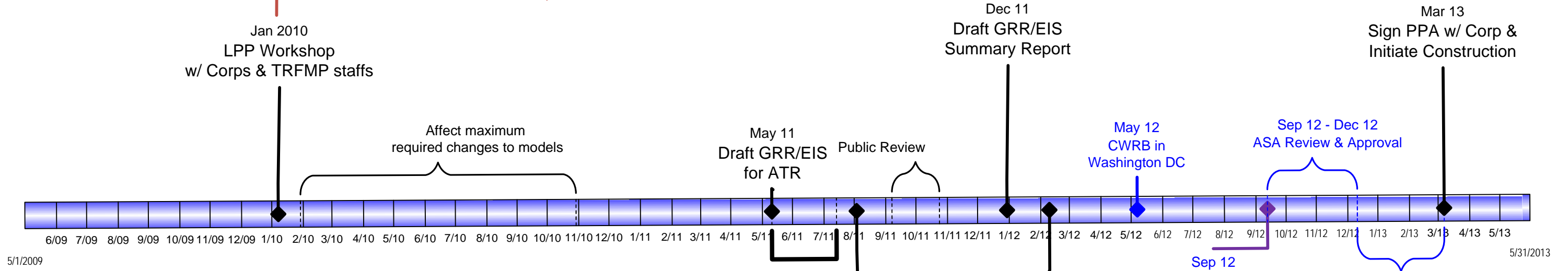
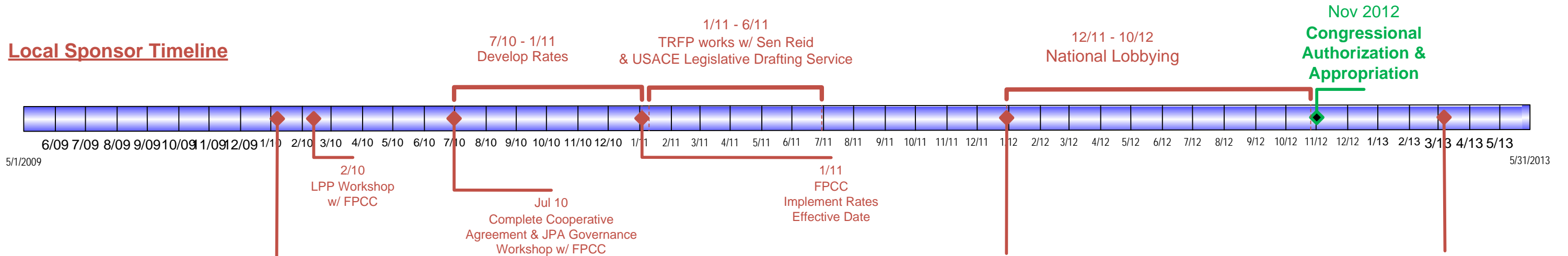
Having no further business, John Sherman moved to adjourn the meeting; Neil Krutz seconded the motion. Motion passed unanimously and the meeting adjourned at 10:51AM.

TRUCKEE RIVER FLOOD MANAGEMENT PROJECT

CORPS OF ENGINEERS' TIMELINE

FPCC MEETING OF 9-10-10

Local Sponsor Timeline



Corps Baseline Schedule

AFB = Alternative Formulation Board
The EIS Alternatives are Selected at the AFB Meeting

ASA = Assistant Secretary of the Army

JPA = Joint Powers Authority

CWRB = Civil Works Review Board

ATR = Agency Technical Review (Internal)

EIS = Environmental Impact Statement

FPCC = Flood Project Coordinating Comm.

GRR = General Re-evaluation Report

ETR = External Technical Review

OMB = Office of Management & Budget

PPA = Project Partnering Agreement

Chief's Report = Summary + GRR + EIS

LPP = Locally Preferred Plan

Color Legend

BLACK – Sacramento Corps' Responsibilities

BLUE – Corps' Headquarter Responsibilities

RED – Local Sponsor Responsibilities

GREEN – Federal Authorization

(Rev. 9-23-10 annotated to discuss significant changes from 1-21-10)

**DRAFT—FOR DISCUSSION PURPOSES ONLY
THIS IS A WORK IN PROGRESS**

Summary of Key Provisions
for the
Interlocal Cooperative Agreement
(Truckee River Flood Management Project)

While the agreement has gone through several drafts with many wording changes, the shaded text indicates significant substantive changes from the January 21 draft of this Summary reviewed by managers or early drafts of the agreement.

Topic	Terms	Reference
PARTIES TO AGREEMENT; DEFINITIONS		
<i>Parties</i>	<ul style="list-style-type: none"> • “Members” are Washoe County, City of Reno, and City of Sparks. • “Authority” will join the agreement after it becomes organized in order to accept the responsibilities and set its indemnifications to the Members. 	§1.01
<i>Key Definitions</i>	Definitions to capitalized terms in Agreement are in §1.02. For this Outline: <ul style="list-style-type: none"> • PPA is Project Partnership Agreement with U.S. Army Corps of Engineers. • Flood Management Facilities includes all flood damage control facilities (levees, floodwalls etc), ecosystem restoration facilities and recreational facilities acquired or constructed by Authority. 	§1.02
ESTABLISHMENT OF JOINT POWERS AUTHORITY		
<i>Creation</i>	Truckee River Flood Management Authority created to manage and control the Truckee River Flood Management Project.	¶3.01.A
<i>Nature of Organization</i>	<ul style="list-style-type: none"> • Body corporate and public agency (not apolitical subdivision of Nevada) • Separate entity created by interlocal agreement • Debts and obligations separate from Members • Not an agent of Members, and visa versa • Members may not be assessed to pay debts of Authority • Permanent entity until dissolved by Members or court • Boundaries are all of Washoe County • Will be a separate “local government” under NRS Chapter 354 and prepare its own budget, keep its own accounts, and do its own audits. 	¶3.01.C ¶3.01.A ¶3.01.C ¶3.01.C ¶3.01.C ¶3.01.D ¶3.01.E ¶3.08.A

<i>Governing Body</i>	<ul style="list-style-type: none"> • Board of Directors • 6 Directors, 2 appointed by each Member • Directors must be elected officials of Members • Directors serve 2 year terms unless sooner removed by Member; may serve more than one term. • Alternate Directors may be appointed • Staggered terms • Meetings covered by Open Meeting Law • Rules of Procedure for meetings to be established. • Directors, officers and employees to be indemnified 	<p>¶3.03.A ¶3.03.B</p> <p>¶3.03.B ¶3.03.B ¶3.03.B ¶3.03.B ¶3.04.D ¶3.04.E ¶3.06.C</p>
<i>Quorum & Voting Requirements</i>	<ul style="list-style-type: none"> • Quorum is majority (4 of 6) of all Directors. NRS 241.0355 regarding voting requirements and counting of abstentions applies. 	<p>¶3.05.A ¶3.05.B</p>
	<ul style="list-style-type: none"> ➤ At least 50% (4) of Directors must approve everything except as provided below. (Such as approve contracts, purchase and sell property, approve reports etc) 	<p>¶3.05.B.4</p>
	<ul style="list-style-type: none"> ➤ At least 75% (5) of Directors must approve: <ul style="list-style-type: none"> • Budgets, coverage ratios and reserves • Capital Improvement Plans (which must first be presented to Member governing bodies for consultation before the Board takes action). • Living River Plan and amendments and Infrastructure Tax Plan • Rates and Charges • Borrow money; Financing Agreements; Debt Instruments • By-Laws of Authority; regulations and policy statements involving internal operating procedures or the management of facilities or floodplains owned by Authority. 	<p>¶3.05.B.3</p>
	<ul style="list-style-type: none"> ➤ At least 75% (5) of Directors and the governing body of <i>each Affected Member</i> must approve: <ul style="list-style-type: none"> • Master Plans and regulatory measures for inclusion in the affected Member’s Development Codes • [Note: Deleted power to establishment of a Special District (Impact Fee Service Area. Local Improvement District etc) within the jurisdiction of the Member] 	<p>¶3.05.B.2</p>
	<ul style="list-style-type: none"> ➤ At least 75% (5) of Directors and the governing bodies of <i>all</i> Members must approve: <ul style="list-style-type: none"> • Amendment, modification, termination of 	<p>¶3.05.B.1</p>

	<p>Agreement</p> <ul style="list-style-type: none"> • Withdrawal or addition of a Member • Merger or combination with another entity • Dissolution of Authority 	
<i>Board Officers, Committees,</i>	<ul style="list-style-type: none"> • Board Committees to be established in By-Laws • Board Officers will be Chair and Vice Chair (who must be Directors) as will be established in By-Laws 	<p>¶3.06.B ¶3.06.A</p>
<i>Withdrawal of a Member</i>	<ul style="list-style-type: none"> • Only by agreement approved by governing bodies of all Members. Agreement must not impair collection and pledge of revenues (until existing Debt Instruments are paid in full), any covenant in outstanding Debt Instrument or financing agreement, continuing construction of the project, or Authority’s obligation under the PPA. Agreement must provide for payment or reduction of existing Debt Instruments; preserve integrity of all facilities in project; and provide for continued operation and maintenance of facilities within the withdrawing Member’s jurisdiction. 	§3.09
<i>Dissolution of Authority</i>	<ul style="list-style-type: none"> • Must be approved by 75% of Board and the governing bodies of all Members. Agreement to dissolve must provide for repayment and performance of all obligations in Debt Instruments and agreements of Authority, including any agreements with federal agencies. • On dissolution, all of the conferred functions and powers delegated to the Authority by the Members (including rate making and regulatory powers), and all of the revenues and assets of the Authority shall be <ul style="list-style-type: none"> ○ offered to any Member who agrees to assume all responsibilities of the Authority and continue the project; ○ but if no Member so agrees, then <i>may</i> be sold or conveyed to another public agency, except that all functions and powers delegated to the Authority are terminated and any Member may delegate such functions and powers to the new entity in a separate agreement; or ○ The Authority will be liquidated as follows: <ul style="list-style-type: none"> ○ All functions conferred and powers delegated to Authority are terminated; ○ Flood Management Facilities will be conveyed to the Member in whose jurisdiction where located; ○ Centralized assets will be liquidated and after payment of debts and obligations, (a) to the extent federal funds were used to buy the 	<p>¶3.05.B.1 ¶3.01.A ¶3.10.B</p>

	liquidated assets, proceeds will be distributed in accordance with federal law, (b) the balance in Infrastructure Fund goes back to Washoe County, and (c) all remaining cash will be distributed to the Members in accordance with an agreement.	
<i>Executive Director, Employees, & Counsel of Authority</i>	<ul style="list-style-type: none"> • Executive Director is chief executive officer of Authority who will serve at pleasure of the Board. Duties to be established by resolution. Director will be administratively attached to Washoe County for payroll and benefits. • Except as otherwise agreed with County, existing employees remain as employees of County and retain their salaries, seniority, benefits and rights under collective bargaining agreements. All existing and new employees will be employees of Washoe County, subject to all regulations and collective bargaining agreements of County, with same status as if Authority were a department and director were a department head of the County, except that employees are not agents of County. • Board may hire counsel who reports to and serves at pleasure of Board. [Note: Possible use of District Attorney's office deleted from agreement.] • Authority to reimburse County for all costs plus an administrative fee not to exceed 5%. 	<p>¶3.07.A</p> <p>¶8.02.B</p> <p>¶3.07.B</p> <p>¶8.02.A</p> <p>¶8.02.C</p> <p>¶3.07.C</p>
FUNCTIONS AND POWERS OF AUTHORITY		
<i>Conferred Functions</i>	<p>Following functions conferred (These functions were not listed in previous summary)</p> <p><i>Regulatory</i></p> <p>To regulate the flow and control of floodwaters and the management of floodplains along the Truckee River and its Key Tributaries within Washoe County and propose plans and regulations as provided in Article 4 of this Agreement</p> <p><i>See "Regulatory Powers" discussion below for details under Article 4;</i></p> <p>To perform emergency management functions as defined in NRS 414.035 and perform the functions of a local organization for emergency management under NRS 414.490 with respect to flooding along the Truckee River and its Key Tributaries as provided in Article 4 of this Agreement;</p> <p>To regulate the actions of residents, businesses and others</p>	<p>¶3.02.A</p>

as a collective action in conjunction with the Members, to foster the goals set forth in §2.01;

Revenue and Finance

To charge, impose, assess, levy, collect and enforce fees, rates and charges in accordance with Article 6 of this Agreement;

To establish and amend from time to time the Infrastructure Tax Plan for the Truckee River Flood Management Project as provided in Article 6 of this Agreement;

To finance acquisition, improvement, construction, equipping, operating and maintaining the Truckee River Flood Management Project by issuing Debt Instruments or entering into financing agreements with other entities who may issue Debt Instruments, and irrevocably pledging the Gross Revenues to the repayment of such Debt Instruments;

To provide financial assistance to owners of public and private properties in areas that are likely to be flooded in order to make such property resistant to flood damage in accordance with NRS 244.3653;

To invest funds on hand in accordance with applicable law including NRS Chapter 355

Project construction, operation and maintenance

To acquire, improve, construct, equip, operate and maintain the Truckee River Flood Management Project and all Flood Management Facilities;

To be the “non-federal project sponsor” for the Truckee River Flood Management Project to solicit federal authorization and funding and enter into agreements with federal agencies for the acquisition, improvement, construction, equipping, operating and maintaining the Truckee River Flood Management Project; and

To operate and maintain the early warning system of tracking stations and sensors located throughout the Truckee Meadows and Eastern Sierra Nevada mountains and disseminate to Members and other affected entities

	<p>information that is useful in predicting, among other things, the possibility of flooding.</p>	
<p><i>Delegated Powers</i></p>	<p>To assess, collect, account for and disburse Gross Revenues as provided in Article 6;</p> <p>To cause the attachment of and enforce liens on property in connection with the fees rates and charges if authorized by statute applicable within the Member's Jurisdiction where the property lies;</p> <p>To commence and prosecute judicial or nonjudicial actions to enforce the collection of Gross Revenues and settle by compromise and settlement agreements;</p> <p>[Note: Deleted power to establish special districts]</p> <p>To borrow money and incur indebtedness or other obligations and issue Debt Instruments;</p> <p>To enter into financing agreements with issuers of Debt Instruments or other parties which may include the irrevocable pledge of Gross Revenues;</p> <p>To prepare flood control and floodplain management plans and propose regulatory measures as provided in Article 4 of this Agreement;</p> <p>To enter into contracts affecting the affairs of the Authority, including but not limited to (a) contracts with entities and individuals to provide property, goods or services to the Authority, including professional services; (b) interlocal agreements and interstate compacts authorized under NRS Chapter 277; (c) contracts with the United States of America and any of its agencies or instrumentalities; (d) contracts with any municipality, district or public agency for the operation of a common or jointly owned project or the performance of duties related to control of floods or management of floodplains; and (e) contracts of indemnity;</p> <p>To store floodwaters in surface or underground reservoirs within or without the jurisdictional boundaries of the Authority, and to save, conserve or reclaim floodwaters for present or future use of the Authority;</p>	

	<p>To cooperate with other entities or agencies in the regulation of the flow of waters through the Truckee River and its Key Tributaries;</p> <p>To sue and be sued in its own name with all of the immunities and protections afforded by law to the Members;</p> <p>To, in its own name, take by grant, purchase, gift, devise or lease, or otherwise, and to hold, use, operate, repair, maintain, enjoy and to sell, lease, or dispose of real or personal property or any interest in real or personal property of every kind within or without the boundaries of the Authority;</p> <p>To adopt and amend bylaws, resolutions and policy statements not in conflict with state and federal Constitutions and laws of Nevada for carrying on business, objects and affairs of the Authority;</p> <p>To exercise all rights and powers necessary or incidental to or implied from the specific powers granted in this Agreement;</p> <p>To cooperate with the United States, the State of Nevada, or any instrumentality, department, agency or political subdivision or municipal corporation either in the construction, maintenance and operation of the Truckee River Flood Management Project, including entering into agreements (a) to acquire and provide without cost to the operating entity the land, easements and rights of way necessary for the construction of those projects; (b) hold and save harmless the cooperating entity from any claim for damages arising from any claim for damages arising from the construction, maintenance and operation of those projects; (c) maintain and operate all works in accordance with regulations of the cooperating entity; and (d) ensure compatibility with protection levels;</p> <p>To establish and implement a program to provide financial assistance to owners of public and private property in areas that are likely to be flooded in order to make such property resistant to flood damage subject to the authority, limitations and requirements as provided in NRS 244.3653 as amended or any subsequent law</p>	
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	<p>relating to providing assistance in providing nonstructural solutions or facilities for flood control or prevention;</p> <p>[Note: Deleted power of eminent domain]</p> <p>To open and maintain bank accounts;</p> <p>To purchase and maintain insurance;</p> <p>To use the Gross Revenues and assets to indemnify and defend the Board, individual Directors, officers and employees of the Authority with respect to actions taken within the scope of their employment or authority;</p> <p>To employ persons and provide employee benefits to such employees, including retirement benefits, health benefits, vacation and leave benefits;</p> <p>To enjoy all rights of and perform all of the duties of a “local government” under NRS Chapter 354 (Local Financial Administration); and</p> <p>To perform any function provided for elsewhere in this Agreement.</p>	
<p><i>Planning and constructing Project</i></p>	<p><i>The Authority:</i></p> <ul style="list-style-type: none"> • Shall develop Facilities Plans • Shall develop annual Capital Improvement Plans which must be approved as provided in ¶3.05.B ; • Shall enter into and administer PPA with Corps; • Shall complete all reports and agreements for federal funding; • May enter into TRAction project agreements and construct TRAction facilities; • Shall acquire all property needed for project unless otherwise agreed; • As funds become available, shall plan, schedule, and enter contracts for construction of projects in accordance with PPA and the Capital Improvements Plans. • May approve additional features or designs that exceed PPA requirements if requested by a Member <p>➤ Except as specified in the PPA, Flood Management Facilities may be designed, approved and constructed by the Authority.</p>	<p>¶5.01.A ¶5.01.C ¶5.02.A §4.09. ¶5.02.B §5.04 ¶5.05.D . ¶5.03.B ¶5.03.A ¶5.05.C</p>

<p><i>Owning, operating and maintaining the Flood Management Facilities</i></p>	<ul style="list-style-type: none"> • Before soliciting bids or entering into agreements for construction, Authority shall determine who will own, operate and maintain each Flood Management Facility and enter into appropriate agreements. • Unless otherwise agreed, Authority will own all Flood Management Facilities. • Authority has exclusive control and responsibility for operation and maintenance of Flood Management Facilities. • If a Member desires to operate and maintain a Facility in its jurisdiction, Authority will enter into agreement with Member to perform operations, maintenance and repair services with funding to be provided by Authority. • Authority must prepare and keep current maintenance and monitoring plans approved by USACE and FEMA and must periodically inspect • Authority exclusive agency to respond to Corps inquiries and instructions; Members performing maintenance on Facilities agree to comply with Corps instructions. • Members reserve emergency powers to deal with Flood Management Facilities during natural disaster, including excluding all others from facility regardless of ownership. • Authority shall provide for repair and replacement of all Flood Management Facilities, establishing reserves and purchasing insurance. 	<p>¶5.05.B</p> <p>¶5.06.A</p> <p>¶5.07.A</p> <p>¶5.07.E</p> <p>¶5.07.B</p> <p>¶5.07.C</p> <p>¶5.07.D</p> <p>¶5.07.E</p> <p>¶5.07.G</p> <p>§5.08</p>
<p><i>Emergency Powers</i></p>	<ul style="list-style-type: none"> • Authority to operate Early Warning System • Authority has <ul style="list-style-type: none"> ○ emergency planning powers to make recommendations to include in emergency management plans; ○ emergency operational powers except no police power and power is subordinate to Members; ○ duty to operate flood warning system; ○ power to enter into emergency management agreements. • Authority to share early warning system data 	<p>¶5.09.A</p> <p>¶4.07.D</p> <p>§4.07</p> <p>¶5.09.C</p>
<p><i>Regulatory Powers</i></p>	<p><u>Coordinated use of police powers</u></p> <p>The Members confer certain functions and delegate on a <i>non-exclusive</i> basis the powers necessary and incidental...and agree to cooperatively plan and implement the Flood Management Facilities to regulate flood waters... to prevent loss of life and property, the disruption of</p>	<p>¶4.01.A</p>

	<p>essential public safety services, the disruption of commerce, the waste of water from floods, and to provide for improved quality of water, ecosystem restoration and enhanced recreational facilities.</p> <p>The exercise of regulatory actions taken on behalf of, or with respect to residents, businesses and any entities assessed fees by the Authority includes those taken by Members...</p> <p>To achieve these requirements, Members agree that Authority must monitor proposed land use changes and development and construction in the project area to endeavor to ensure that they do not change drainage patterns, or increase the quantity, timing and duration of flows in a manner that adversely affects the Flood Management Facilities built or to be built</p>	<p>¶4.02.A</p>
	<p><u>Flood Management Facilities Planning</u></p> <ul style="list-style-type: none"> • Authority to design and schedule construction of Flood Management Facilities to control floodwaters through the Reno-Sparks area to be naturally dissipated downstream. 	<p>§4.05.A</p>
	<p><u>Regulatory Codes and Planning.</u></p> <ul style="list-style-type: none"> • Authority shall from time to time propose floodplain management and flood control plans and regulations for inclusion in Development Codes of Members (“Amendments”) to protect the Flood Management Facilities, to mitigate the adverse impact that new development may have on flooding and on the level of protection the facilities are designed to provide and to ensure compliance with the PPA. The Amendments will be drafted with the planning staffs of Members and once the staffs agree on the wording will be promptly be presented to planning commissions/governing bodies for consideration in their sole legislative discretion. Members agree to act on the proposed Amendments within six months after proposed. If a Member does not approve the proposed Amendments, the Board will consider what was approved and may take appropriate action to protect Flood Management Facilities and prevent breach of the PPA. • Authority shall (in cooperation with Member planning staffs) submit floodplain management and flood control 	<p>¶4.02.B</p> <p>§4.06</p>

	<p>plans to the Northern Nevada Water Planning Commission for inclusion in the Comprehensive Plan ; recommendations must be in unison with Member master plans;</p> <ul style="list-style-type: none"> • Members agree to request that a representative of the Authority be appointed to be a voting member of the Northern Nevada Water Planning Commission. • Authority shall propose to the Regional Planning Commission information required by NRS 278.0274 (2) and NRS 278.0274 (5) regarding floodplain management or Flood Management Facilities to be included in regional master plans. • If a Member appears before Regional Planning Commission with respect to (i) adoption or amendment of the Regional Plan, (ii) the guidelines and procedures for review of a project of regional significance, or (iii) amendments to the Member’s Master Plan [Note: eliminated from the list was conformance reviews and the review of projects of regional significance], Member staff shall include any written comments submitted by Executive Director, but the Member staff is not obligated to agree with or recommend approval of the Executive Director’s comments. • Executive Director may appear before Regional Planning Commission or Governing Board without approval by the Board, but must obtain approval of the Board before seeking judicial review of any decision of the Regional Planning Commission or Governing Board 	<p>¶4.06.D</p> <p>§4.07</p> <p>¶4.07.B</p> <p>¶4.07.C</p>
	<p><u>Review of Master Plan Amendments and Project Applications</u></p> <ul style="list-style-type: none"> • Proposed amendments to local Development Codes shall include that the following matters will be referred to the Authority as indicated. Fees, rates and charges will not be imposed by the Authority until these referral Amendments are adopted. • To be referred to the Authority for <i>review and comment</i>: <ul style="list-style-type: none"> (i) All Master Plan updates and amendments initiated by a Member 	<p>¶4.02.B.2</p> <p>¶4.02.B.5</p> <p>¶4.02.B.2. a</p>

	<p>(ii) Applications for approval or amendments to special use permits and planned developments if the development or project in question (a) would ultimately discharge or drain water into the Truckee River or a Key Tributary (except for projects or developments that drain into Lake Tahoe); <i>and</i> (b) it is reasonably believed that there would be a change of the hydrologic response of the project site.</p> <p>(iii) Applications for approval or amendment of tentative maps if the development or project in question would ultimately discharge or drain water into the Truckee River or a Key Tributary (except for projects or developments that drain into Lake Tahoe), except that applications for tentative maps need not be sent to the Authority for review and comment if the development or project in question has already been submitted and reviewed as a planned development under subparagraph 4.02.B.2.a (ii) and during such review, the Authority has not reserved the right to review and comment on tentative maps as they are developed.</p> <p>(iv) Applications for grading permits where the grading is a part of an overall development or project that (a) has not already been reviewed by the Authority as a part of a planned development, special use permit, or tentative map; (b) would drain into the Truckee River or a Key Tributary; <i>and</i> (c) exceeds the area or other criteria established by regulation of the Authority.</p> <p>(v) Other applications established by Authority regulations approved as provided in Paragraph 3.05.B of this Agreement.</p> <ul style="list-style-type: none"> • The following matters shall be referred to the Authority <i>for information only</i>. <ul style="list-style-type: none"> (i) Master Plan amendments initiated by land owners, (ii) zoning amendments; (iii) tentative maps and special use permits not submitted for review and comment as specified in ¶4.02.B.2.a above, and parcel maps 	<p>¶4.02.B.2. b</p>
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	<ul style="list-style-type: none"> Final maps, variances and building permits will <i>not be referred to the Authority</i> at all: <ul style="list-style-type: none"> A separate permit or approval shall not be required from the Board. <p>[Note: Previous summary tables and original draft of Agreement provided that all land use changes in Master Plan and that “certain” projects would be referred to Authority.</p> <p><u>With respect to matters submitted to Authority for review and comment:</u></p> <ul style="list-style-type: none"> Authority staff shall review such items to ensure the activities will not have an adverse impact on the Flood Management Facilities or the functioning of the Truckee River Flood Management Project and advise Member staffs of their findings. Authority must respond within the deadlines established by the Member, or the matter will be submitted to planning commission without comments; If Authority fails to file written comments on time and fails to appear at hearing, Authority waives rights of appeal and judicial review. Member staffs shall submit all written comments timely submitted but are not obligated to agree with or recommend approval of those comments and may make their own comments in their professional discretion. 	<p>¶4.02.B.2 c</p> <p>¶4.02.C.1</p> <p>¶4.02.C.1</p> <p>¶4.02.B.3</p> <p>¶4.02.B.3</p> <p>¶4.02.C.1</p>
	<p><u>Flood Impact Models and Analysis.</u></p> <ul style="list-style-type: none"> Authority may acquire, operate and maintain one or more hydraulic, hydrological or other types of models or tools to determine conveyance capacities of the Flood Management Facilities and to assist in estimating the possible effects of the development of land or other events or circumstances on flooding, flood control plans, floodplain management plans, or the Flood Management Facilities. 	<p>¶4.02.C.3</p>

	<ul style="list-style-type: none"> • An Interagency Hydrologic Model Team with equal representation from each Member shall be appointed to advise the Executive Director on the design, operation, maintenance, use and results of all hydrological models. The committee is not a public body subject to open meeting law. 	¶4.02.D
	<p><u>Regulations of Authority:</u> Authority may enact regulations:</p> <ul style="list-style-type: none"> • setting standards and procedures for Authority staff to follow in making determinations and recommendations regarding future land use and development • regarding internal operating procedures and the use, operation, and maintenance of property of the Authority, • regulations must be approved by 75% of all members of the Board. 	<p>¶4.02.C.2</p> <p>§4.04</p> <p>¶3.05.B</p>
PROJECT FINANCING		
<i>Ratemaking Powers</i>	<ul style="list-style-type: none"> • Subject to provisions regarding withdrawal of a Member, and dissolution of Authority, Members irrevocably delegate to Authority the powers they have under SB 175 to impose and collect rates and fees to generate revenues to pay for acquisition, operation and maintenance of Flood Project. Rate resolution of Authority must provide for fee adjustment mechanisms and relief in extreme hardships. Rates and fees must be uniform between Member jurisdictions. Judicial confirmation required. • Each Member agrees not to repeal, amend or otherwise directly or indirectly impair outstanding Debt Instruments or other obligations of Authority... 	<p>§6.01</p> <p>¶6.01.A.1</p> <p>¶6.01.A.3</p> <p>¶6.01.A.4</p>
<i>Infrastructure Tax Plan powers</i>	<ul style="list-style-type: none"> • Reserving statutory powers and responsibilities to collect and administer the Infrastructure Tax (1/8 % sales tax), County irrevocably pledges and agrees to pay to Authority the Infrastructure Fund Flood Project Net Revenues (funds available after honoring all pledges and paying debt service and reserves on existing obligations of County). • County delegates to Authority the power to change the Infrastructure Tax Plan with respect to flood project. • If County believes Authority is violating the law with respect to delegated powers, it may bring lawsuit. 	<p>¶6.02.A</p> <p>¶6.02.B</p> <p>¶6.02.D</p> <p>¶6.02.C</p> <p>¶6.02.E</p>
<i>Other Revenue</i>	<ul style="list-style-type: none"> • Authority has powers to accept loans and grants, cost 	¶6.03.A

<i>Powers</i>	sharing arrangements.	
<i>Special Districts</i>	<ul style="list-style-type: none"> • [Note: Authority to establish Special Districts was deleted from agreement]. . 	
<i>Expenditure of Project Revenues and Financing Flood Facilities</i>	<ul style="list-style-type: none"> • Authority may use and pledge Gross Revenues only for the Truckee River Flood Management Project. 	§6.04
	<ul style="list-style-type: none"> • Authority can borrow money and issue Debt Instruments (bonds etc) or enter into financing agreements with others who will issue Debt Instruments. 	§6.05
<i>Floodproofing Financial Assistance</i>	<ul style="list-style-type: none"> • Washoe County delegates power to provide financial assistance to owners of public and private properties in areas that are likely to be flooded in order to make such property resistant to flood damage in accordance with Section 3 of AB 54. 	¶3.02.A.vii ¶3.02.B.xv
<i>Required Debt Coverage and Reserves</i>	<ul style="list-style-type: none"> • Authority must maintain fees rates and charges sufficient to meet all operational expenses and meet a 120% Debt coverage. 	¶6.06.B.1
	<ul style="list-style-type: none"> • Authority must limit debt so that Gross Revenues over the ensuing five years would cover debt payments by 120% 	¶6.06.B.2
	<ul style="list-style-type: none"> • Authority must maintain a Reserve for Replacement fund equal to 10% of the replacement cost of uninsured capital structures. Reserve may be built up over five years. 	
	<ul style="list-style-type: none"> • Authority must establish and maintain an operating reserve of 25% of each year’s operating budget to cover unexpected increases in operating costs and decreases in revenues. Three year build-up. 	¶6.06.C.1
	<ul style="list-style-type: none"> • After initially established, if operating or replacement reserves fall below the required amount, Authority shall have three years to bring them up. 	¶6.06.C.1
<i>Impairment of Debt Instruments or Gross Revenues</i>	<ul style="list-style-type: none"> • If collection of Gross Revenues or issuance or repayment of a Debt Instrument is invalidated or impaired because of a provision in the Cooperative Agreement, Members shall amend the Agreement to correct. 	¶6.07.A
	<ul style="list-style-type: none"> • If action or inaction by a Member impairs or leads to the invalidation of the imposition of Gross Revenues or the issuance or repayment of a Debt Instrument, the Member agrees to take corrective action or assume the liability under any Debt Instrument to the extent the impairment is caused by the uncorrected action or inaction. . 	¶6.07.B

RIGHTS AND OBLIGATIONS OF MEMBERS		
<i>Insurance and Indemnifications</i>	<ul style="list-style-type: none"> • Authority must maintain insurance, and must name Members as additional insureds on general liability policies. 	§7.01
	<ul style="list-style-type: none"> • Members will indemnify, hold harmless and defend Authority from liability arising out of acts, errors and omissions of Members. 	§7.02
	<ul style="list-style-type: none"> • Authority will indemnify, hold harmless and defend Members from liability arising out of location, design, construction, condition, failure, and use of Facilities; errors and omissions of Authority; and “takings” liability. 	§7.02
<i>Washoe County</i>	<ul style="list-style-type: none"> • County to convey property, contracts, funds, Books records and documents acquired for the flood project within 90 days. 	§8.01
	<ul style="list-style-type: none"> • Unless otherwise agreed, existing and new employees of Authority shall be employees of County subject to all ordinances, regulations, rules, policies and collective bargaining agreements and benefits. 	§8.02
	<ul style="list-style-type: none"> • Authority agrees to reimburse County for all costs plus up to 5% administrative fee. 	§8.02
<i>City of Reno</i>	<ul style="list-style-type: none"> • Reno to convey property needed for flood project. 	§9.01
	<ul style="list-style-type: none"> • TRAction and other contracts Reno has with County relating to the Truckee River Flood Management Project transferred over to Authority. 	§9.02
<i>City of Sparks</i>	<ul style="list-style-type: none"> • Sparks to convey property needed for flood project. 	§10.01
	<ul style="list-style-type: none"> • TRAction and other contracts Sparks has with County relating to the Truckee River Flood Management Project transferred over to Authority. 	§10.02
	<ul style="list-style-type: none"> • Sparks agrees to rescind its Flood Protection Rates upon certain events (still under negotiation). 	
	<ul style="list-style-type: none"> • Sparks and Authority agree that Authority will take over the construction, operation, and maintenance of the North Truckee River Drain Project subject to terms and conditions still under negotiation. 	
GENERAL TERMS		
<i>Term and Termination of Agreement</i>	<ul style="list-style-type: none"> • Agreement Commences when executed by all parties (Authority executes when it has been duly organized) and approved by Attorney General, and is perpetual until terminated. 	§11.01
	<ul style="list-style-type: none"> • Agreement may be partially or completely terminated by agreement of the parties. Authority must be dissolved on complete termination of Agreement. 	§11.02
<i>Other Terms and Provisions</i>	Provisions regarding default and remedies [§12.03], waivers [§12.04], representations and warranties of the parties	

	[§12.05], general covenants of the parties [§12.06], assignment and delegation [§12.07], binding effect, no third party beneficiaries [§12.08], standards for approval [§12.09], notices [§12.10], further acts and assurances [§12.11], attorneys fees and costs [§12.12], timing provisions [§12.13], applicable law [§12.14], non-liability of officers and employees of parties [§12.15], severability of invalid provisions [§12.16], construction of Agreement [§12.17], modifications and amendments [§12.18], authority to execute [§12.19] and entire agreement with counterpart signatures [§12.20]	
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FLOOD PROJECT COORDINATING COMMITTEE STAFF REPORT

MEETING DATE: October 8, 2010

DATE: September 29, 2010
TO: Flood Project Coordinating Committee Members
FROM: Naomi Duerr, Director, Truckee River Flood Management Project,
850-7420, nduerr@washoecounty.us
SUBJECT: AMENDMENT TO THE FLOOD FUNDING STUDY CONTRACT WITH FCS

SUMMARY

Over the past two and a half years the Truckee River Flood Project staff and representatives from the Cities of Reno and Sparks and Washoe County have been working with FCS Group to support the development of a detailed study of flood funding area options to identify how “flood funding areas” could be set up to help fund the flood project, and to perform a regional cost benefit analysis to demonstrate the benefits of the flood project to the community and to Congress.

The staff group has met multiple times over the last eighteen months to review and guide the consultants, as well as spent a great deal of time defining the type of governance that would best suit the new organization. As staff and the Finance Subcommittee worked through the various issues, contract tasks were expanded and new tasks were added to the contract consuming the bulk of the original contract amount. At this point, we need to add additional dollars to the agreement to initiate Phase II of the study, as well as to update some of the original economic and financial assumptions from eighteen months ago. This item requests the approval of additional funding for the FCS Group contract, in an amount not-to-exceed \$150,000 to complete the Flood Funding Area Study. The additional funds will be paid from the flood project’s dedicated 1/8 cent sales tax.

PREVIOUS ACTIONS AND ACTIVITIES

FPCC Meeting 8-18-06: Presentation on funding options and a scope of work for a benefits engineering study. This included discussion on potential maps for a special assessment district including the areas that flooded in 1997 and a map showing the hydrographic basins that drain into the Truckee River that could be included in a funding district based on their contribution of runoff to the Truckee River.

FPCC Meeting 11-17-06: Presentation of potential funding options including a special assessment district and a funding district based on hydrographic basins that drain into the Truckee River.

FPCC Meeting 12-8-06: Presentation of potential funding district boundaries and hiring of a benefit engineer. FPCC direction to staff to hold workshops with local elected officials in December 2006.

FPCC Meeting 11-9-07: Update on RFQ for Flood Funding Area consultant.

FPCC Meeting 1-11-08: Update on the selection of the successful firm to complete the Flood Funding Area study to be forwarded to the BCC for approval on January 22, 2008.

BCC Meeting 1-22-08: Washoe County Board of County Commissioners approve contract award to FCS Group in association with CH2MHill.

Finance Subcommittee Meeting 4-7-08: First briefing by FCS Group

Finance Subcommittee Meeting 5-6-08: Second briefing by FCS Group

Finance Subcommittee Meeting 6-10-08: Third briefing by FCS Group

Finance Subcommittee Meeting 8-6-08: Fourth briefing by FCS Group

Finance Subcommittee Meeting 9-9-08: Fifth briefing by staff

Nevada Legislature February 2009 – May 2009: Multiple presentations regarding SB 175 to various legislative subcommittees.

BACKGROUND

Over the last two and a half years the Flood Project Coordinating Committee (FPCC), the flood project staff and a team of staff members from the two cities and the county have been working through the various tasks associated with the completion of the Flood Funding Areas Study approved by the BCC in January 2008. The original timeline was expanded to allow staff and the Finance Subcommittee to work through the details of the study and taking the necessary time to review significant issues with the staff oversight group.

The contract was put on hold for 6 months during the first half of 2009 while the FPCC worked on the passage of SB 175 in the Nevada Legislature. The FPCC spent significant time identifying the type of governance that would be best suited for this type of organization and the pros and cons of each of the various governance models. After settling on the appropriate governance form, staff and managers are now finalizing the agreement that will allow us to form the Joint Powers Authority.

The consultants have been working on a parallel track completing tasks assigned to them during the existing contract. As we have moved worked through the original tasks identified in the January 2008 contract several areas have been identified that will necessitate additional work and funding to complete. The contract amendment will include analytical activities and consultative services by the Consultant team to update the revenue requirements and rate forecasts that support implementation of a uniform regional rate.

The following list is the key areas identified to be completed with the additional funds:

- Refine flood project funding boundaries
- Refine flood project rate basis assumptions
- Update construction employment impact assumptions
- Update economic benefits assumptions
- Prepare new rate model with updated assumptions
- Analyze potential rates for a smaller (50-year protection?) project
- Complete financial analysis of revenue stream and resulting funding that could be available.
- Support team through the judicial determination process

Phase II of the project will result in the issuance of a draft and final report as well as several presentations before the FPCC and other groups as needed.

FISCAL IMPACT

The not-to-exceed cost of \$250,000 for the agreement with FCS Group would be provided by the Flood Project's dedicated 1/8 cent sales tax fund. There are sufficient funds in Truckee River Flood Management Project Fund Professional Services account (211-211001-710100) to fund the project. The project will be managed on a task deliverable basis (time and materials).

RECOMMENDATION

It is recommended that the FPCC approve the amendment to the FCS Flood Funding Contract in an amount not-to-exceed \$250,000.

POSSIBLE MOTION

Motion to approve the staff recommendation.

LG:nsd

Agenda Item 5C

Attachment 2

Phase 2: FCS Group Work Scope

Phase 2 work activities include analytical and consultative services by the Consultant team for updating the revenue requirements and rate forecasts that support implementation of a uniform regional rate. The work activities, subject to the direction of the Washoe County Flood Project Staff (Staff) and the Flood Project Coordinating Committee (FPCC), include:

2.1 Refine Flood Project Funding Boundary: Task includes revising and/or updating the Phase 1 Flood Funding Study assumptions regarding the flood project benefit areas (geography) which will serve as the geographic basis for allocating the revenue requirements by land use/property type. GIS base maps of the flood project benefit areas will be prepared by the consultant for selected portions of Washoe County (will exclude Storey County and Native American Tribe lands). *(Cost estimate per attachment A \$11,703)*

2.2 Refine Flood Project Rate Basis Assumptions: Task includes obtaining most current assumptions from the Washoe County Assessor regarding land use/property types within the Flood Project Funding Boundary (Benefit Area) that will be subjected to the new Flood Project Rate (FPR). Washoe County Flood Project Staff will work with the Consultant and the Washoe County Assessor to obtain and compile the assessor records in MS Excel format. Consultant will sort these records by land use/property code in a manner that can serve as a basis for rate making. Property types will be separated and grouped according to rate classifications (e.g., single family residential, commercial, industrial, federal, etc.) to allow for a sensitivity analysis of rate structure alternatives that can include or exclude selected property types from the new FPR. *(Cost estimate per attachment A \$17,403)*

2.3 Update Construction Employment Impact Assumptions: Consultant will work with Staff to discuss assumptions that will be used to estimate the economic analysis of the Flood Project. The economic analysis will utilize current IMPLAN model estimates using variable input assumptions provided by the Staff for the expected level of capital expenditures by IMPLAN economic sector. Results of this analysis will be described by the Consultant with supporting details regarding total and average annual direct, indirect and induced benefits in terms of employment, wages, business income, business taxes, value added and overall economic output. *(Cost estimate per attachment A \$6,220)*

2.4 Update Ecosystem and Recreation Benefits Assumptions: Flood Project Staff will provide Consultant with relevant study findings from an independent analysis of Ecosystem and Recreation Benefits that is being conducted by UNR research staff. The findings will be discussed among UNR, Staff and the Consultant to confirm key

assumptions for potential inclusion in the flood funding rate structure (s) or FPR. *(Cost estimate per attachment A \$2,183)*

2.5 Update Economic Benefits Assumptions: Flood Project staff will provide Consultant with relevant study findings from the latest USACE flood modeling of flood frequencies and duration forecasts, and expected property damage avoidance assumptions (expected in mid-October). This work will be discussed among Staff, Consultant and USACE representatives. If revisions are made to the flood inundation area boundaries for properties within the current 50-, 100- and 117-year flood zones, the latest GIS data will be provided to the Consultant by Staff and included in the FPR structure analysis. The forecast of property damage avoidance will take into account the current USACE assumptions and the Consultant will make adjustments to the property damage avoidance assumptions provided in Phase 1 using factors that represent relative changes in Flood Project benefits based on current flood frequency and event duration levels. Additionally, consultant will analyze and recalculate rates for a \$525 million~50 year) Flood Project Option (FPO). The overall economic benefits of property damage avoidance, insurance premium reductions, reduced business impacts and ecosystem and recreation benefits will be discussed and updated based on results from the Phase 1 study and most current assumptions for the Phase 2 study. A revised allocation of revenue requirements will be made for residential and non-residential customer types using current economic benefits assumptions. *Note: to the extent that updated USACE flood and economic benefit data is not provided or available to the Consultant these results will rely on the most current local and regional economic benefits analysis assumptions for the allocation of the revenue requirements by customer. (Cost estimate per attachment A \$16,560)*

2.6 Prepare New Rate Model: Based on the results of Phase 1 and the earlier Phase 2 work tasks, the Consultant will prepare three (3) (rate forecast scenarios (start high, start low, flat rate) for developing a uniform regional rate. Rate forecasting model(s) will be provided in *MSExcel* using current assumptions as inputs, with integrated calculations that forecast revenue requirements by jurisdiction, and include uniform regional rate forecasts for residential and non-residential customers. The new rate model will include a sensitivity analysis that depicts the impacts of rate caps, rate basis options (i.e., are federal and tribal properties included), local cost share, reserve requirements, rate structure, and other input variables. The updated rate forecasts will be summarized in a technical memorandum with supporting *MSExcel* spreadsheet models. *(Cost estimate per attachment A \$15,883)*

2.7 Financial Analysis: The financial analysis will help determine that amount of credit financing (most likely tax-backed revenue bonding), that could be supported by expected rate revenues and other dedicated funding sources that could be pledged to the debt payments, and the expected amounts of funding that could be available for construction over a 30-year time frame. The Consultant will work with the Staff and their appointed bond counsel to discuss and analyze preliminary assumptions for

Flood Project bond financing scenarios. The financing will necessarily need to accommodate central County versus separate agency borrowing approaches which may include different credit arrangement assumptions to reflect credit market differences. The Consultant will prepare a 30-year financial cash flow model that takes into account forecasted revenue streams from dedicated funding sources for the Flood Project, and includes variable assumptions regarding capacity to secure revenue bonds with taxing capacity, bond premium amounts, issuance costs, interest rates, reserve requirements, coverage ratios and discount rates. The Consultant will summarize the results of this work in a Technical Memorandum that describes relative assumptions, variable inputs and preliminary findings. (*Cost estimate per attachment A \$14,363*)

2.8 Rate Model Training Workshop: This task will result in a revised “stand alone” separate handbook that is intended to assist Rate Model users with a reference for understanding, updating, and interpreting the rate model. The revised handbook narrative will include feedback received from the client on the Draft Rate Model Handbook provided in Phase 1. The handbook will describe key input variables, model logic flow, data links, and key metrics for understanding the results. The Consultant will update and document each of the variables and rate structure alternatives and provide an overall explanation of how the model works (input variables, outputs, user interface) and “protected cells” to help mitigate user interface errors from linked spreadsheet calculations. The Consultant will conduct a half-day workshop in Washoe County with Flood Project Staff and other local agency staff to orient users with the rate model and to go over the handbook, and to provide hands on training in an interactive workshop setting. (*Cost estimate per attachment A \$9,943*)

2.9 Issue Draft and Final Report: This task includes written documentation of the Flood Project Funding Study Phase 2 results in the form of a summary level report with technical appendices of all work task deliverables. The draft report will include the results of Tasks 2.1 through 2.8. Based on the client’s review of the draft report, the Consultant will discuss potential revisions and make appropriate edits, then issue a final report of Phase 2 findings. The Consultant will provide an electronic copy of the results in PDF format. (*Cost estimate per attachment A \$17,665*)

2.10 Phase 2 Presentation: This task includes preparation of one (1) *MSPowerpoint* presentation, and Consultant attendance at a Flood Project Coordination Committee or Finance Subcommittee meeting to present Phase 2 results. Representatives from the Consultant team will be present at this meeting. Additional meetings can be accommodated on a time and expense basis as increments to the budget if requested (*Cost estimate per attachment A \$16,550*)**2.11 Project Management:** Task includes monthly telephone discussions between the Consultant Project Manager and the Flood Project Study Director and her team. The purpose of these monthly discussions is to review work progress, and to discuss any outstanding study issues.

Consultant team members will also participate in up to four (4) meetings with the Flood Project Coordinating Committee or Finance Subcommittee, one (1) Rate Handbook Workshop, and up to two (2) public hearings or presentations. It is expected that meetings will be attended in person by one or more Consultant team members. (*Cost estimate per attachment A \$19,470*)

Project Schedule:

The project schedule for completing Phase 2 assumes work is initiated by October 15 and completed by June 30, 2011. The schedule is contingent on the receipt of independent study results and key project assumptions and review of interim deliverables in a timely manner. The cost estimate to complete the proposed work scope for Phase 2 is estimated to be \$149,940, as detailed in **Attachment A**.

We are continuing to work with the consultant's on some potential schedule changes that will be discussed at the October 8, 2010 FPCC meeting that may impact the cost of phase II. We do not estimate that the schedule changes will have a significant impact on the cost but we will present the potential impacts to the FPCC at the October meeting.

Attachment A

Estimated Budget													
Phase/Task	FCS GROUP				CH2M-Hill			Estimated Budget					
	Sr. Project	Sr. Project	Admin.		Admin	GIS		Total	Total				
	Principal	Manager	Consultant	Support	Principal	Support	Support	Hours	Budget				
<i>Hourly Billing Rates:</i>													
<i>Findlay</i>													
	\$210	\$190	\$150	\$70	\$210	\$85	\$175						
Phase 2													
2.1	Refine Flood Project Funding Boundary				4	16	8	2	4	0.5	32	66.5	\$11,703
2.2	Refine Rate Basis Assumptions				4	40	24	4	4	0.5	24	100.5	\$17,403
2.3	Update Const. Job Impact Assumptions				0	32	0	2	0	0	0	34	\$6,220
2.4	EcoSystem & Recreation Benefit Assumptions				2	6	2	1	1	0.5	0	12.5	\$2,183
2.5	Update Economic Benefits Assumptions				4	56	32	4	0	0	0	96	\$16,560
2.6	Prepare New Rate Model				8	40	40	2	2	0.5	0	92.5	\$15,883
2.7	Financial Analysis				8	32	40	2	2	0.5	0	84.5	\$14,363
2.8	Rate Model Handbook Training Workshop				4	8	40	4	6	0.5	0	62.5	\$9,943
2.9	Issue Draft & Final Report				8	40	32	32	6	1	0	119	\$17,665
2.10	Phase 2 Presentation				16	40	24	2	8	2	0	92	\$16,550
2.11	Project Management/client coord.				16	56	12	2	16	2	0	104	\$19,470
<i>Subtotal Phase 2 Labor</i>													
	74	366	254	57	49	8	56	864	\$147,940				
<i>Estimated Phase 2 Direct Expenses*</i>													
									\$2,000				
Total Phase 2 Budget													
									\$149,940				

* Direct expenses for travel and per diem, assuming 4-person trips with 2 days per trip.



Civil Engineers
Surveyors
Water Resources Engineers
Water & Wastewater Engineers
Construction Managers
Environmental Scientists
Landscape Architects
Planners

September 8, 2010

Ms. Naomi S. Duerr, PG
Director
Truckee River Flood Project
9390 Gateway Drive, Suite 230
Reno, NV 89521

RE: Truckee River Watershed Regional Hydrologic Model - Phase 2

Dear Ms. Duerr:

Manhard Consulting, Ltd. (Manhard) would like to thank you for the opportunity to submit this Scope of Services, Schedule of Time and Material Rates, Detailed Cost Estimate, and Project Schedule for Phase 2 of the Truckee River Watershed Regional Hydrologic Model contract for the Truckee River Flood Management Project (TRFMP). The objective of the Phase 2 Scope of Services is to develop a planning level regional hydrologic model for the Truckee River watershed that can assist in the evaluations of impacts to stormwater flow, volume, and timing due to development, land use changes, and flood mitigation measures in the watershed. The model will provide useful information to policy makers when evaluating impacts to determine if policy or codes require updates for public safety. Additionally, detailed model development documentation, model upkeep/maintenance, and model-use training will be provided.

BACKGROUND

The Truckee River watershed is comprised of the entire Lake Tahoe basin, the Truckee River, and the Pyramid Lake Systems and covers an area of approximately 2,720 square miles. For the purposes of this study, a planning level model will be developed for the area extending from the outlet of Lake Tahoe, in California, and all the contributing area up to the Vista Narrows, in Nevada. This area also includes the Washoe Lake watershed as it contributes flow to the Truckee River segment under consideration via Steamboat Creek. The total study area is approximately 922 square miles.

The TRFMP seeks a hydrologic model that can be used to evaluate impacts of both large (>100 acres) and small (~5 acres) scale developments, accounts for both surface and subsurface flows, is scalable, has robust open and closed system routing capabilities, and is easily editable for incorporating model changes. The U.S. Army Corps of Engineers' (USACE) Gridded Surface Subsurface Hydrologic Analysis software package (GSSHA) was selected as most suited for the TRFMP's needs and will be used to develop the Truckee River Watershed Regional Hydrologic Model (TRFMP Model), based on the results

from Phase 1 (Sun Valley Watershed Pilot Study/Model Evaluation) of the Truckee River Watershed Regional Hydrologic Model contract.

Manhard proposes to perform the Phase 2 work as detailed in the attached Exhibit A - Scope of Services on a Time and Materials Not-to-Exceed basis for \$830,770.00. Also attached are Exhibits B, C, and D that contain Manhard's Schedule of Time and Materials Rates for 2010, Detailed Cost Estimate, and Project Schedule, respectively. The Project Schedule (Exhibit D) mirrors the Scope of Services and Detailed Cost Estimate, and outlines our plan for delivering the work associated with Phase 2 of the Truckee River Watershed Regional Hydrologic Model contract.

Thank you again for the opportunity to serve the TRFMP. Should you have any questions, please do not hesitate to contact us.

Yours truly,

MANHARD CONSULTING, LTD.



Jeff House, CFM
National Director of Water Resources
Vice-President

ACCEPTED: TRUCKEE RIVER FLOOD MANAGEMENT PROJECT

By: _____
(Authorized Representative)

Title: _____

Date: _____

EXHIBIT A - SCOPE OF SERVICES

TASK AUTHORIZATION SCHEDULE: To achieve the most efficient project Task execution, some of the Tasks outlined in this Scope of Services, need to be performed simultaneously. To achieve efficient data collection and GIS layer development, it is necessary for Tasks 1 and 2 to begin at the same time upon Notice to Proceed. At the culmination of Task 1 on November 25, 2010, Manhard will produce a Task Completion memo and Authorization to Proceed request for the TRFMP for Tasks 3, 4, and 6 simultaneously. Therefore, Task 2 will be well under way when Tasks 3, 4, and 6 begin. When Tasks 3 and 4 are complete, Task 5 can begin. When Task 5 is complete, Tasks 7 and 8 can begin. Tasks 9 and 10 are ongoing throughout the project from beginning to end. This Task authorization schedule is detailed at the end of each Task section contained herein. A detailed timeline for all Tasks is provided in Exhibit D – Project Schedule.

TASK 1. DATA COLLECTION AND COMPILATION

Introduction: Data will be collected and compiled for the purpose of setting up GSSHA model inputs. Manhard will compile, review, and update (as necessary) data already obtained and/or developed for previous hydrologic studies in the region. Data includes:

- Physiographic data - topography, land use, vegetation, soils, stream corridors, surface flow paths and patterns; and
- Stormwater management data – roadways, drainage and flood control facilities, and irrigation ditches.

1.1 Data for Model Setup: Topographic data will be developed using a combination of Washoe County's 2004, 2006, and 2007 Digital Terrain Models (DTM) and the USGS 1/3 arc-second (10 meter) National Elevation Dataset (NED). A 30-meter Digital Elevation Model (DEM) will be created for the entire Truckee River watershed by merging the best available elevation data sources.

Land Use data has been developed for a large portion of the study area using Washoe County (County) parcel data and aerial photography. Land Use layers will be developed for each of the historical precipitation events and the initial conditions used for the Truckee River Flood Project design. Stream centerlines will be developed using available County GIS data and supplemented with digitizing stream channels from aerial photography and field investigation. Channel dimensions will be field measured where channel survey data is not available.

Data for existing regionally significant stormwater management facilities will be obtained from available County GIS, previous studies, and field surveys. Regionally significant facilities include large-scale municipal facilities deemed critical to the control of stormwater and flooding, such as: bridges, detention basins, channels, and large diameter storm drains and culverts. Stage-storage-discharge curves and performance rating curves will be developed for each Regionally Significant flood control facility using available data and field surveys, as necessary.

1.2 Data for Model Calibration and Validation: Precipitation data will be compiled and transformed into GSSHA input files for use in calibrating parameters utilized by GSSHA. Gage adjusted NEXRAD event data and corresponding streamflow data from the January 1997, New Years Eve 2005, and January 2008 storm events will be utilized in the model calibration and validation. Research for additional streamflow data will be conducted to supplement existing data within areas not included in previous studies.

1.3 Overland Flow Testing and Troubleshooting: Rainfall excess in each grid cell is converted to stormwater runoff and conveyed from cell to cell by means of 2-D overland flow. These flow paths will be evaluated for accurate locations within the grid cell and connectivity between cells. Depression areas created by the surface DEM will need to be edited to provide a positive flow direction for every grid cell. The depression areas are created by roadway/dam embankments and areas where small drainage swales are not accurately depicted in the DEM.

Task 1 Due Date: November 25, 2010

At the culmination of this task, Manhard will produce a Task Completion memo and Authorization to Proceed request for the TRFMP on Tasks 3, 4, and 6 simultaneously.

Task 1 Interim Deliverables:

Digital ESRI personal geodatabase containing all interim GIS layers and tables collected in this task. The geodatabase is expected to include:

- ◆ Washoe County 2-foot topography
- ◆ Washoe County 1-foot topography
- ◆ USGS DEM (10-meter resolution) – for areas outside of Washoe County
- ◆ Washoe County GIS parcel layer with land use code
- ◆ Land use digitized from aerial photography – outside of Washoe County
- ◆ Roadway centerlines
- ◆ Stream centerlines
- ◆ Irrigation ditches
- ◆ Available stormwater drainage features

Task 1 Final Deliverables:

Digital ESRI personal geodatabase containing all final GIS layers and tables collected in this task. The geodatabase is expected to include:

- ◆ Final existing conditions land use layer – entire watershed
- ◆ Final future conditions land use layer – entire watershed
- ◆ Final 1997 conditions land use layer – entire watershed
- ◆ Final 2005 conditions land use layer – entire watershed
- ◆ Final 2008 conditions land use layer – entire watershed
- ◆ NRCS soils mapping (SSURGO) – entire watershed
- ◆ Stream centerlines (field verified)
- ◆ Regionally significant stormwater drainage features
- ◆ Final 30-meter DEM of Nevada portion of Truckee River Watershed
- ◆ Final 100-meter DEM of California portion of Truckee River watershed
- ◆ Digital Gage-Adjusted Radar Rainfall data (GIS layer and text files);
- ◆ Digital precipitation and stream gage data; and
- ◆ Excel Spreadsheet with calculations of Stage-Storage-Discharge tables for each storage routing.

Task 1 Fee Estimate: \$174,311

TASK 2. SOIL MAPPING AND FIELD TESTING

Introduction: The Manhard-DRI team, as well as other hydrology professionals in the region, has identified soils data as an area that is in need of significant improvement to more accurately estimate infiltration within the Truckee River watershed. This is a common need across the United States as the

current standard for soils data is based on USDA Soil Survey Maps that were developed between the 1930's and the 1970's using aerial imagery and limited field observation and testing. The results of this task will be an updated soils map with approximately 12 soil groups and a range of values for infiltration parameters for each soil group. These values will be based on field testing in the Nevada portion of the Truckee River watershed. For this task, the Desert Research Institute (DRI) will conduct infiltration experiments within the Nevada portion of the Truckee River watershed at selected locations.

The regional hydrologic model will use the Green & Ampt method, a physically-based infiltration approach, to estimate infiltration of rainfall into the soil. The excess rainfall that does not infiltrate into the ground is considered stormwater runoff. The Green & Ampt method requires several soil hydraulic parameters, including: saturated hydraulic conductivity, wetting front suction head, and initial soil moisture content. All of these parameters are related to physical, measurable properties of soil.

The estimation of these parameters occurs in three steps. First, the soils within the study area are classified into soil texture classes or groups (e.g. sand, loamy-sand, loam, silt, silty-loam, clay, etc.). Second, the Green & Ampt parameters are estimated for each soil texture class using field testing. Third, site-specific infiltration parameters are generalized to apply to soil groups.

2.1 Soils Mapping and Site Selections: The USDA SSURGO soils mapping data collected in Task 1 will be used as a base soils map and will be improved with additional soil mapping data and field testing for the Nevada portion of the Truckee River watershed. Although the SSURGO data includes detailed information about soil properties in the area of the study, it can be inaccurate due to the technology and methods used to collect the data, the age of the data, and the purpose of the original Soil Survey. DRI has developed a procedure for updating the SSURGO soils mapping using additional geologic maps of the watershed and field verification by a Soils Scientist. This process is very efficient and provides a better estimate of soil texture classes needed for accurate hydrologic simulation. DRI will develop a new soils overlay map divided into approximately 15 soil groups based on soil textures and urbanization. Approximately 14 locations in each soil group will be selected as test locations for the field infiltration testing detailed in Task 2.2.

The field work required for the remapping of the soils within the Nevada portion of the Truckee River watershed will be completed in approximately two weeks.

2.2 Field Infiltration Testing and Sampling: For each major soil group (approximately 14 units), 15 locations (210 locations total) will be selected for field infiltration testing and three locations (42 locations total) for soil sampling. At each of the 210 test locations, a pressure controlled and rainfall simulation test will be conducted. Forty-two (42) soil samples will be collected for laboratory analyses of particle size distribution and soil bulk density.

2.3 Data Analysis for Soil Hydraulic Parameters: Soil hydraulic properties will be derived from the experimental data. Conversion from site specific Green & Ampt parameters to soil group Green & Ampt parameters will be conducted. The work conducted in these Soils Mapping and Field Testing tasks will enable the Truckee River Watershed Regional Hydrologic Model to utilize the most current and best available soils information in the region which will significantly strengthen the reliability of the model's computed precipitation-to-runoff response results.

Task 2 Due Date: January 10, 2011

The completion of this task will coincide with a joint meeting with the TRFMP Management and the Modeling Subcommittee. Following this meeting, Manhard will produce a Task Completion memo. As stated in the Task Authorization Schedule, Tasks 3, 4, and 6 are ongoing at the time we complete Task 2. There is no Authorization to Proceed request needed at this time in the project schedule.

Task 2 Interim Deliverables:

- Site location map of testing locations (210 total) and sampling locations (42 total); and
- Database of field and laboratory test results.

Task 2 Final Deliverables:

- Digital GIS layer of updated soils mapping;
- Table of Final Green & Ampt parameters by soils texture class; and
- Technical report summarizing the testing, sampling, and analysis procedures.

Task 2 Fee Estimate: \$98,870

TASK 3. GSSHA MODEL DEVELOPMENT

Introduction: This task will include the model setup and parameter development for the GSSHA hydrologic model. The snow accumulation and snowmelt model enhancements will be added in Task 4. The GSSHA model will be divided into sub-models by major drainage features and/or watershed basins to keep the overall model size and computer computation/ execution time manageable. At this time, it is anticipated that nine sub-models will be developed as outlined below in Table 1. For the purposes of this Scope of Services, the term “GSSHA Model” is used to describe the sub-models – collectively.

Table 1: Anticipated GSSHA Sub-models

Sub-model ID	Basin Name	Description	Drainage Area (Sq. Mi.)
1	Truckee River - Upper	Drainage area between the outlet of Lake Tahoe and the confluence with the Little Truckee River	194.8
2	Little Truckee River	Little Truckee River Watershed	172.5
3	Truckee Canyon	Truckee River between confluence with Little Truckee River and the USGS streamflow gage at Farad	93.0
4	Reno West	Truckee River between Farad gage and the USGS streamflow gage at Mogul	67.3
5	Reno-Sparks	Truckee River between the Mogul gage and the Vista Narrows	82.8
6	Washoe Lake	All tributary area	83.7
7	Steamboat Creek	Steamboat Creek between Washoe Lake and confluence with Boynton Slough	97.6
8	Boynton Slough	All tributary area to its confluence with Steamboat Creek	49.1
9	North Truckee Drain	All tributary area to its confluence with the Truckee River	81.3
Total Drainage Area			922.1

The DEM developed in Task 1.1 will be used to delineate drainage basins into the sub-model areas listed in Table 1. Once the sub-model area is defined, a 30-meter grid will be overlaid and average elevations calculated from the DEM to create the GSSHA elevation grid. In general, the study area will discretized into 30 meter grid cells to create a GSSHA computational grid. However, to decrease model computation time, it is anticipated that larger grid cell sizes (up to 100 meters) will be used for the sub-models located in the California portions of the study area – specifically sub-models 1 through 3 in Table 1.

3.1 Setup Watershed Characteristics: To ensure a robust model, the model will be developed using a step-by-step process starting with uniform roughness, uniform precipitation, no stream networks, no infiltration, no snowmelt, and no stream networks. Each of these model components will be added one by one as the model is tested and run through rigorous quality assurance and quality control checks. The watershed characteristics for the 922 square mile study area will be imported from the GIS layers developed in Task 1 into coverages in the Watershed Modeling System (WMS). The input layers will include land use, soils, impervious area, streams, major stormwater management facilities (regionally significant improvements), and detention basins. Lookup tables that relate model parameters to the above WMS coverages will be developed and imported into the GSSHA model. The following lookup tables will be developed:

- Overland Flow Roughness (Manning's N-Value) – related to land use;
- Retention Depth (i.e. Depressional Storage) - related to land use;
- Impervious Area - related to land use;
- Green and Ampt Infiltration Parameters related to soils, including
 - Hydraulic Conductivity
 - Capillary Head
 - Porosity
 - Pore Index
 - Residual Saturation
 - Field Capacity
 - Wilting Point; and
- Initial Soil Moisture Content - related to land use and soils.

Task 3.2 Add 1-D Hydraulics (streams, culverts, detention basins, etc.): In the GSSHA model, rainfall excess in each grid cell is converted to stormwater runoff and conveyed from cell to cell by means of 2-D overland flow. Once overland flow reaches a cell with a defined stream, the flow is transferred to the 1-D hydraulic portion of the GSSHA model. Streams are defined using a vector layer of the stream centerlines. Stream networks will be added to the GSSHA model using the stream centerline layer developed in Task 1. Channel sizes (width, depth, and side slope) collected in Task 1 will be entered into the GSSHA model for each stream reach. Stream reaches will be defined by changes in channel and/or overbank cross section. Regionally Significant stormwater facilities will be added to the hydraulic network using performance rating curves. The rating curves will be developed using standard hydraulic calculations and computer programs such as Bentley's CulvertMaster, FlowMaster, HEC-RAS and Hydraflow Hydrographs. Storage areas will be added to the streams at locations of detention basins and behind roadway embankments with significant storage. Significant storage will be defined as roadway crossings with more than 4 (four) feet of head loss between the upstream and downstream ends of the roadway structure.

Task 3.3 Setup Storm Event Precipitation: Precipitation input files will be developed for the 2005 calibration event and the 1997 and 2008 validation events. Precipitation for these events is available as Gage-Adjusted Radar Rainfall (GARR or calibrated NEXRAD data). This data will be converted to a text file with the GSSHA precipitation input file format. The GARR data is converted to gages for each NEXRAD cell. The GSSHA model uses the Thiessen polygon method to distribute the gage data across the entire watershed.

Task 3.4 Running and Troubleshooting Models: Once all of the input files have been successfully created, the GSSHA model will be executed. Several initial runs will be computed to determine the

appropriate time step for the model. Typically, several runs are necessary to identify any missing or incorrect data. Further refinements to the streams may be necessary to accurately convey runoff throughout the model.

Task 3.5 Model QA/QC: Model QA/QC will be performed throughout the model development process. A QA/QC reviewer will be identified for each model development task. This reviewer will not be directly involved in creating the model input data. As each input data type is compiled, it will be reviewed to ensure it matches the original data. When the data is converted to the text input files for the GSSHA model, individual components of the model will be reviewed by the QA/QC reviewer.

Task 3 Due Date: May 13, 2011

The completion of this task will coincide with a joint meeting with the TRFMP Management and the Modeling Subcommittee. Following this meeting, a formal presentation will be prepared and delivered to the Technical Advisory Committee (TAC) at a regularly scheduled TAC meeting to explain and progress on the project up to this point. Following the TAC meeting, Manhard will produce a Task Completion memo and Authorization to Proceed request for the TRFMP on Task 5. Note: Tasks 3 and 4 are completed on the same day, and Task 6 is ongoing. Manhard will not proceed beyond this task without written authorization.

Task 3 Interim Deliverables:

- ◆ Large format map of sub-model basins;
- ◆ Look up tables for model parameters;
- ◆ Spreadsheets with rating curves and stage-area tables for stormwater management facilities; and
- ◆ Interim uncalibrated GSSHA model files developed to this point.

Task 3 Final Deliverables:

- ◆ Uncalibrated GSSHA model files developed to this point.

Task 3 Fee Estimate: \$237,699

TASK 4. SNOW ACCUMULATION/SNOWMELT MODEL ENHANCEMENTS

Introduction: The snow accumulation and snowmelt processes can have significant impacts on stormwater runoff volumes. Precipitation falling in the form of liquid rainfall can significantly increase the melting of a ripe snow pack and lead to runoff volumes much larger than would be experienced without an existing snow pack. Alternatively, a frozen snow pack combined with relatively low atmospheric temperatures can cause rainfall to be absorbed and frozen in the snow pack with relatively little runoff.

Task 4.1 Compile and Analyze SNOTEL Data: SNOTEL data will be collected from available gages during the 2005 calibration event, as well as the 1997 and 2008 validation events. DRI has additional historical snowfall and snowpack gage data not included in the SNOTEL network. This data will be compiled and analyzed in order to estimate snowmelt model parameters.

Task 4.2 Develop Snow Model: An energy balance method of estimating snowfall accumulation and melting is included in the GSSHA program. The energy balance method applies the amount of heat available to the snowpack and the amount of melt-water is calculated. The required inputs for this

model include: air temperature (T_a), relative humidity (rh), wind speed (U), barometric pressure (Pa), and cloud cover. DRI scientists that are experts in the area of snow accumulation and snowmelt will be consulted to develop accurate parameters for the GSSHA model to accurately describe the initial snowpack during the calibration events. These parameters will be calibrated along with the initial moisture and Green & Ampt parameters.

Task 4 Due Date: May 13, 2011

At the culmination of this task, Manhard will produce a Task Completion memo. At this point in the project schedule, Task 6 is ongoing and an Authorization to Proceed request for the TRFMP on Task 5 will be provided (as mentioned at the end of Task 3). Note: Tasks 3 and 4 are completed on the same day. Manhard will not proceed beyond this task without written authorization.

Task 4 Interim Deliverables:

- Summary of initial snowmelt model parameters.

Task 4 Final Deliverables:

- Summary of calibrated snowmelt model parameters;
- Summary of development, calibration, and results of the snowmelt portion of the GSSHA model; and
- Uncalibrated GSSHA Model with Snowmelt.

Task 4 Fee Estimate: \$52,795

TASK 5. GSSHA MODEL CALIBRATION AND VALIDATION

Introduction: Following model development, the model will be calibrated utilizing the gage adjusted NEXRAD precipitation and stream gage data. Separate precipitation input files from gage adjusted NEXRAD data for the 1997, 2005 and 2008 storms will be developed and used for calibration and validation of the model throughout the study area.

Task 5.1 Parameter Optimization Along Truckee River and Tributaries: The 2005 New Years Eve storm event will be used for the calibration event. Calibration is to be performed by changing infiltration parameters (Green & Ampt), initial moisture content, and other applicable parameters so that simulated stream flows match stream flows observed during the event.

Task 5.2 Model Troubleshooting/Validation: The model will be validated using the 1997 and 2008 gage adjusted NEXRAD precipitation and observed stream flows. Observations from twenty-eight stream gages have been identified and are available for comparison to the model results. Gage data from these gages and any additional gage data obtained during Task 1 will be utilized for this task.

Task 5.3 Gage Network Analysis: An analysis of the existing gage network will be performed to provide recommendations on improvements to the existing system. The recommendation will include future precipitation and stream gage locations that would improve the model calibration process. For example, it may be advantageous to have gages on several tributaries with various slopes so that calibration of additional model parameters can be conducted.

Task 5 Due Date: June 29, 2011

The completion of this task will coincide with a joint meeting with the TRFMP Management and the Modeling Subcommittee. Following this meeting, Manhard will produce a Task Completion memo and

Authorization to Proceed request for the TRFMP on Tasks 7 and 8. Manhard will not proceed beyond this task without written authorization.

Task 5 Interim Deliverables:

- Summary tables comparing initial model results to gage data; and
- Interim calibrated GSSHA model files developed to this point.

Task 5 Final Deliverables:

- Summary tables comparing initial and calibration model results to gage data;
- Summary of GSSHA model calibration and validation methodology and results; and
- Final Calibrated GSSHA model files developed to this point.

Task 5 Fee Estimate: \$85,460

TASK 6. REGIONAL DESIGN AND WATERSHED-TESTING STORM DEVELOPMENT

Introduction: Manhard staff and DRI scientists will work with TRFMP staff to develop definitive hypothetical design storms and strategies to incorporate storm centering, areal reduction, and snow accumulation/snowmelt concepts throughout the study area. This task will include analysis of existing information such as NOAA Atlas 2 and 14 data as well as information from the distribution of the storms observed in 1997, 2005 and 2008 to assist in the development of storm centering, areal reduction and snowmelt strategies. The resulting design storms and strategies will be incorporated into the TRFMP Model User's Manual.

Task 6.1 Analysis of Existing Data (NOAA Atlas 2 and 14, Observed Storms): Existing historical precipitation data will be reviewed. Manhard will make recommendations on which data should be used for various parts of the Truckee River watershed. It is anticipated that the final NOAA Atlas 14 for California will be released during the first quarter of 2011. This task will include review of this data and recommendations for its use.

Task 6.2 Develop Design Storms (Storm Centering, Areal Reduction Strategy): Manhard will develop recommendations of general design storms to be used within the Truckee River watershed. Design storms specific to individual TRFMP project sponsors will be developed in the future. It is anticipated that several different design storms will be developed with different storm centering, areal reduction, skew, snowmelt contributions, etc. Storm temporal distributions will be developed using guidance from NOAA Atlas 14. Initial recommendations will be presented to the TRFMP staff for review and comment. Final recommendations for hypothetical design storms will be provided based on comments from TRFMP staff.

Task 6.3 Run Design Storm Models & Compare/Summarize Results: The final, calibrated GSSHA model will be run with the design and preliminary watershed-testing storms. The results of these model runs will be provided in summary tables.

Task 6.4 Develop Preliminary Watershed-Testing Storm: A preliminary watershed-testing storm will be developed for evaluation of land use change impacts. This theoretical storm will not necessarily be defined by a specific return period. The preliminary watershed-testing storm will include precipitation in the form of rainfall and snowfall over the sub-models and the entire study area.

Additional refinements of the hypothetical design and watershed-testing storms, developed in this task, are anticipated beyond the scope of Phase 2 so that regulatory design storms may be defined for the

governing bodies included in the study area. The regulatory design storms will be developed in close coordination with the TRFMP Modeling Subcommittee and each Flood Project sponsor.

Task 6 Due Date: July 15, 2011

The completion of this task will coincide with a joint meeting with the TRFMP Management and the Modeling Subcommittee. Following this meeting, Manhard will produce a Task Completion memo. At this point in the project schedule, all Tasks (1-10) are authorized.

Task 6 Interim Deliverables:

- ◆ Initial recommendations for hypothetical design and watershed-testing storms, including:
 - Temporal Distributions
 - Spatial Distributions
 - Storm Skew
 - Areal Reduction
 - Snowmelt Contribution, and
- ◆ Interim digital GIS layers of spatial distribution of hypothetical design and watershed-testing storms; and
- ◆ GSSHA precipitation input model files developed to this point.

Task 6 Final Deliverables:

- ◆ Final recommendations for hypothetical design and watershed-testing storms, including:
 - Temporal Distributions
 - Spatial Distributions
 - Storm Skew
 - Areal Reduction
 - Snowmelt Contribution, and
- ◆ Final digital GIS layers of spatial distribution of hypothetical design and watershed-testing storms; and
- ◆ GSSHA precipitation input model files developed to this point.

Task 6 Fee Estimate: \$35,390

TASK 7. MODEL DEVELOPMENT/DOCUMENTATION REPORT (TECHNICAL TRFMP MODEL MANUAL)

Task 7.1 Prepare Draft Report: Manhard will prepare a draft report that documents the model development and calibration process including watershed characteristics, rainfall data, snowmelt development, parameter optimization, theories and assumptions, etc. This purpose of the report is to detail how the model was compiled and tested, the report will not be needed to operate the model. This document will have the main title of “*Technical TRFMP Model Manual*” with the subtitle of “*Model Development/Documentation Report.*” It is anticipated this draft document will be circulated for review through the TRFMP Modeling Subcommittee

Task 7.2 Prepare Final Report: Manhard will address review comments and concerns and prepare a final version of this report for subsequent uses. It is understood that this report will not be a standard hydrology and hydraulics technical document. Rather, this report will describe the decisions, issues, resolutions, and guidance provided by the TRFMP Modeling Subcommittee during the project. Additionally, the report will describe any scope of work changes, provide the basis for scope deviations, and explain the outcomes of such actions. Technical appendices will be included to detail and document

the model parameter developments, precipitation input developments, and calibration and verification calculations.

Task 7 Due Date: September 20, 2011

This task will culminate with a formal presentation to the TAC at a regularly schedule TAC meeting to explain and progress on the project up to this point. Following this presentation, Manhard will produce a Task Completion memo. At this point in the project schedule, all Tasks (1-10) are authorized.

Task 7 Interim Deliverables:

- Draft (Digital) of the Technical TRFMP Model Manual (1 copy); and
- Draft (Hard Copy) Technical TRFMP Model Manual (5 copies).

Task 7 Final Deliverables:

- Final (Digital) of the Technical TRFMP Model Manual (1 copy); and
- Final (Hard Copy) of the Technical TRFMP Model Manual (5 copies).

Task 7 Fee Estimate: \$40,630

TASK 8. TRFMP MODEL USER'S MANUAL/TRFMP STAFF AND MODELING SUBCOMMITTEE TRAINING

Task 8.1 Develop TRFMP Model User's Manual: Manhard will prepare an *TRFMP Model User's Manual* to be used for TRFMP staff and Modeling Subcommittee training purposes and guidance on how to (1) use the model (including sub-model manipulations) to evaluate a variety of land use change scenarios based upon regional planning maps and proposed individual developments, (2) input existing and proposed detailed site stormwater management and conveyance controls, and (3) manage the model GIS databases and updates.

Task 8.2 TRFMP Staff and Modeling Subcommittee Training: Manhard will train TRFMP staff and offer to train the Modeling Subcommittee for one 3-day training course in the theoretical background and application of the model so that all participants in the training will be able to run and update the model.

Task 8 Due Dates: User's Manual September 23, 2011/Training October (TBD) 2011

At the culmination of this task, Manhard will produce a Task Completion memo. At this point in the project schedule, all Tasks (1-10) are authorized.

Task 8 Interim Deliverables:

- Draft (Digital) of the TRFMP Model User's Manual (1 copy); and
- Draft (Digital) of the training course materials and examples.

Task 8 Final Deliverables:

- Final (Digital) of the TRFMP Model User's Manual (1 copy);
- Final digital and hard copy training course materials and examples; and
- One 3-day training class.

Task 8 Fee Estimate: \$44,395

TASK 9. MEETINGS AND PRESENTATIONS

Task 9.1 Monthly Progress Meetings: Informal monthly progress meetings (as needed - 9 total meetings maximum) with TRFMP management team for the purposes of information exchange and project management. These meetings are anticipated to require no more than 1-hour of meeting time per month with no preparation, agendas, or meeting deliverables required;

Task 9.2 Quarterly Joint TRFMP and Modeling Subcommittee Meetings: Formal joint meetings (four total) with TRFMP management and the Modeling Subcommittee coinciding with Task Completion memos and Authorization to Proceed requests for Tasks 2, 3, 5, and 6. These meetings are anticipated to require no more than 2-hours of meeting time but adequate meeting preparation, agendas, and meeting deliverables are included.

Task 9.3 TAC Presentations: Formal presentations (two total) to Technical Advisory Committee at middle and end of project corresponding with the completion of Tasks 3 and 7. The presentations are anticipated to require no more than 3-hours and will be provided via MS PowerPoint productions with handouts (as needed) to explain up-to-date model development progress and uses.

Task 9 Due Dates: Monthly, Quarterly, and Semi-Annually

Final Deliverables:

- ◆ Meeting Agendas;
- ◆ Meeting Minutes;
- ◆ Meeting Handouts (as needed); and
- ◆ MS PowerPoint Presentations.

Task 9 Fee Estimate: \$28,970

TASK 10. PROJECT MANAGEMENT

Task 10.1 Project Management and Reporting Activities: Careful and consistent project management and reporting will be crucial to the success of this project. Manhard is committed to providing local project management that will provide: monthly progress reports; schedules; invoicing and budget tracking; sub-consultant management and coordination; orchestration and coordination of meetings and deliverables; and Quality Assurance and Quality Control.

Task 10 Due Dates: Monthly

Final Deliverables:

- ◆ Monthly Progress Reports; and
- ◆ Monthly Invoices.

Task 10 Fee Estimate: \$32,250

FEE ESTIMATE

The total time and materials not-to-exceed fee estimate for Tasks 1 through 10 is \$830,770.00. This fee is based on Exhibit B, our Schedule of Time and Materials Rates for 2010, as further detailed in Exhibit C, our Detailed Cost Estimate for the tasks proposed herein. Manhard will not exceed this total fee estimate without written authorization from the TRFMP. A summary of estimated fees per proposed tasks is provided below.

Task	Description	Estimate
1	Data Collection and Compilation	\$ 174,311
2	Soil Mapping and Field Testing	\$ 98,870
3	GSSHA Model Development	\$ 237,699
4	Snow Accumulation/Snowmelt Model Enhancements	\$ 52,795
5	GSSHA Model Calibration and Validation	\$ 85,460
6	Regional Design and Impact Storm Development	\$ 35,390
7	Model Development and Documentation Report	\$ 40,630
8	O&M Manual/TRFMP Staff and Modeling Subcommittee Training	\$ 44,395
9	Meetings and Presentations	\$ 28,970
10	Project Management	\$ 32,250
	Total	\$ 830,770

END OF EXHIBIT A – SCOPE OF SERVICES

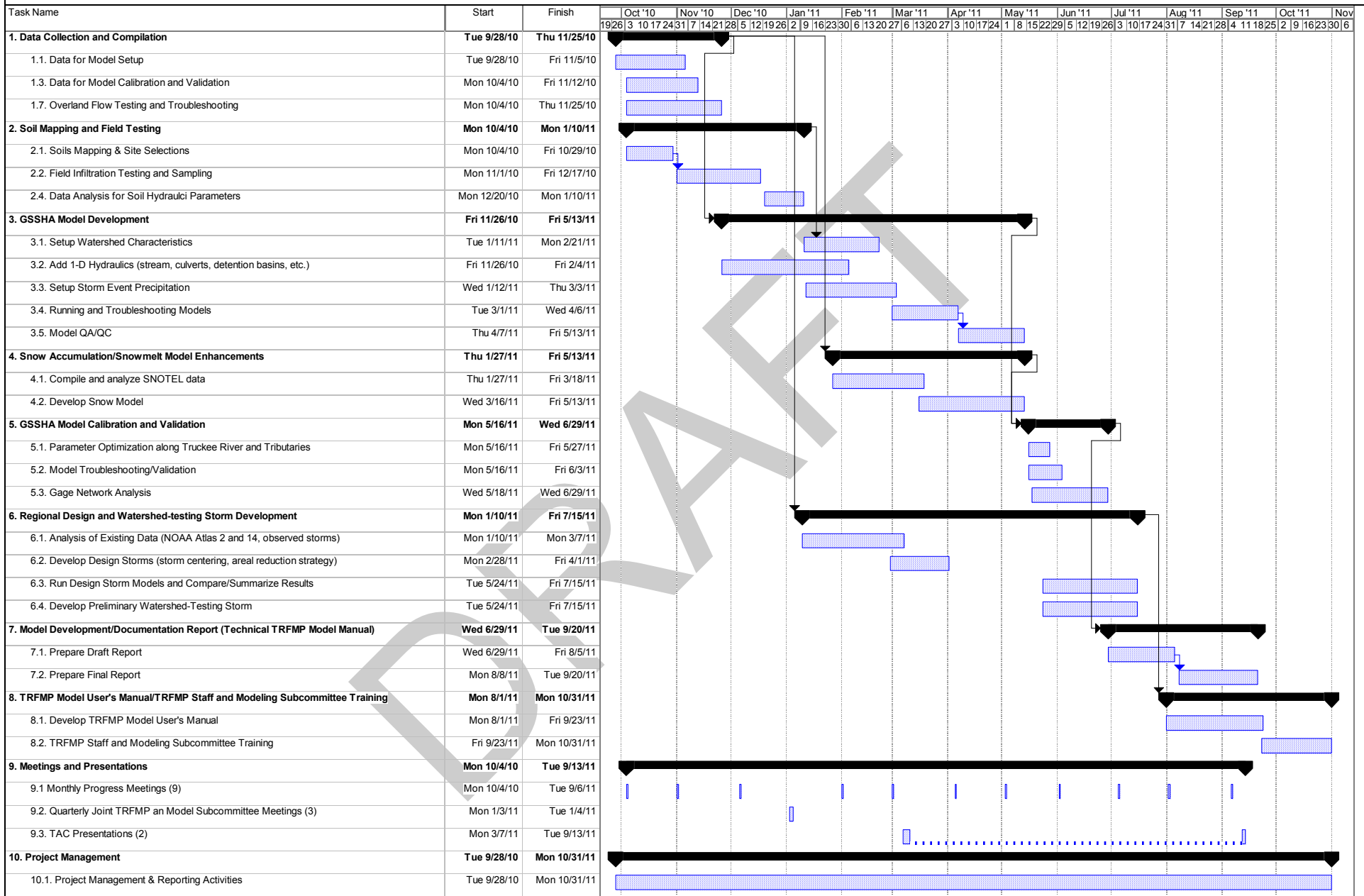
EXHIBIT B
SCHEDULE OF TIME
AND MATERIAL RATES FOR 2010

<u>CATEGORY</u>	<u>CURRENT HOURLY RATES</u>
President/Executive Vice-President	\$175.00
Vice President	\$165.00 - \$190.00
Area Manager/Director	\$120.00 - \$175.00
Senior Project Manager	\$120.00 - \$160.00
Project Manager	\$100.00 - \$140.00
Project Engineer	\$92.00 - \$100.00
Staff Engineer	\$78.00 - \$85.00
Senior Planner	\$105.00 - \$140.00
Land Planner	\$75.00 - \$92.00
Landscape Designer/Architect	\$75.00 - \$85.00
Environmental Scientist	\$70.00 - \$95.00
Operations Manager	\$100.00
Operator	\$55.00 - \$72.00
Project Surveyor	\$100.00
Staff Surveyor	\$75.00 - \$85.00
Construction Manager/Coordinator	\$75.00 - \$115.00
Field Crew Chief	\$100.00
Instrument Person	\$58.00
Survey/Construction Technician	\$60.00 - \$75.00
Remediation Field Technician	\$70.00 - \$80.00
GPS Base Station w/Two Receivers	\$30.00
Geodimeter	\$20.00
Engineering CADD Technician	\$75.00 - \$90.00
CADD Work Station	\$42.00
2-Person Crew	\$158.00
3-Person Crew	\$216.00
Administrative Assistant	\$48.00 - \$62.00
Expert Testimony & Depositions	\$195.00
	CURRENT SF RATE
Printing – Paper	\$0.15
Printing – Vellum	\$1.75
Printing – Mylar, Film, Clear Acetate	\$2.50

EXHIBIT C - DETAILED COST ESTIMATE
Truckee River Watershed Regional Hydrologic Model
Watershed Area = 922 square miles

TASK	Team Hours											TOTAL
	PIC	PM	Tech. PM/Senior Eng	Senior Eng	Project Eng	Staff Eng	Hydrologist	Geomorph-ologist/Soil Scientist	Field/Lab Scientist	Lab Tests	Admin.	
	\$190	\$155	\$140	\$155	\$95	\$78	\$85	\$90	\$70	\$100	\$55	
1 Data Collection and Compilation	14	30	353	136	467	522	124	0	0	0	16	\$174,311
1.1 Data for Model Setup	10	20	169	96	261	317	36				16	\$97,001
1.2 Data for Model Calibration and Validation	2	4	24	8	46	125	40					\$23,120
1.3 Overland Flow Testing and Troubleshooting	2	6	160	32	160	80	48					\$54,190
2 Soil Mapping and Field Testing	0	0	0	0	24	0	0	584	269	252	0	\$98,870
2.1 Soils Mapping & Site Selections					4			80	45			\$10,730
2.2 Field Infiltration Testing and Sampling					10			224	224	252		\$61,990
2.3 Data Analysis for Soil Hydraulic Parameters					10			280				\$26,150
3 GSSHA Model Development	40	63	400	340	560	468	258	0	0	0	0	\$237,699
3.1 Setup Watershed Characteristics	4	5	120	30	160	100	42					\$49,555
3.2 Add 1-D Hydraulics (stream,culverts,detention basins,etc.)	8	12	120	32	80	8	160					\$46,964
3.3 Setup Storm Event Precipitation	6	6	80	18	80	20	40					\$28,620
3.4 Running and Troubleshooting Models	6	8	80	140	160	160	16					\$64,320
3.5 Model QA/QC	16	32		120	80	180						\$48,240
4 Snow Accumulation/Snowmelt Model Enhancements	2	8	160	0	120	80	131	0	0	0	0	\$52,795
4.1 Compile and Analyze SNOTEL Data			40			40	66					\$14,330
4.2 Develop Snow Model	2	8	120		120	40	65					\$38,465
5 GSSHA Model Calibration and Validation	16	0	120	180	200	240	0	0	0	0	0	\$85,460
5.1 Parameter Optimization along Truckee River and Tributaries			40	60	80	80						\$28,740
5.2 Model Troubleshooting/Validation			40	80	80	120						\$34,960
5.3 Gage Network Analysis	16		40	40	40	40						\$21,760
6 Regional Design and Watershed-Testing Storm Development	4	6	86	12	110	0	110	0	0	0	0	\$35,390
6.1 Analysis of Existing Data (NOAA Atlas 2 and 14, observed storms)		2	12		40		60					\$10,890
6.2 Develop Design Storms (storm centering, areal reduction strategy)	2	2	50	8	20		50					\$15,080
6.3 Run Design Storm Models & Compare/Summarize Results	1	1	12	2	25							\$4,710
6.4 Develop Preliminary Watershed-Testing Storm	1	1	12	2	25							\$4,710
7 Model Development/Documentation Report (Technical TRFMP Model Manual)	20	31	114	0	105	40	0	0	0	0	54	\$40,630
7.1 Prepare Draft Report	12	19	90		80	24					32	\$29,057
7.2 Prepare Final Report	8	12	24		25	16					22	\$11,573
8 TRFMP Model Users Manual/TRFMP Staff and Modeling Subcommittee Training	8	60	130	60	24	0	0	0	0	0	69	\$44,395
8.1 Develop TRFMP Model User's Manual	8	36	70	36	24						60	\$28,060
8.2 TRFMP Staff and Modeling Subcommittee Training (3-Day Course)		24	60	24							9	\$16,335
9 Meetings and Presentations	39	39	80	0	24	0	0	0	0	0	37	\$28,970
9.1 Monthly Progress Meetings (9)	18	18	30		18						18	\$13,110
9.2 Quarterly Joint TRFMP and Modeling Subcommittee Meetings (3)	9	9	18		6						9	\$6,690
9.3 TAC Presentations (2)	12	12	32								10	\$9,170
10 Project Management	40	40	120	0	0	0	0	0	0	0	30	\$32,250
10.1 Project Management and Reporting Activities	40	40	120								30	\$32,250
Totals	175	217	1433	668	1610	1350	623	584	269	252	137	\$830,770

DRAFT



Project: Truckee River Watershed Regional Hydrologic Model
Date: Wed 9/8/10

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			





Civil Engineers
Surveyors
Water Resources Engineers
Water & Wastewater Engineers
Construction Managers
Environmental Scientists
Landscape Architects
Planners

September 30, 2010

Ms. Naomi S. Duerr, PG
Director
Truckee River Flood Project
9390 Gateway Drive, Suite 230
Reno, NV 89521

RE: Truckee River Watershed Regional Hydrologic Model - Phase 2

Dear Ms. Duerr:

Manhard Consulting, Ltd. (Manhard) would like to thank you for the opportunity to submit this Scope of Services, Schedule of Time and Material Rates, Detailed Cost Estimate, and Project Schedule for Phase 2 of the Truckee River Watershed Regional Hydrologic Model contract for the Truckee River Flood Management Project (TRFMP). The objective of the Phase 2 Scope of Services is to develop a planning level regional hydrologic model for the Truckee River watershed that can assist in the evaluations of impacts to stormwater flow, volume, and timing due to development, land use changes, and flood mitigation measures in the watershed. The model will provide useful information to policy makers when evaluating impacts to determine if policy or codes require updates for public safety. Additionally, detailed model development documentation, model upkeep/maintenance, and model-use training will be provided.

BACKGROUND

The Truckee River watershed is comprised of the entire Lake Tahoe basin, the Truckee River, and the Pyramid Lake Systems and covers an area of approximately 2,720 square miles. For the purposes of this study, a planning level model will be developed for the area extending from the outlet of Lake Tahoe, in California, and all the contributing area up to the Vista Narrows, in Nevada. This area also includes the Washoe Lake watershed as it contributes flow to the Truckee River segment under consideration via Steamboat Creek. The total study area is approximately 922 square miles.

The TRFMP seeks a hydrologic model that can be used to evaluate impacts of both large (>100 acres) and small (~5 acres) scale developments, accounts for both surface and subsurface flows, is scalable, has robust open and closed system routing capabilities, and is easily editable for incorporating model changes. The U.S. Army Corps of Engineers' (USACE) Gridded Surface Subsurface Hydrologic Analysis software package (GSSHA) was selected as most suited for the TRFMP's needs and will be used to develop the Truckee River Watershed Regional Hydrologic Model (TRFMP Model), based on the results

from Phase 1 (Sun Valley Watershed Pilot Study/Model Evaluation) of the Truckee River Watershed Regional Hydrologic Model contract.

Manhard proposes to perform the Phase 2 work as detailed in the attached Exhibit A - Scope of Services on a Time and Materials Not-to-Exceed basis for \$875,160.00. Also attached are Exhibits B, C, and D that contain Manhard's Schedule of Time and Materials Rates for 2010, Detailed Cost Estimate, and Project Schedule, respectively. The Project Schedule (Exhibit D) mirrors the Scope of Services and Detailed Cost Estimate, and outlines our plan for delivering the work associated with Phase 2 of the Truckee River Watershed Regional Hydrologic Model contract. The Project Schedule is based on an assumed November 1, 2010 notice to proceed. Although the Project Schedule indicates some portions of the work effort will be completed in 2011, Manhard will bill this work using 2010 billing rates.

Thank you again for the opportunity to serve the TRFMP. Should you have any questions, please do not hesitate to contact us.

Yours truly,

MANHARD CONSULTING, LTD.



Jeff House, CFM
National Director of Water Resources
Vice-President

ACCEPTED: TRUCKEE RIVER FLOOD MANAGEMENT PROJECT

By: _____
(Authorized Representative)

Title: _____

Date: _____

EXHIBIT A - SCOPE OF SERVICES

TASK AUTHORIZATION SCHEDULE: To achieve the most efficient project Task execution, some of the Tasks outlined in this Scope of Services, need to be performed simultaneously. To achieve efficient data collection and GIS layer development, it is necessary for Tasks 1 and 2 to begin at the same time upon Notice to Proceed. At the culmination of Task 1 on January 28, 2011, Manhard will produce a Task Completion memo and Authorization to Proceed request for the TRFMP for Tasks 3, 4, and 6 simultaneously. Therefore, Task 2 will be well under way when Tasks 3, 4, and 6 begin. When Tasks 3 and 4 are complete, Task 5 can begin. When Task 5 is complete, Tasks 7 and 8 can begin. Tasks 9 and 10 are ongoing throughout the project from beginning to end. This Task authorization schedule is detailed at the end of each Task section contained herein. A detailed timeline for all Tasks is provided in Exhibit D – Project Schedule.

TASK 1. DATA COLLECTION AND COMPILATION

Introduction: Data will be collected and compiled for the purpose of setting up GSSHA model inputs. Manhard will compile, review, and update (as necessary) data already obtained and/or developed for previous hydrologic studies in the region. Data includes:

- ◆ Physiographic data - topography, land use, vegetation, soils, stream corridors, surface flow paths and patterns; and
- ◆ Stormwater management data – roadways, drainage and flood control facilities, and irrigation ditches.

1.1 Data for Model Setup: Topographic data will be developed using a combination of Washoe County's 2004, 2006, and 2007 Digital Terrain Models (DTM) and the USGS 1/3 arc-second (10 meter) National Elevation Dataset (NED). A 30-meter Digital Elevation Model (DEM) will be created for the entire Truckee River watershed by merging the best available elevation data sources.

Land Use data has been developed for a large portion of the study area using Washoe County (County) parcel data and aerial photography. Land Use layers will be developed for each of the historical precipitation events and the initial conditions used for the Truckee River Flood Project design. Stream centerlines will be developed using available County GIS data and supplemented with digitizing stream channels from aerial photography and field investigation. Channel dimensions will be field measured where channel survey data is not available.

Data for existing regionally significant stormwater management facilities will be obtained from available County GIS, previous studies, and field surveys. Regionally significant facilities include large-scale municipal facilities deemed critical to the control of stormwater and flooding, such as: bridges, detention basins, channels, and large diameter storm drains and culverts. Stage-storage-discharge curves and performance rating curves will be developed for each regionally significant flood control facility using available data and field surveys, as necessary.

1.2 Data for Model Calibration and Validation: Precipitation data will be compiled and transformed into GSSHA input files for use in calibrating parameters utilized by GSSHA. Gage adjusted NEXRAD event data and corresponding streamflow data from the January 1997, New Years Eve 2005, and January 2008 storm events will be utilized in the model calibration and validation. Research for additional streamflow data will be conducted to supplement existing data within areas not included in previous studies.

1.3 Overland Flow Testing and Troubleshooting: Rainfall excess in each grid cell is converted to stormwater runoff and conveyed from cell to cell by means of 2-D overland flow. These flow paths will be evaluated for accurate locations within the grid cell and connectivity between cells. Depression areas created by the surface DEM will need to be edited to provide a positive flow direction for every grid cell. The depression areas are created by roadway/dam embankments and areas where small drainage swales are not accurately depicted in the DEM.

Task 1 Due Date: January 28, 2011

At the culmination of this task, Manhard will produce a Task Completion memo and Authorization to Proceed request for the TRFMP on Tasks 3, 4, and 6 simultaneously.

Task 1 Interim Deliverables:

Digital ESRI personal geodatabase containing all interim GIS layers and tables collected in this task. The geodatabase is expected to include:

- ◆ Washoe County 2-foot topography
- ◆ Washoe County 1-foot topography
- ◆ USGS DEM (10-meter resolution) – for areas outside of Washoe County
- ◆ Washoe County GIS parcel layer with land use code
- ◆ Land use digitized from aerial photography – outside of Washoe County
- ◆ Roadway centerlines
- ◆ Stream centerlines
- ◆ Irrigation ditches
- ◆ Available stormwater drainage features

Task 1 Final Deliverables:

Digital ESRI personal geodatabase containing all final GIS layers and tables collected in this task. The geodatabase is expected to include:

- ◆ Final existing conditions land use layer – entire watershed
- ◆ Final future conditions land use layer – entire watershed
- ◆ Final 1997 conditions land use layer – entire watershed
- ◆ Final 2005 conditions land use layer – entire watershed
- ◆ Final 2008 conditions land use layer – entire watershed
- ◆ NRCS soils mapping (SSURGO) – entire watershed
- ◆ Stream centerlines (field verified)
- ◆ Regionally significant stormwater drainage features
- ◆ Final 30-meter DEM of Nevada portion of Truckee River Watershed
- ◆ Final 100-meter DEM of California portion of Truckee River watershed
- ◆ Digital Gage-Adjusted Radar Rainfall data (GIS layer and text files);
- ◆ Digital precipitation and stream gage data; and
- ◆ Excel Spreadsheet with calculations of Stage-Storage-Discharge tables for each storage routing.

Task 1 Fee Estimate: \$174,311

TASK 2. SOIL MAPPING AND FIELD TESTING

Introduction: The Manhard-DRI team, as well as other hydrology professionals in the region, has identified soils data as an area that is in need of significant improvement to more accurately estimate infiltration within the Truckee River watershed. This is a common need across the United States as the

current standard for soils data is based on USDA Soil Survey Maps that were developed between the 1930's and the 1970's using aerial imagery and limited field observation and testing. The results of this task will be an updated soils map with approximately 12 soil groups and a range of values for infiltration parameters for each soil group. These values will be based on field testing in the Nevada portion of the Truckee River watershed. For this task, the Desert Research Institute (DRI) will conduct infiltration experiments within the Nevada portion of the Truckee River watershed at selected locations.

The regional hydrologic model will use the Green & Ampt method, a physically-based infiltration approach, to estimate infiltration of rainfall into the soil. The excess rainfall that does not infiltrate into the ground is considered stormwater runoff. The Green & Ampt method requires several soil hydraulic parameters, including: saturated hydraulic conductivity, wetting front suction head, and initial soil moisture content. All of these parameters are related to physical, measurable properties of soil.

The estimation of these parameters occurs in three steps. First, the soils within the study area are classified into soil texture classes or groups (e.g. sand, loamy-sand, loam, silt, silty-loam, clay, etc.). Second, the Green & Ampt parameters are estimated for each soil texture class using field testing. Third, site-specific infiltration parameters are generalized to apply to soil groups.

2.1 Soils Mapping and Site Selections: The USDA SSURGO soils mapping data collected in Task 1 will be used as a base soils map and will be improved with additional soil mapping data and field testing for the Nevada portion of the Truckee River watershed. Although the SSURGO data includes detailed information about soil properties in the area of the study, it can be inaccurate due to the technology and methods used to collect the data, the age of the data, and the purpose of the original Soil Survey. DRI has developed a procedure for updating the SSURGO soils mapping using additional geologic maps of the watershed and field verification by a Soils Scientist. This process is very efficient and provides a better estimate of soil texture classes needed for accurate hydrologic simulation. DRI will develop a new soils overlay map divided into approximately 15 soil groups based on soil textures and urbanization. Approximately 14 locations in each soil group will be selected as test locations for the field infiltration testing detailed in Task 2.2.

The field work required for the remapping of the soils within the Nevada portion of the Truckee River watershed will be completed in approximately two weeks.

2.2 Field Infiltration Testing and Sampling: For each major soil group (approximately 14 units), 15 locations (210 locations total) will be selected for field infiltration testing and three locations (42 locations total) for soil sampling. At each of the 210 test locations, a pressure controlled and rainfall simulation test will be conducted. Forty-two (42) soil samples will be collected for laboratory analyses of particle size distribution and soil bulk density.

2.3 Data Analysis for Soil Hydraulic Parameters: Soil hydraulic properties will be derived from the experimental data. Conversion from site specific Green & Ampt parameters to soil group Green & Ampt parameters will be conducted. The work conducted in these Soils Mapping and Field Testing tasks will enable the Truckee River Watershed Regional Hydrologic Model to utilize the most current and best available soils information in the region which will significantly strengthen the reliability of the model's computed precipitation-to-runoff response results.

Task 2 Due Date: January 20, 2011

The completion of this task will coincide with a joint meeting with the TRFMP Management and the Modeling Subcommittee. Following this meeting, Manhard will produce a Task Completion memo. As stated in the Task Authorization Schedule, Tasks 3, 4, and 6 are ongoing at the time we complete Task 2. There is no Authorization to Proceed request needed at this time in the project schedule.

Task 2 Interim Deliverables:

- ◆ Site location map of testing locations (210 total) and sampling locations (42 total); and
- ◆ Database of field and laboratory test results.

Task 2 Final Deliverables:

- ◆ Digital GIS layer of updated soils mapping;
- ◆ Table of Final Green & Ampt parameters by soils texture class; and
- ◆ Technical report summarizing the testing, sampling, and analysis procedures.

Task 2 Fee Estimate: \$98,870

TASK 3. GSSHA MODEL DEVELOPMENT

Introduction: This task will include the model setup and parameter development for the GSSHA hydrologic model. The snow accumulation and snowmelt model enhancements will be added in Task 4. The GSSHA model will be divided into sub-models by major drainage features and/or watershed basins to keep the overall model size and computer computation/ execution time manageable. At this time, it is anticipated that nine sub-models will be developed as outlined below in Table 1. For the purposes of this Scope of Services, the term “GSSHA Model” is used to describe the sub-models – collectively.

Table 1: Anticipated GSSHA Sub-models

Sub-model ID	Basin Name	Description	Drainage Area (Sq. Mi.)
1	Truckee River - Upper	Drainage area between the outlet of Lake Tahoe and the confluence with the Little Truckee River	194.8
2	Little Truckee River	Little Truckee River Watershed	172.5
3	Truckee Canyon	Truckee River between confluence with Little Truckee River and the USGS streamflow gage at Farad	93.0
4	Reno West	Truckee River between Farad gage and the USGS streamflow gage at Mogul	67.3
5	Reno-Sparks	Truckee River between the Mogul gage and the Vista Narrows	82.8
6	Washoe Lake	All tributary area	83.7
7	Steamboat Creek	Steamboat Creek between Washoe Lake and confluence with Boynton Slough	97.6
8	Boynton Slough	All tributary area to its confluence with Steamboat Creek	49.1
9	North Truckee Drain	All tributary area to its confluence with the Truckee River	81.3
Total Drainage Area			922.1

The DEM developed in Task 1.1 will be used to delineate drainage basins into the sub-model areas listed in Table 1. Once the sub-model area is defined, a 30-meter grid will be overlaid and average elevations calculated from the DEM to create the GSSHA elevation grid. In general, the study area will discretized into 30 meter grid cells to create a GSSHA computational grid. However, to decrease model computation time, it is anticipated that larger grid cell sizes (up to 100 meters) will be used for the sub-models located in the California portions of the study area – specifically sub-models 1 through 3 in Table 1.

3.1 Setup Watershed Characteristics: To ensure a robust model, the model will be developed using a step-by-step process starting with uniform roughness, uniform precipitation, no stream networks, no infiltration, no snowmelt, and no stream networks. Each of these model components will be added one by one as the model is tested and run through rigorous quality assurance and quality control checks. The watershed characteristics for the 922 square mile study area will be imported from the GIS layers developed in Task 1 into coverages in the Watershed Modeling System (WMS). The input layers will include land use, soils, impervious area, streams, major stormwater management facilities (regionally significant improvements), and detention basins. Lookup tables that relate model parameters to the above WMS coverages will be developed and imported into the GSSHA model. The following lookup tables will be developed:

- ◆ Overland Flow Roughness (Manning's N-Value) – related to land use;
- ◆ Retention Depth (i.e. Depressional Storage) - related to land use;
- ◆ Impervious Area - related to land use;
- ◆ Green and Ampt Infiltration Parameters related to soils, including
 - Hydraulic Conductivity
 - Capillary Head
 - Porosity
 - Pore Index
 - Residual Saturation
 - Field Capacity
 - Wilting Point; and
- ◆ Initial Soil Moisture Content - related to land use and soils.

Task 3.2 Add 1-D Hydraulics (streams, culverts, detention basins, etc.): In the GSSHA model, rainfall excess in each grid cell is converted to stormwater runoff and conveyed from cell to cell by means of 2-D overland flow. Once overland flow reaches a cell with a defined stream, the flow is transferred to the 1-D hydraulic portion of the GSSHA model. Streams are defined using a vector layer of the stream centerlines. Stream networks will be added to the GSSHA model using the stream centerline layer developed in Task 1. Channel sizes (width, depth, and side slope) collected in Task 1 will be entered into the GSSHA model for each stream reach. Stream reaches will be defined by changes in channel and/or overbank cross section. Regionally significant stormwater facilities will be added to the hydraulic network using performance rating curves. The rating curves will be developed using standard hydraulic calculations and computer programs such as Bentley's CulvertMaster, FlowMaster, HEC-RAS and Hydraflow Hydrographs. Storage areas will be added to the streams at locations of detention basins and behind roadway embankments with significant storage. Significant storage will be defined as roadway crossings with more than 4 (four) feet of head loss between the upstream and downstream ends of the roadway structure.

Task 3.3 Setup Storm Event Precipitation: Precipitation input files will be developed for the 2005 calibration event and the 1997 and 2008 validation events. Precipitation for these events is available as Gage-Adjusted Radar Rainfall (GARR or calibrated NEXRAD data). This data will be converted to a text file with the GSSHA precipitation input file format. The GARR data is converted to gages for each NEXRAD cell. The GSSHA model uses the Thiessen polygon method to distribute the gage data across the entire watershed.

Task 3.4 Running and Troubleshooting Models: Once all of the input files have been successfully created, the GSSHA model will be executed. Several initial runs will be computed to determine the

appropriate time step for the model. Typically, several runs are necessary to identify any missing or incorrect data. Further refinements to the streams may be necessary to accurately convey runoff throughout the model.

Task 3.5 Model QA/QC: Model QA/QC will be performed throughout the model development process. A QA/QC reviewer will be identified for each model development task. This reviewer will not be directly involved in creating the model input data. As each input data type is compiled, it will be reviewed to ensure it matches the original data. When the data is converted to the text input files for the GSSHA model, individual components of the model will be reviewed by the QA/QC reviewer.

Task 3 Due Date: July 26, 2011

The completion of this task will coincide with a joint meeting with the TRFMP Management and the Modeling Subcommittee. Following this meeting, a formal presentation will be prepared and delivered to the Technical Advisory Committee (TAC) at a regularly scheduled TAC meeting to explain and progress on the project up to this point. Following the TAC meeting, Manhard will produce a Task Completion memo and Authorization to Proceed request for the TRFMP on Task 5. Note: Tasks 3 and 4 are completed on the same day, and Task 6 is ongoing. Manhard will not proceed beyond this task without written authorization.

Task 3 Interim Deliverables:

- ◆ Large format map of sub-model basins;
- ◆ Look up tables for model parameters;
- ◆ Spreadsheets with rating curves and stage-area tables for stormwater management facilities; and
- ◆ Interim uncalibrated GSSHA model files developed to this point.

Task 3 Final Deliverables:

- ◆ Uncalibrated GSSHA model files developed to this point.

Task 3 Fee Estimate: \$237,699

TASK 4. SNOW ACCUMULATION/SNOWMELT MODEL ENHANCEMENTS

Introduction: The snow accumulation and snowmelt processes can have significant impacts on stormwater runoff volumes. Precipitation falling in the form of liquid rainfall can significantly increase the melting of a ripe snow pack and lead to runoff volumes much larger than would be experienced without an existing snow pack. Alternatively, a frozen snow pack combined with relatively low atmospheric temperatures can cause rainfall to be absorbed and frozen in the snow pack with relatively little runoff.

Task 4.1 Compile and Analyze SNOTEL Data: SNOTEL data will be collected from available gages during the 2005 calibration event, as well as the 1997 and 2008 validation events. DRI has additional historical snowfall and snowpack gage data not included in the SNOTEL network. This data will be compiled and analyzed in order to estimate snowmelt model parameters.

Task 4.2 Develop Snow Model: An energy balance method of estimating snowfall accumulation and melting is included in the GSSHA program. The energy balance method applies the amount of heat available to the snowpack and the amount of melt-water is calculated. The required inputs for this

model include: air temperature (Ta), relative humidity (rh), wind speed (U), barometric pressure (Pa), and cloud cover. DRI scientists that are experts in the area of snow accumulation and snowmelt will be consulted to develop accurate parameters for the GSSHA model to accurately describe the initial snowpack during the calibration events. These parameters will be calibrated along with the initial moisture and Green & Ampt parameters.

Task 4 Due Date: May 13, 2011

At the culmination of this task, Manhard will produce a Task Completion memo. At this point in the project schedule, Task 6 is ongoing and an Authorization to Proceed request for the TRFMP on Task 5 will be provided (as mentioned at the end of Task 3). Note: Tasks 3 and 4 are completed on the same day. Manhard will not proceed beyond this task without written authorization.

Task 4 Interim Deliverables:

- ◆ Summary of initial snowmelt model parameters.

Task 4 Final Deliverables:

- ◆ Summary of calibrated snowmelt model parameters;
- ◆ Summary of development, calibration, and results of the snowmelt portion of the GSSHA model; and
- ◆ Uncalibrated GSSHA Model with Snowmelt.

Task 4 Fee Estimate: \$52,795

TASK 5. GSSHA MODEL CALIBRATION AND VALIDATION

Introduction: Following model development, the model will be calibrated utilizing the gage adjusted NEXRAD precipitation and stream gage data. Separate precipitation input files from gage adjusted NEXRAD data for the 1997, 2005 and 2008 storms will be developed and used for calibration and validation of the model throughout the study area.

Task 5.1 Parameter Optimization Along Truckee River and Tributaries: The 2005 New Years Eve storm event will be used for the calibration event. Calibration is to be performed by changing infiltration parameters (Green & Ampt), initial moisture content, and other applicable parameters so that simulated stream flows match stream flows observed during the event.

Task 5.2 Model Troubleshooting/Validation: The model will be validated using the 1997 and 2008 gage adjusted NEXRAD precipitation and observed stream flows. Observations from twenty-eight stream gages have been identified and are available for comparison to the model results. Gage data from these gages and any additional gage data obtained during Task 1 will be utilized for this task.

Task 5.3 Gage Network Analysis: An analysis of the existing gage network will be performed to provide recommendations on improvements to the existing system. The recommendation will include future precipitation and stream gage locations that would improve the model calibration process. For example, it may be advantageous to have gages on several tributaries with various slopes so that calibration of additional model parameters can be conducted.

Task 5 Due Date: September 13, 2011

The completion of this task will coincide with a joint meeting with the TRFMP Management and the Modeling Subcommittee. Following this meeting, Manhard will produce a Task Completion memo and

Authorization to Proceed request for the TRFMP on Tasks 7 and 8. Manhard will not proceed beyond this task without written authorization.

Task 5 Interim Deliverables:

- ◆ Summary tables comparing initial model results to gage data;
- ◆ Interim calibrated GSSHA model files developed to this point; and
- ◆ Draft exhibit of existing gages used in the calibration of the model and recommended locations of new gages.

Task 5 Final Deliverables:

- ◆ Summary tables comparing initial and calibration model results to gage data;
- ◆ Summary of GSSHA model calibration and validation methodology and results;
- ◆ Final Calibrated GSSHA model files developed to this point; and
- ◆ Final exhibit illustrating the locations of existing gages used in the calibration of the model and recommended locations for new gages.

Task 5 Fee Estimate: \$85,460

TASK 6. REGIONAL IMPACT STORM DEVELOPMENT

Introduction: Manhard staff and DRI scientists will work with TRFMP staff to develop definitive hypothetical impact storms and strategies to incorporate storm centering, areal reduction, and snow accumulation/snowmelt concepts throughout the study area. This task will include analysis of existing information such as NOAA Atlas 2 and 14 data as well as information from the distribution of the storms observed in 1997, 2005 and 2008 to assist in the development of storm centering, areal reduction and snowmelt strategies. The resulting hypothetical impact storms and strategies will be incorporated into the TRFMP Model User's Manual.

Task 6.1 Analysis of Existing Data (NOAA Atlas 2 and 14, Observed Storms): Existing historical precipitation data will be reviewed. Manhard will make recommendations on which data should be used for various parts of the Truckee River watershed. It is anticipated that the final NOAA Atlas 14 for California will be released during the first quarter of 2011. This task will include review of this data and recommendations for its use.

Task 6.2 Develop Hypothetical Impact Storms: Manhard will develop recommendations of hypothetical storms to be used within the Truckee River watershed. Hypothetical storms specific to individual TRFMP project sponsors will be developed in the future. Up to four different hypothetical storms will be developed with different storm centering, areal reduction, skew, snowmelt contributions, etc.

Two storms loosely based on the 100-year frequency storm event will be developed using guidance from NOAA Atlas 14. It is anticipated that these storms will be 24- and 72-hours in duration. An additional two storms (four total) will be developed as regional impact storms that incorporate watershed-averaged areal reduction and will incorporate characteristics of historical storm events.

Initial recommendations will be presented to the TRFMP staff for review and comment. Final recommendations for hypothetical impact storms will be provided based on comments from TRFMP staff.

Task 6.3 Run Hypothetical Storm Models & Compare/Summarize Results: The final, calibrated GSSHA model will be run with the hypothetical impact storms. The results of these model runs will be provided in summary tables.

Additional refinements of the hypothetical storms, developed in this task, are anticipated beyond the scope of Phase 2 so that regulatory design storms may be defined for the governing bodies included in the study area. It is anticipated that these regulatory design storms will be developed in close coordination with the TRFMP Modeling Subcommittee and the TAC.

Task 6 Due Date: July 15, 2011

The completion of this task will coincide with a joint meeting with the TRFMP Management and the Modeling Subcommittee. Following this meeting, Manhard will produce a Task Completion memo. At this point in the project schedule, all Tasks (1-10) are authorized.

Task 6 Interim Deliverables:

- ◆ Initial recommendations for hypothetical impact and watershed-testing storms, including:
 - Temporal Distributions
 - Spatial Distributions
 - Storm Skew
 - Areal Reduction
 - Snowmelt Contribution, and
- ◆ Interim digital GIS layers of spatial distribution of hypothetical impact storms; and
- ◆ GSSHA precipitation input model files for up to 4 storms developed to this point.

Task 6 Final Deliverables:

- ◆ Final recommendations for hypothetical impact and watershed-testing storms, including:
 - Temporal Distributions
 - Spatial Distributions
 - Storm Skew
 - Areal Reduction
 - Snowmelt Contribution, and
- ◆ Final digital GIS layers of spatial distribution of hypothetical impact storms; and
- ◆ GSSHA precipitation input model files for up to 4 storms.

Task 6 Fee Estimate: \$35,390

TASK 7. MODEL DEVELOPMENT/DOCUMENTATION REPORT (TECHNICAL TRFMP MODEL MANUAL)

Task 7.1 Prepare Draft Report: Manhard will prepare a draft report that documents the model development and calibration process including watershed characteristics, rainfall data, snowmelt development, parameter optimization, theories and assumptions, etc. This purpose of the report is to detail how the model was compiled and tested, the report will not be needed to operate the model. This document will have the main title of “*Technical TRFMP Model Manual*” with the subtitle of “*Model Development/Documentation Report.*” It is anticipated this draft document will be circulated for review through the TRFMP Modeling Subcommittee.

Task 7.2 Prepare Final Report: Manhard will address review comments and concerns and prepare a final version of this report for subsequent uses. It is understood that this report will not be a standard hydrology and hydraulics technical document. Rather, this report will describe the decisions, issues, resolutions, and guidance provided by the TRFMP Modeling Subcommittee during the project. Additionally, the report will describe any scope of work changes, provide the basis for scope deviations,

and explain the outcomes of such actions. Technical appendices will be included to detail and document the model parameter developments, precipitation input developments, and calibration and verification calculations.

Task 7 Due Date: November 25, 2011

This task will culminate with a formal presentation to the TAC at a regularly scheduled TAC meeting to explain and progress on the project up to this point. Following this presentation, Manhard will produce a Task Completion memo. At this point in the project schedule, all Tasks (1-10) are authorized.

Task 7 Interim Deliverables:

- ◆ Draft (Digital) of the Technical TRFMP Model Manual (1 copy); and
- ◆ Draft (Hard Copy) Technical TRFMP Model Manual (5 copies).

Task 7 Final Deliverables:

- ◆ Final (Digital) of the Technical TRFMP Model Manual (1 copy); and
- ◆ Final (Hard Copy) of the Technical TRFMP Model Manual (5 copies).

Task 7 Fee Estimate: \$40,630

TASK 8. TRFMP MODEL USER'S MANUAL/MODEL TRAINING

Task 8.1 Develop TRFMP Model User's Manual: Manhard will prepare an *TRFMP Model User's Manual* to be used for TRFMP staff and Modeling Subcommittee training purposes and guidance on how to (1) use the model (including sub-model manipulations) to evaluate a variety of land use change scenarios based upon regional planning maps and proposed individual developments, (2) input existing and proposed detailed site stormwater management and conveyance controls, and (3) manage the model GIS databases and updates.

Task 8.2 TRFMP Staff and Modeling Subcommittee Training: Manhard will train TRFMP staff and offer to train the Modeling Subcommittee for one 3-day training course in the theoretical background and application of the model so that all participants in the training will be able to run and update the model.

Task 8.3 Engineering Community Training: Manhard will offer one 3-day training course to the local engineering and scientific community in the theoretical background and application of the model so that all participants in the training will be able to run and update the model. Additional training sessions will be conducted at the request of TRFMP for an additional fee (each) not to exceed the estimated cost of this subtask (8.3), as shown in the attached Exhibit C – Detailed Cost Estimate.

Task 8 Due Dates: User's Manual October 28, 2011/Training November (TBD) 2011

At the culmination of this task, Manhard will produce a Task Completion memo. At this point in the project schedule, all Tasks (1-10) are authorized.

Task 8 Interim Deliverables:

- ◆ Draft (Digital) of the TRFMP Model User's Manual (1 copy);
- ◆ Draft (Digital) of the training course materials and examples for TRFMP staff and Modeling Subcommittee training; and
- ◆ Draft (Digital) of the training course materials and examples for the engineering and scientific community training.

Task 8 Final Deliverables:

- ◆ Final (Digital) of the TRFMP Model User's Manual (1 copy);
- ◆ Final digital and hard copy training course materials and examples for TRFMP staff and Modeling Subcommittee training;
- ◆ Final (Digital) of the training course materials and examples for the engineering and scientific community training;
- ◆ One 3-day training class for TRFMP staff and Modeling Subcommittee; and
- ◆ One 3-day training class for the local engineering and scientific community.

Task 8 Fee Estimate: \$60,850

TASK 9. MEETINGS AND PRESENTATIONS

Task 9.1 Monthly Progress Meetings: Informal monthly progress and administrative meetings (as needed - 13 total meetings maximum) with TRFMP management team for the purposes of information exchange and project management. These meetings are anticipated to require no more than 1-hour of meeting time per month with no preparation, agendas, or meeting deliverables required;

Task 9.2 Modeling Subcommittee Meetings: Formal meetings (six total) with the Modeling Subcommittee coinciding with Task Completion memos and Authorization to Proceed requests for Tasks 2, 3, 4, 5, 6 and 7. These meetings are anticipated to require no more than 2-hours of meeting time but adequate meeting preparation, agendas, and meeting deliverables are included.

Task 9.3 TAC Presentations: Formal presentations (four total) to Technical Advisory Committee at key milestones throughout the project. It is anticipated that these meeting will coincide with the completion of Task 2, Task 5, Task 7 and the end of the project. The presentations are anticipated to require no more than 3-hours and will be provided via MS PowerPoint productions with handouts (as needed) to explain up-to-date model development progress and uses.

Task 9.4 Public Outreach Forums: Two, one-day public outreach forums will be conducted by Manhard in coordination with TRFMP management. The forums will be directed at the development community and other interested parties. The forums will present the final models/reports and provide the opportunity for questions and discussions.

Task 9 Due Dates: Monthly and Project Milestones

Final Deliverables:

- ◆ Meeting Agendas;
- ◆ Meeting Minutes;
- ◆ Meeting Handouts (as needed); and
- ◆ MS PowerPoint Presentations.

Task 9 Fee Estimate: \$52,680

TASK 10. PROJECT MANAGEMENT

Task 10.1 Project Management and Reporting Activities: Careful and consistent project management and reporting will be crucial to the success of this project. Manhard is committed to providing local

project management that will provide: monthly progress reports; schedules; invoicing and budget tracking; sub-consultant management and coordination; orchestration and coordination of meetings and deliverables; and Quality Assurance and Quality Control.

Task 10 Due Dates: Monthly

Final Deliverables:

- ◆ Monthly Progress Reports; and
- ◆ Monthly Invoices.

Task 10 Fee Estimate: \$36,475

FEE ESTIMATE

The total time and materials not-to-exceed fee estimate for Tasks 1 through 10 is \$875,160.00. This fee is based on Exhibit B, our Schedule of Time and Materials Rates for 2010, as further detailed in Exhibit C, our Detailed Cost Estimate for the tasks proposed herein. Manhard will not exceed this total fee estimate without written authorization from the TRFMP. A summary of estimated fees per proposed tasks is provided below.

Task	Description	Estimate
1	Data Collection and Compilation	\$ 174,311
2	Soil Mapping and Field Testing	\$ 98,870
3	GSSHA Model Development	\$ 237,699
4	Snow Accumulation/Snowmelt Model Enhancements	\$ 52,795
5	GSSHA Model Calibration and Validation	\$ 85,460
6	Regional Impact Storm Development	\$ 35,390
7	Model Development/Documentation Report	\$ 40,630
8	TRFMP Model Users Manual/Model Training	\$ 60,850
9	Meetings and Presentations	\$ 52,680
10	Project Management	\$ 36,475
	Total	\$ 875,160

END OF EXHIBIT A – SCOPE OF SERVICES

EXHIBIT B
SCHEDULE OF TIME
AND MATERIAL RATES FOR 2010

<u>CATEGORY</u>	<u>CURRENT HOURLY RATES</u>
President/Executive Vice-President	\$175.00
Vice President	\$165.00 - \$190.00
Area Manager/Director	\$120.00 - \$175.00
Senior Project Manager	\$120.00 - \$160.00
Project Manager	\$100.00 - \$140.00
Project Engineer	\$92.00 - \$100.00
Staff Engineer	\$78.00 - \$85.00
Senior Planner	\$105.00 - \$140.00
Land Planner	\$75.00 - \$92.00
Landscape Designer/Architect	\$75.00 - \$85.00
Environmental Scientist	\$70.00 - \$95.00
Operations Manager	\$100.00
Operator	\$55.00 - \$72.00
Project Surveyor	\$100.00
Staff Surveyor	\$75.00 - \$85.00
Construction Manager/Coordinator	\$75.00 - \$115.00
Field Crew Chief	\$100.00
Instrument Person	\$58.00
Survey/Construction Technician	\$60.00 - \$75.00
Remediation Field Technician	\$70.00 - \$80.00
GPS Base Station w/Two Receivers	\$30.00
Geodimeter	\$20.00
Engineering CADD Technician	\$75.00 - \$90.00
CADD Work Station	\$42.00
2-Person Crew	\$158.00
3-Person Crew	\$216.00
Administrative Assistant	\$48.00 - \$62.00
Expert Testimony & Depositions	\$195.00
	CURRENT SF RATE
Printing – Paper	\$0.15
Printing – Vellum	\$1.75
Printing – Mylar, Film, Clear Acetate	\$2.50

EXHIBIT C - DETAILED COST ESTIMATE
Truckee River Watershed Regional Hydrologic Model
Watershed Area = 922 square miles

TASK	Team Hours											TOTAL
	PIC	PM	Tech. PM/Senior Eng	Senior Eng	Project Eng	Staff Eng	Hydrologist	Geomorphologist/Soil Scientist	Field/Lab Scientist	Lab Tests	Admin.	
	\$190	\$155	\$140	\$155	\$95	\$78	\$85	\$90	\$70	\$100	\$55	
1 Data Collection and Compilation	14	30	353	136	467	522	124	0	0	0	16	\$174,311
1.1 Data for Model Setup	10	20	169	96	261	317	36				16	\$97,001
1.2 Data for Model Calibration and Validation	2	4	24	8	46	125	40					\$23,120
1.3 Overland Flow Testing and Troubleshooting	2	6	160	32	160	80	48					\$54,190
2 Soil Mapping and Field Testing	0	0	0	0	24	0	0	584	269	252	0	\$98,870
2.1 Soils Mapping & Site Selections					4			80	45			\$10,730
2.2 Field Infiltration Testing and Sampling					10			224	224	252		\$61,990
2.3 Data Analysis for Soil Hydraulic Parameters					10			280				\$26,150
3 GSSHA Model Development	40	63	400	340	560	468	258	0	0	0	0	\$237,699
3.1 Setup Watershed Characteristics	4	5	120	30	160	100	42					\$49,555
3.2 Add 1-D Hydraulics (stream,culverts,detention basins,etc.)	8	12	120	32	80	8	160					\$46,964
3.3 Setup Storm Event Precipitation	6	6	80	18	80	20	40					\$28,620
3.4 Running and Troubleshooting Models	6	8	80	140	160	160	16					\$64,320
3.5 Model QA/QC	16	32		120	80	180						\$48,240
4 Snow Accumulation/Snowmelt Model Enhancements	2	8	160	0	120	80	131	0	0	0	0	\$52,795
4.1 Compile and Analyze SNOTEL Data			40			40	66					\$14,330
4.2 Develop Snow Model	2	8	120		120	40	65					\$38,465
5 GSSHA Model Calibration and Validation	16	0	120	180	200	240	0	0	0	0	0	\$85,460
5.1 Parameter Optimization along Truckee River and Tributaries			40	60	80	80						\$28,740
5.2 Model Troubleshooting/Validation			40	80	80	120						\$34,960
5.3 Gage Network Analysis	16		40	40	40	40						\$21,760
6 Regional Impact Storm Development	4	6	86	12	110	0	110	0	0	0	0	\$35,390
6.1 Analysis of Existing Data		2	12		40		60					\$10,890
6.2 Develop Hypothetical Impact Storms	3	3	62	10	45		50					\$19,790
6.3 Run Hypothetical Storm Models & Compare/Summarize Results	1	1	12	2	25							\$4,710
7 Model Development/Documentation Report (Technical TRFMP Model Manual)	20	31	114	0	105	40	0	0	0	0	54	\$40,630
7.1 Prepare Draft Report	12	19	90		80	24					32	\$29,057
7.2 Prepare Final Report	8	12	24		25	16					22	\$11,573
8 TRFMP Model Users Manual/Model Training	8	92	182	84	24	0	0	0	0	0	78	\$60,850
8.1 Develop TRFMP Model User's Manual	8	36	70	36	24						60	\$28,060
8.2 TRFMP Staff and Modeling Subcommittee Training (3-Day Course)		28	56	24							9	\$16,395
8.3 Engineering Community Training (3-Day Course)		28	56	24							9	\$16,395
9 Meetings and Presentations	80	80	149	0	12	0	0	0	0	0	56	\$52,680
9.1 Monthly Progress Meetings (13)	26	26	43								26	\$16,420
9.2 Modeling Subcommittee Meetings (6)	18	18	30		12						12	\$12,210
9.3 TAC Presentations (4)	20	20	48								12	\$14,280
9.4 Public Outreach Forums (2)	16	16	28								6	\$9,770
10 Project Management	40	80	100	0	0	0	0	0	0	0	45	\$36,475
10.1 Project Management and Reporting Activities	40	80	100								45	\$36,475
Totals	216	298	1482	668	1598	1350	623	584	269	252	171	\$875,160

Task Name	Start	Finish	Month											
			Nov '10	Dec '10	Jan '11	Feb '11	Mar '11	Apr '11	May '11	Jun '11	Jul '11	Aug '11	Sep '11	Oct '11
1. Data Collection and Compilation	Mon 11/1/10	Fri 1/28/11												
1.1. Data for Model Setup	Mon 11/1/10	Fri 1/7/11												
1.3. Data for Model Calibration and Validation	Mon 12/6/10	Fri 1/14/11												
1.7. Overland Flow Testing and Troubleshooting	Mon 12/6/10	Fri 1/28/11												
2. Soil Mapping and Field Testing	Mon 11/1/10	Thu 1/20/11												
2.1. Soils Mapping & Site Selections	Mon 11/1/10	Fri 11/19/10												
2.2. Field Infiltration Testing and Sampling	Mon 11/22/10	Fri 1/7/11												
2.4. Data Analysis for Soil Hydraulic Parameters	Mon 12/20/10	Thu 1/20/11												
3. GSSHA Model Development	Mon 1/31/11	Tue 7/26/11												
3.1. Setup Watershed Characteristics	Mon 2/7/11	Fri 4/22/11												
3.2. Add 1-D Hydraulics (stream, culverts, detention basins, etc.)	Mon 1/31/11	Mon 4/11/11												
3.3. Setup Storm Event Precipitation	Mon 2/14/11	Fri 3/25/11												
3.4. Running and Troubleshooting Models	Mon 4/11/11	Fri 6/17/11												
3.5. Model QA/QC	Mon 6/20/11	Tue 7/26/11												
4. Snow Accumulation/Snowmelt Model Enhancements	Mon 1/31/11	Fri 5/13/11												
4.1. Compile and analyze SNOTEL data	Mon 1/31/11	Tue 3/22/11												
4.2. Develop Snow Model	Wed 3/16/11	Fri 5/13/11												
5. GSSHA Model Calibration and Validation	Wed 7/27/11	Tue 9/13/11												
5.1. Parameter Optimization along Truckee River and Tributaries	Wed 7/27/11	Wed 8/31/11												
5.2. Model Troubleshooting/Validation	Wed 7/27/11	Tue 9/13/11												
5.3. Gage Network Analysis	Wed 7/27/11	Wed 8/24/11												
6. Regional Impact Storm Development	Mon 1/31/11	Fri 7/15/11												
6.1. Analysis of Existing Data	Mon 1/31/11	Fri 3/4/11												
6.2. Develop Hypothetical Impact Storms	Mon 3/7/11	Fri 4/22/11												
6.3. Run Hypothetical Storm Models and Compare/Summarize Results	Tue 5/24/11	Fri 7/15/11												
7. Model Development/Documentation Report (Technical TRFMP Model Manual)	Wed 9/14/11	Fri 11/25/11												
7.1. Prepare Draft Report	Wed 9/14/11	Thu 10/20/11												
7.2. Prepare Final Report	Fri 10/21/11	Fri 11/25/11												
8. TRFMP Model User's Manual/Model Training	Mon 8/1/11	Wed 11/9/11												
8.1. Develop TRFMP Model User's Manual	Mon 8/1/11	Fri 10/28/11												
8.2. TRFMP Staff and Modeling Subcommittee Training (3-day Course)	Mon 10/31/11	Wed 11/2/11												
8.3. Engineering Community Training (3-day Course)	Mon 11/7/11	Wed 11/9/11												
9. Meetings and Presentations	Tue 11/2/10	Mon 11/14/11												
9.1. Monthly Progress Meetings (13)	Tue 11/2/10	Tue 11/1/11												
9.2. Modeling Subcommittee Meetings (6)	Mon 12/13/10	Mon 10/3/11												
9.3. TAC Presentations (4)	Mon 2/7/11	Mon 10/24/11												
9.4. Public Outreach Forums (2)	Mon 10/31/11	Mon 11/14/11												
10. Project Management	Mon 11/1/10	Fri 11/25/11												
10.1. Project Management & Reporting Activities	Mon 11/1/10	Fri 11/25/11												

Project: Truckee River Watershed Regional Hydrologic Model
 Date: Thu 9/30/10

Task Progress
Summary External Tasks Deadline

Split Milestone Project Summary External Milestone



Attachment “A”

Scope of Services Virginia Street Bridge Replacement

Background

The Virginia Street Bridge is a historic structure in downtown Reno, crossing the Truckee River. The bridge was built in 1905 and is in the National Register of Historic Places for its innovative period design. Because of age, low structural integrity, and impact to flooding in downtown Reno, the City of Reno, U.S. Army Corp of Engineers (USACE), and other stakeholders are desirous to replace the bridge.

A previous study was completed in February 2009 entitled “TRAction Visioning Project.” This study identified and analyzed alternatives for six downtown bridges including the Virginia Street Bridge and associated level of flood protection desired by the community. Through this Visioning process, it was determined that replacement structures in the downtown should provide 100-year plus 2-feet of freeboard for flood protection. This is approximately analogous to 50 year with 4 feet of freeboard. Four feet of freeboard will meet minimum USACE freeboard criteria. This scope builds upon the previous study but will focus solely on Virginia Street bridge replacement options (center pier, clear span, and moveable bridge types), their associated aesthetic qualities, and their ability to meet flood protection requirements.

General Requirements:

The work consists of planning, stakeholder coordination, environmental clearance under NEPA, permitting, USACE Section 408 procedures, preliminary and final engineering, and construction management for the Virginia Street Bridge over the Truckee River in downtown Reno, Nevada. The project limits are anticipated to be from State Street north to West 2nd Street and from Sierra Street east to Center Street. Virginia Street (formerly SR 430) is owned by the City of Reno, and the bridge is inspected by NDOT. The U.S. Army Corp of Engineers will be the lead agency under NEPA.

The scope of this proposal encompasses “Stage 1” of a multi-stage process. Stage 1 focuses on assembling and coordinating the Design Review Committee and Stakeholder Working Group, developing a range of bridge type and aesthetic options, systematically screening those alternatives to identify a preferred alternative, data gathering, and visual simulation to support this process. Using a rigorous public and stakeholder process, the goal of Stage 1 is to identify a single bridge alternative for permitting, design, and development during Stage 2. Stage 2 will consist of preparation of the final PS&E package, permit applications, NEPA clearance, and Section 408 applications. Stage 3 will consist of construction management, oversight, and testing during construction of the bridge. Stage 2 and 3 will be scoped and executed under separate task order after completion of Stage 1 and are summarized as follows:

Stage 1 – included in this proposal for \$1,791,000:

- Concept Development – bridge type, aesthetics, urban design, and visualizations.
- Public Outreach – public information and outreach, stakeholder partnering, and visioning.
- Preliminary Engineering – Initial design to approximately 30%.
- Environmental - Initiation of NEPA, Section 106 consultation, USACE 408 process, and permitting.
- Hydraulic Modeling – Preliminary steady state modeling.

Stage 2 – to be included in a future proposal for an estimated fee of \$1.5 – \$3.0 Million*:

- Complete bridge PS&E package.
- Environmental - Completion of NEPA, USACE 408, and permit clearances.
- Hydraulic Modeling – Unsteady state modeling.
- Public Outreach

Stage 3 – to be included in a future proposal for an estimated fee of \$1.4 – \$3.2 Million*:

- Construction Administration
- Construction Inspection
- Permit Compliance and Closeout
- Public Outreach

* Upper range corresponds to moveable bridge options.

Standards and References:

Federal

- 40 CFR Parts 1500-1508 Regulations for Implementing the Procedural Provisions of NEPA.
- 49 CFR Part 633 Project Management Oversight
- 36 CFR Part 800 Protection of Historical and Cultural Properties (Section 106 process)
- 49 CFR Part 24 Uniform Relocation and Real Property Acquisition Regulations for Federal and Federally Assisted Programs

Roadway Design

- Standard Specifications for Public Works Construction (Orange Book) 2007
- City of Reno Construction Standard Details (Draft 2010)
- AASHTO Policy for Geometric Design of Highways and Streets 2004
- Manual on Uniform Traffic Control Devices 2010
- AASHTO Roadside Design Guide 2006
- Guide for the Planning, Design, and Operation of Pedestrian Facilities, AASHTO, 2004

Structural Design

- NDOT Bridge Design and Procedures Manual 2008
- AASHTO LRFD Bridge Design Specifications, Customary U.S. Units, 4th Edition

Hydrology & Hydraulics

- USACE Policies and Procedures
- Reno Public Works Manual
- Truckee Meadows Regional Hydrologic Design Manual

Software

- Microsoft Office, AutoCAD 2009, Synchro / SIMTraffic, GuideSign, Autoturn, HEC-RAS, ArcGIS 9.3.1, HEC-GeoRAS (version 4.2.93), SAP 2000, MDX, CONBOX, RC Pier

Task 1 – Project Management

The development and maintenance of effective communication and coordination among the project team, the City of Reno, and other entities and stakeholders will be one of the key factors in achieving the successful completion of the project. Jacobs will oversee and manage all activities as follows:

Project Management – The Jacobs Project Manager, in collaboration with the City Project Manager will be responsible for the ongoing project coordination of all activities and the contract for the duration of the scope. The Jacobs Project Manager will be responsible throughout the project for management and all communications, including billing, with the City Project Manager. Communications between the Jacobs Project Manager and the City will be through the City Project Manager unless otherwise directed. The Jacobs Project Manager shall also maintain direct communication, as appropriate, with other local, state, federal, and private stakeholders as required for the progress of the scope-of-work detailed in this document. All communications shall be documented and reported to the City Project Manager.

The Jacobs Project Manager and City Project Manager expect to meet on a biweekly basis, at a minimum, and more frequently as deemed necessary to coordinate team activities, review progress and budget, identify issues and identify actions needed to resolve those issues. The Jacobs Project Manager will coordinate with team leads to discuss the progress of the project and identify issues and action items to be addressed. The Jacobs Project Manager will maintain and distribute an Action Items Log identifying the person responsible for resolving each item and the expected date of completion. The Action Item Log will be reviewed at each Progress Meeting.

The Jacobs Project Manager is responsible for the contracting, coordination, and management of all subconsultants. The Jacobs Project Manager will be the primary point of contact for the City for all team subconsultants and will be responsible for communicating and coordinating the direction from the City to all team members.

Project Controls – Jacobs will assign staff to manage the project schedule, staffing plan, accounting structure, and associated updates. The project schedule will be a detailed,

graphic project schedule indicating tasks, subtasks, critical dates, milestones, deliverables, and review requirements. The project schedule will be in a format which depicts the order and interdependence of the various tasks, subtasks, milestones, and deliverables for each task identified herein. Progress will be reviewed monthly and should these reviews indicate a substantial change in progress, the schedule will then be reviewed at the project management team meetings.

The consultant will maintain a project staffing plan throughout the life of the contract. The staffing plan will document and forecast staff hours over time, by task and by individual. A project cost curve will graphically display the historical and forecasted expenditure by dollars in an earned value format. The cost curves will be submitted monthly with progress reports and consultant invoices.

PPM / File Management – Jacobs will develop and maintain the Project Procedures Manual and the project files (both electronic and hardcopy). Copies of all outgoing and incoming correspondence will be provided to the Jacobs Project Manager, or designee, on a continuing basis and distributed to the City Project Manager as needed. Word processing, data bases, spreadsheets, etc. will be prepared using a format compatible with Microsoft Office.

Quality Control – The Jacobs Project Manager is responsible for ensuring a comprehensive, independent quality review is done for each and every project deliverable. The detailed checking procedure will be outlined, and responsibilities assigned in the Project Procedures Manual.

Project Management Progress Meetings – The Project Management Progress (PMP) meetings are expected to be held biweekly throughout the project to coordinate scope, schedule, budget, as well as overall project progress and strategy. The PMP meetings will be held at the City of Reno offices on a regular date and time. At a minimum, the Jacobs Project Manager and the City Project Manager(s) will be in attendance. Participation from other team members will be as needed (assumed 50%) and via teleconference for remote staff. For each PMP meeting, Jacobs will prepare brief meeting minutes documenting discussion items, decisions, and action items.

Deliverables: Project Procedures Manual, Project File, Project Schedule, Project Cost Curves / Progress Reports, PMP Meeting Minutes

Task 1 Summary	
Firm	Task Total
Jacobs	\$153,673
Bridgescapes	\$33,750
Fluid Concepts	\$16,200
Kautz Environmental	\$7,000
Stacey Crowley Consulting	\$5,980
Klienfelder	-
Stantec	\$7,905

JBR (Includes WCRM)	\$35,040
Tampa Bay Engineering	-
Nieya	-
Task 1 Total	\$259,548

Task 2 – Public Outreach

Jacobs will provide comprehensive Public Information and Outreach Program services to the City for the development of the Virginia Street Bridge replacement. The following program is designed to provide timely and accurate distribution of project information to stakeholders and the general public utilizing and integrating existing City information techniques.

Public Outreach Management – By nature, public outreach is a fluid process, requiring reactions to unforeseen and unexpected external developments and inquiries. Jacobs will manage the ongoing support, responsiveness, and modification of the public outreach material, messaging, and support staff from initial inception through quarterly updates.

Public Involvement / Media Plan – In collaboration with the City of Reno Public Information Division, Jacobs will develop, document, and distribute a Public Involvement Plan outlining the specific tools to be implemented, responsibilities, and communication protocols. In addition, a specific media relations plan will be described detailing the process by which press inquiries and press releases will be handled.

Prepare Initial Project Materials – The Jacobs team will develop, design and update project collateral information for public use. Traditional collateral materials are assumed to include public meeting notices (including media advertising costs), a project fact sheet, a project newsletter updated quarterly, public meeting handouts, website, and 2 electronic media accounts.

Summary of Public Outreach – Jacobs will document the public outreach process for Stage 1, including a record of articles, press releases, comments, discussion and outcomes, meeting attendance, and collateral materials.

Deliverables: Public Involvement / Media Plan, Collateral Materials, Summary of Public Outreach.

Task 2 Summary	
Firm	Task Total
Jacobs	\$48,757
Bridgescapes	\$2,750
Fluid Concepts	\$1,650
Kautz Environmental	\$875
Stacey Crowley Consulting	\$910
Klienfelder	-

Stantec	\$775
JBR (Includes WCRM)	-
Tampa Bay Engineering	-
Nieya	\$1,000
Task 2 Total	\$56,717

Task 3 –Partnership & Visioning

Partnership & Visioning Plan – Jacobs will provide documentation outlining the Partnership process including workshops with the Stakeholder Working Group (SWG), Design Review Committee (DRC), City Council Subcommittee and full City Council, describing areas of responsibility, meeting goals, draft agendas, and methodologies. The SWG and DRC are further defined in this section.

Process Review Meeting – Jacobs team will attend and support the facilitation of a 2-hour meeting with SHPO, USACE, and cultural staff specifically to discuss and reach consensus on the Design Review Committee (DRC) and Partnership process. The DRC process is in accordance with the amended programmatic agreement between the USACE and SHPO for the Truckee River Flood Control Project.

Independent Facilitation – The Jacobs team will provide an independent facilitator for the Partnership workshops that include the DRC workshops, joint DRC and SWG workshops, and City Council Subcommittee workshop. This neutral facilitation, guidance, and support will direct the workshop participants through the design process and lead to a single bridge design to bring to the full City Council for approval. Facilitation includes planning and agenda development for each workshop, moderating and organization during the workshops, and review of workshop documentation. A total of 6 workshops are anticipated for facilitation.

Historical Outreach – Historical outreach will include written materials and presentations at the scheduled meetings intended to educate the public and stakeholders about the federal preservation laws and the historic preservation principles that will be followed throughout the bridge design process. The process will also include the development of a design matrix of project effects based on the historical and architectural context of the APE, through discussions with the SHPO and the DRC. The matrix will establish a means to evaluate each of the bridge designs against the requirements of the Programmatic Agreement between the SHPO and the USACE.

Downtown Interests Outreach – Jacobs and the project team shall communicate with several downtown advocacy groups to communicate visioning, project progress, and timelines. Groups to be contacted include but may not be limited to: the Downtown Improvement Association, Reno/Sparks Chamber of Commerce, the Northern Nevada Network (NNN), Neighborhood Advisory Boards, and homeowners associations. Efforts will be made to coordinate consolidated meetings of these groups so as to distill the

information distribution, but it is anticipated that update presentations at regularly scheduled membership meetings will be performed.

Design Review Committee (DRC) – The DRC is comprised of historic consulting parties and associated interest groups as described in the 2009 USACE / SHPO Programmatic Agreement. DRC participants include but are not limited to SHPO, USACE, UNR Historic Preservation Program, National Trust for Historic Preservation, Preserve Nevada, and the Historic Reno Preservation Society. Jacobs will prepare, circulate for internal review, and distribute letters to potential consulting party member agencies for inclusion in the DRC. The roster of potential consulting parties will be coordinated with the USACE and SHPO.

The DRC will meet in a series of 4-hour workshops to review and progress historic effects, bridge type and aesthetics, and mitigations. The goals of the DRC workshops would be to develop a range of bridge alternatives that are consistent with the local context and parameters as determined by the DRC. It is anticipated that several workshops will be necessary to narrow the bridge alternatives to several structure types, forms and aesthetic treatments. A total of three workshops are assumed in the base fee with two additional in the contingency for Task 3.

Stakeholder Working Group (SWG) – The SWG is comprised of various groups and agencies that have specific interests in downtown, area resources, and associated agency perspectives. Examples of SWG participants include but are not limited to City of Reno Redevelopment Agency, City of Reno Arts and Culture Commission, Pyramid Lake Paiute Tribe, Washoe RTC, Nevada Division of State Lands, and U.S. Fish and Wildlife Service. Jacobs will develop the SWG roster and contact information, develop a standard contact letter/email, contact each proposed member, confirm participation, and identify meeting schedule constraints.

The SWG will meet in a series of 4-hour workshops to provide input on project progress, bridge type and aesthetics, and mitigations. The goals of the SWG workshops would be to develop a range of bridge alternatives that are consistent with the local context and parameters as determined by the DRC. It is anticipated that several workshops will be necessary to narrow the bridge alternatives to several structure types, forms and aesthetic treatments. A total of three workshops are assumed in the base fee, one of which may be combined with the DRC workshop. One additional meeting is included in the contingency for Task 3.

One-on-One Meetings with Stakeholders – It is assumed that certain interest groups, individuals, and/or public officials may request specific meetings to discuss project issues, concerns, and/or provide input to the project or process. These groups include the affected Neighborhood Advisory Boards (NABs), various downtown interest groups, and/or interested parties. The Jacobs team will attend individual one-on-one meetings with these groups during the course of Stage 1. The specific need, number, and nature of these meetings will be dynamic and as necessary; however, ten meetings are assumed in the base fee with another six included in the contingency for Task 3.

Public Meetings – Jacobs will plan, schedule, organize, notice, and facilitate public meetings during Stage 1 to solicit public input on the alternatives generated and the project process. City owned facilities will be used. The meetings will be noticed according to NEPA requirements as set forth by the USACE. Noticing is assumed in two area newspapers, three times each (30 days prior, 5 days before, and day of). Meeting materials will be prepared including sign-in and comment sheets, handouts, display boards, and visualizations. This task includes collecting and responding to comments. One public meeting is assumed in the base fee and another one meeting included in the contingency for Task 3.

City Council Presentations - Jacobs will plan, attend, prepare a Powerpoint presentation, and present at regular Reno City Council Meetings. The presentations will depict the process, participation, alternatives considered and final recommendation for Council action. In addition, Jacobs will plan, organize, notice, attend, facilitate, and document a 4-hour meeting of the appointed City Council Subcommittee to review the final alternatives. Two City Council presentations are assumed in the base fee with another one presentation in the contingency for Task 3.

Prepare Concepts & Visualizations – Based on the results and direction of DRC and SWG workshops Jacobs will prepare a range of alternatives that are consistent with the context and parameters developed and which addresses all of the suggested alternatives from the workshops and input to date. The concepts will consist of a range in both structure type (center pier, clear span, and moveable) and associated aesthetics.

Visualizations will be prepared to depict the concepts in a rendered, 3D virtual-world format. This format provides for both still renderings and fly-thru / pedestrian “walking” animations. Both the aesthetics of the alternatives and impacts to surrounding infrastructure will be conveyed. Non-photo renderings may also be produced for the final, detailed alternatives. It is acknowledged that the concept development and modification process is iterative and dynamic based on project progress and stakeholder input. However, an initial total of 8-10 alternatives are assumed.

Concepts and visualizations will be prepared for a total of three workshops in the base fee with one additional in the contingency for Task 3.

VSB Partnership Summary – Jacobs will provide documentation of each of the DRC, SWG, one-on-one, public, and City Council Subcommittee meetings, materials reviewed, alternatives considered, minutes, and results.

Deliverables: Partnership & Visioning Plan, VSB Partnership Summary (including final bridge recommendation)

Task 3 Summary		
Firm	Base Fee	Contingency
Jacobs	\$146,248	\$71,438

Bridgescapes	\$69,250	\$22,750
Fluid Concepts	\$34,350	\$13,050
Kautz Environmental	\$15,250	\$8,875
Stacey Crowley Consulting	\$13,260	\$11,570
Klienfelder	-	-
Stantec	\$31,290	\$9,019
JBR (Includes WCRM)	\$31,857	\$8,883
Tampa Bay Engineering	-	-
Nieya	-	-
Task 3 Total	\$341,505	\$145,585

Task 4 – Preliminary Engineering

Data Collection – As-Builts & Existing Plans – Jacobs will obtain as-builts for Virginia Street, adjacent roadways including sidewalk and existing building entrances and windows (Mill Street, 1st Street, Center Street, and Sierra Street), the Virginia and Center Street bridges, bridge inspection reports for Virginia Street, existing plans for the Post Office Plaza and other redevelopment projects, the Riverwalk, 10 North Virginia Plaza/ice rink, and other readily available and pertinent data such as assessor’s maps, parcel maps, drainage studies, and geotechnical reports. This data may be available from the City of Reno and NDOT.

Data Collection – Utilities & Potholing – Jacobs will obtain existing utility information from City of Reno sources and by contacting utility companies. A basemap of the project location and anticipated footprint will be developed for distribution with utility letters. Utility investigation includes potholing utilities in the footprint of the future bridge abutment locations and critical roadway reprofiling locations. A total of 25 potholes are assumed. Jacobs will engage the services of a contractor who is licensed and bonded to work in the City of Reno right-of-way. The Jacobs team will pay permit and asphalt patch fees as required by the permit. A master utility CADD file will be developed.

Surveying, Right-of-Way, and River Profiling – Establish and tie in existing control in the horizontal and vertical datum required by the City and physically perform a design ground survey in the project area from (and including) the first street intersection to (and including) the Mill Street intersection from building to building along Virginia Street. Roadway cross sections will be surveyed at intervals necessary to complete final design and to the nearest building behind the back of sidewalk. The ground survey will extend along River Walk and Truckee River Lane 100 feet from the edge of the bridge and includes the parking area adjoining the post office building. The Riverwalk and facilities parallel to the river will be surveyed at an approximate 25 foot interval from the water’s edge to the nearest building behind the sidewalk. In addition, the riverbed profile will be surveyed using standard cross-sections for a distance of approximately 300’ upstream and downstream of the existing bridge. Aerial mapping will supplement the ground survey to support design. The aerial mapping area includes Virginia Street from State Street to between West 1st Street and West 2nd Street and east/west to Sierra, Center and Lake Streets. This includes full ortho-rectified and one foot contour topographic mapping of

all features within this footprint. In the area of the ground topo, Right-of-Way will be established for use in plan drawings. Post Construction setting of centerline monuments and Record of Survey is not included.

Geotechnical – Geotechnical investigation includes physical testing and sampling to support bridge foundation design, scour analysis, environmental, retaining wall / floodwall design, and pavement design. The details of the geotechnical investigation is as follows:

Review of Available Literature - Prior to our field exploration, we will review the information provided in geologic and soils references and as-builts. The minimum drilling distance from the existing bridge will be determined.

Field Investigation - The subsurface exploration will consist of one boring at each bridge abutment up to 100 feet depth or refusal, whichever comes first, (2 borings total), and four 5-foot-deep borings to explore the roadway and shallow fill for the proposed re-profiling of the roadway. Two of the shallow borings will be advanced 30 to 40 feet beyond the bridge abutments, and the other two shallow borings will be advanced on Virginia Street approximately 200 to 300 feet north and south of the bridge. The final field exploration locations will be selected based on the background information, the anticipated project layout, utility locations, site access, and input from the City of Reno.

A traffic and pedestrian control plan will be prepared and an encroachment permit will be obtained from the City of Reno. All boring locations will be marked with white paint and Underground Service Alert (USA) will be notified a minimum of 48 hours prior to exploration activities. Due to the anticipated congested nature of the underground utilities, we will also subcontract an independent utility locator to provide additional underground utility location services. We have assumed that the City of Reno will require drilling at night only, and City festivals and events will be avoided. Detours may be necessary due to single laneage in each direction.

Jacobs will investigate the project site by drilling soil borings using a sonic drill rig. In addition, we propose to perform Standard Penetration Testing at approximately 5-foot intervals throughout the depth of the borehole, except in depth intervals where the coring would indicate practical refusal of the smaller SPT sampler. The samples will be retained for review by designers and/or potential contractors.

The borings will be logged by a field engineer or geologist who will obtain “cored” and driven samples for further laboratory testing. Planned in-situ testing methods include standard penetration tests driven at approximately 5-foot intervals, and soil strength testing using a torvane or pocket penetrometer device where possible. Each deeper boring will take approximately 1-1/2 days to complete, so that a temporary cover will be placed over the borehole between the first and second day of drilling. Upon completion, soil borings will be backfilled with cement grout to the ground surface and capped with a concrete patch. Overall, field exploration is expected to take approximately four nights.

The work scope is based upon the assumption that the site is accessible to the exploration equipment proposed and suitable areas can be identified that are clear of utilities.

In addition, we propose to perform a seismic micro-refraction survey, to obtain seismic shear wave velocity profile for the top 100 feet of the site. In situ stiffness of the soil deposits for lateral pile analysis will be measured.

Environmental Sampling - Based on field measurements using a photo-ionization detector (PID) up to one soil sample per shallow boring, and two soil samples per deep boring (total eight soil samples) may be submitted for laboratory analysis. Laboratory analysis will include total petroleum hydrocarbons in the oil (TPH-ORO), diesel (TPH-DRO) and gasoline (TPH-GRO) ranges by EPA method SW8015, volatile organic compounds by EPA Method SW8260B and 17 metals by EPA Method 6020.

We have assumed that there will be relatively little quantity of drilling cuttings or displaced water, and have assumed disposal of approximately 10 drums of non-contaminated soil and/or groundwater.

Laboratory Testing - We anticipate the laboratory-testing program will consist of 10 to 12 tests for soil classification (moisture content, gradation, and plasticity), 3 direct shear strength (with compaction curves), and 4 R-value, and unit weight/moisture content. In addition, we will contract with an outside analytical laboratory to perform three sets of pH, resistivity, and soluble sulfate testing of selected soil samples to be used in evaluating concrete reactivity and corrosion potential.

Analysis and Report - Based on the results of our field exploration and laboratory testing, we will provide preliminary design recommendations regarding the following:

The preliminary design recommendations will be presented in a preliminary and final project geotechnical report complete with logs of the borings and laboratory test results (completed in State 1). This investigation excludes a site-specific evaluation of seismicity, faulting, or other geologic hazards.

Jacobs and its subconsultants assume no liability for any pre-existing environmental contamination or hazardous materials or claims associated with its discovery.

Baseline Structure Type Analysis – Preliminary engineering analysis regarding foundation location types, bridge type options and associated structural appurtenances, and structural engineering considerations to support the beginning of the alternatives process.

Roadway Geometry Establishment – Establish the existing roadway centerline, horizontal, and vertical geometry in AUTOCAD format. The new geometry will be based on AASHTO Green Book criteria. Develop a basemap file for the surrounding infrastructure including topographic data and key features such as pedestrian facilities, buildings locations, building entry/exits, driveways, utilities, and existing sections.

Develop new roadway geometry based on changes in bridge profiles. Tie in surrounding infrastructure to the new roadway geometry utilizing ADA criteria.

Hydraulic Model & Unsteady Flow Analysis – Jacobs will refine existing HEC-RAS hydraulic models for the Truckee River through the downtown Reno area to support: the development and screening of potential bridge design alternatives, the selection of a preferred alternative, and the ultimate design of this alternative.

A “steady” state hydraulic model (steady model) will be assembled and calibrated, and will primarily be used to assist in the selection of the preferred bridge design alternative. All of this work is included in Stage 1.

An “unsteady” state hydraulic model (unsteady model) will also be developed and calibrated, and used to facilitate the hydraulic design of the preferred alternative. Only the development and calibration activities are included in Stage 1.

Steady Model Development - The hydraulic model developed for the Truckee River during the City’s TRAction Visioning Project will serve as the base hydraulic model for this project. This base hydraulic model will be reviewed and updated with new, additional survey and other appropriate data; and the limits of the base hydraulic model will be extended.

The USACE has developed hydraulic models for the Truckee River that extend beyond the limits of either the base hydraulic model or the proposed steady model. Data will be extracted from these USACE models to support the development of the proposed steady and unsteady models.

The upstream end of the proposed extension to the hydraulic model limits will be established at the USACE-hydraulic-model cross section located approximately 1500’ upstream from the Arlington Ave Bridge. The downstream end of the proposed extension to the hydraulic model limits will be established at the USACE-hydraulic-model cross section located at about 700’ - 800’ downstream from the Wells Ave Bridge.

The steady model will cover about 1.25 miles of the Truckee River through downtown Reno, and the geometric data within this reach will be updated. However, the downstream model analysis limit will be further extended about 0.5 mile to the Reno gage, per a Washoe County staff recommendation. The portion of the existing USACE hydraulic model between the Reno gage and the steady model’s downstream limit will then be integrated into the steady model, will be used “as-is,” and will not be modified.

The updated geometric data will be obtained from the merger of new and existing channel survey data with the existing downtown Reno floodplain survey data to create single, continuous DTM and TIN models. Additional survey shots within the floodplain area, outside of the channel banks, will be obtained, as needed, to facilitate developing “smooth” transitions between the separate channel and floodplain data sets.

The new TIN model (or models) will be imported into ArcGIS for processing via the HEC-GeoRAS extension. The new geometry developed by HEC-GeoRAS and imported into HEC-RAS will essentially convert the base hydraulic model to this project's steady model. Jacobs proposes to use ArcGIS 9.3.1 and the corresponding version of HEC-GeoRAS (version 4.2.93) for generating the updated cross section data for the steady model. HEC-RAS 4.1 will be used for the actual modeling.

Existing as-builts or new survey data will be used to confirm or define the existing bridges and other river structures/features to be included in the 1.25-mile steady model.

Jacobs will coordinate with the USACE at key milestones during the development of the steady and unsteady models, to ensure that debris considerations and other modeling assumptions are consistent with USACE preferences. It is assumed: the USACE hydraulic models include both steady-state and unsteady-state versions that are readily available, the boundary conditions at the upstream steady model limit are readily available peak flows and WSELs (for the steady model) or flow hydrographs and WSELs (for the unsteady model), the boundary conditions at the downstream steady model analysis limit at the Reno gage are readily available water surface elevations, and the hydrologic data contained in the current USACE hydraulic models is to be used to define all steady and unsteady model flows without change.

The electronic versions of the 2007-2008 Washoe County aerial maps, to be provided by the City, will be used as a data source to support the steady model development. FEMA modeling or other activities associated with analyzing or assessing any FEMA data or impacts will not be required during Stage 1, and two-dimensional flow modeling will also not be required for this project.

Steady Model Calibration - The steady model will be calibrated using both the 1997 flood event data used for the calibration of the current USACE hydraulic models, as well as the 2005 flood event data used for the calibration of the base hydraulic model. Modifications will be made to Manning roughness and/or other head loss coefficients to make necessary adjustments to computed water surface elevations. The final calibration adjustments will be skewed toward replication of the 1997 flood event data if/where conflicts or inconsistencies within or between data sets are identified.

Initial Concept Analysis – The calibrated steady model will be used to help determine the feasibility of conceptual Virginia St Bridge design alternatives, to support of the Partnership Workshop 2. As many as 8-10 concepts may be analyzed to estimate the associated 100-year (only) Truckee River flood impacts each concept may create on the surrounding infrastructure. Each different bridge design alternative will be analyzed for the “worst” hydraulic case (i.e., all other bridges assumed to be in the existing condition), and for the “best” hydraulic case (i.e., the Arlington Ave, Sierra St, Center St and Lake St Bridges assumed to be improved to the “Visioning” condition).

Advanced Concept Analysis – The calibrated steady model will also be used to help determine the effectiveness of selected conceptual Virginia St Bridge design alternatives

in reducing water surface elevations during the design flood. This effort is in support of the Partnership Workshop 3. As many as four concepts will be further analyzed to estimate the associated 100-year (only) Truckee River flood impacts each concept may create on the surrounding infrastructure. Each different bridge design alternative will be analyzed for five potential scenarios: Virginia St Bridge improvements only, previous scenario plus Lake St improvements, previous scenario plus Center St improvements, previous scenario plus Sierra St improvements, and previous scenario plus Arlington Ave improvements.

Unsteady Model Development and Calibration - The unsteady model will be developed and calibrated, and will then be used to confirm the steady model results for the Preferred Alternative.

The “uncalibrated” steady model will serve as the base hydraulic model for this activity. Appropriate adjustments will then be made to convert the steady model to the unsteady model.

The unsteady model will be calibrated using only the 1997 flood event data used for the calibration of the current USACE hydraulic models. The initial calibration run for the unsteady model will incorporate the final calibration parameters identified for the current USACE hydraulic models, for the “downtown Reno reach.” Adjustments will then be made to Manning roughness and/or other head loss coefficients to complete the unsteady model calibration.

Once calibrated, the unsteady model will be used to preliminarily assess the 100-year (only) floodplain impacts associated with the Preferred Virginia St Bridge Design Alternative, considering that only the Virginia St Bridge is improved. These results are expected to then show that the steady model screening results were conservative.

A Technical Memorandum will be provided for review and comment by the City at each of the following milestones: prior to the finalization of the Steady Model Calibration, prior to the finalization of the Initial Concept Analysis, prior to the finalization of the Advanced Concept Analysis, prior to the finalization of the Unsteady Model Calibration, and prior to the finalization of the Unsteady Model Stage 1 Application. Additionally, these Technical Memoranda will be consolidated into the final deliverable for all Stage 1 work.

Landscape & Aesthetics – Development and coordination of urban design features with the goal of integrating the bridge into the surrounding existing and future context. This work includes analysis and design retrofit of existing adjacent properties affected by the bridge and street modifications including the 10 North Virginia Ice Rink Plaza, the existing and future Post Office, the Riverside Hotel and Riverwalk, and the Masonic Building block. Design components which will be addressed include sidewalk paving patterning, sidewalk grading, ramps, steps, railings, tree grates, trash containers, decorative lighting, planters and planter walls, trees and landscaping.

Pedestrian pathways across Virginia Street and along the river will be designed and/or retrofitted for special paving, lighting and landscaping.

Public art will be addressed for inclusion into the project and will be coordinated with the City of Reno Public Art representative. Funding will be studied and the type of public art that could be incorporated into the design of the bridge project area will be considered and brought to the design team and stakeholder process for review.

A total of three workshops are assumed to require development of landscape and aesthetics in the base fee, with two additional in the contingency for Task 4.

Initial Concept Analysis – Refine engineering analysis to determine feasibility and effectiveness of conceptual alternatives. 8-10 concepts will be analyzed for impacts to the surrounding infrastructure. Structural design, cost, aesthetics and roadway geometrics will be analyzed.

Advanced Concept Analysis – Refine engineering analysis to determine feasibility and effectiveness of conceptual alternatives. Concepts will be analyzed for impacts to the surrounding infrastructure. Structural design, cost, aesthetics and roadway geometrics will be analyzed.

Traffic Engineering, MOT, & Transit – Jacobs will review existing traffic data from available sources (no traffic counts to be collected) and develop a conceptual traffic control scheme for construction. Input from the City of Reno and the RTC will be used to develop the MOT. Special events will be considered and the City of Reno special events coordinator will be contacted. In addition, one meeting will be held with RTC to coordinate planned future light rail and transit considerations. It is assumed that some form of light rail will be accommodated across the Virginia Street Bridge. It is also assumed that parking will be removed from the bridge.

Constructability Review – Jacobs will review the final project alternative for constructability. The review will be completed by a professional construction manager. A review meeting will be held with city, roadway, bridge, and permitting staff to discuss and detail the anticipated construction sequence. Risk areas and constraints will be identified and documented. A report will be developed summarizing the results of the constructability review.

Cost Estimating – Jacobs will prepare a standard cost estimating spreadsheet that identifies the major project bid items. Cost estimates will be prepared to support Workshops 2-5 of the partnership process. The cost estimates will increase in detail as the process develops; however, focus will be on major bid items and factors for project soft costs. Long term maintenance costs and costs of all components of the bridge replacement including street transitions, floodwalls replacement, traffic, modifications of surrounding properties and/or accesses, and sidewalks will be included.

CEVP & Risk Analysis – Jacobs will prepare, facilitate, and document a cost estimating and risk workshop for the recommended alternative. This process will be attended by city, roadway, bridge, construction management and permitting staff. The team will review initial cost information, identify project risk factors and likelihoods, and generate a range of likely risk-based project costs in accordance with Cost Estimate Validation Process (CEVP) standard practices. A report will be prepared summarizing the findings of the analysis.

Final Refined Alternative Analysis - Refine the engineering analysis of the final alternative. This effort is in support of later partnership workshops. The concept(s) will be further detailed for impacts to the surrounding infrastructure. Structural design, cost, aesthetics and roadway geometrics will be analyzed. This effort is included in the contingency for Task 4 should additional workshops and related refinement be necessary.

Preliminary Roadway & Bridge Plans – Based on the recommended alternative, Jacobs will develop preliminary plans at a 1”=20’ scale in AUTOCAD format. Geometric information will be displayed along with initial pedestrian and driveway accommodation limits. The plans will be detailed and annotated according to City of Reno and NDOT standards as appropriate for approximately a 30-percent level of completion. Bridge sheets will show plan and elevation as well as the typical section and notes. Roadway sheets will depict removal of existing concrete and asphalt, horizontal geometry of Virginia street and pedestrian facilities, including the addition of a pedestrian walkway between the Riverwalk and the Post Office, business access, typical sections, vertical profile information, existing utilities and drainage facilities, as well as preliminary signing and striping. The preliminary plans will consist of the following sheets:

Sheet
Cover Sheet
Typical Sections
Horizontal Control
Removals
Plan / Profiles
Utilities
Signing / Striping
Details
Bridge Plan / Elevation
Bridge Typical Section
Bridge Notes

Alternatives Development Summary – Jacobs will document the preliminary engineering analysis, results, and alternatives comparison of the final bridge alternatives. This includes back-up data such as flood model print-outs, cost estimates, and reduced plansheets.

Deliverables: Topographic Survey (electronic), Preliminary / Final Geotechnical Report, Flood Modeling Technical Memoranda, Constructability Report, CEVP / Risk Analysis Report, Cost Estimates, 30% Bridge / 30% Roadway Plansheets, Alternatives Development Summary.

Task 4 Summary		
Firm	Base Fee	Contingency
Jacobs	\$450,946	\$34,373
Bridgescapes	\$19,000	\$2,000
Fluid Concepts	\$18,300	\$1,200
Kautz Environmental	-	-
Stacey Crowley Consulting	\$780	-
Klienfelder	\$103,700	-
Stantec	\$7,188	\$804
JBR (Includes WCRM)	-	-
Tampa Bay Engineering	\$20,000	-
Nieya	-	-
Task 4 Total	\$619,914	\$38,377

Task 5 – Environmental & Permits

Preliminary Environmental & Permitting Plan – Summary of the required permits, level of development required to submit, responsible agency / staff, and integration of the USACE 408 process. Efforts will be made to coordinate with USACE to facilitate timelines and the processing of the permit documents.

Section 106 Consultation – The Jacobs team will lead the efforts of the Section 106 consultation process as directed by and on behalf of the USACE. This support includes review and comment on correspondence and survey data, development of the APE, and attendance at coordination meetings with SHPO, the DRC, and major historic interest groups.

Pre-Application Meeting – Preparation, attendance, and documentation for the Section 404 pre-application meeting with the USACE. As needed, the project team shall prepare public notices and agency communication to facilitate and assist USACE staff.

Miscellaneous Permit Support – Initial support and coordination of early permit activities and application preparation. This shall consist of the collection of existing data, evaluation of relevant permit parameters, and support of the development of technical documents to support permit pursuit.

Exclusions: This scope and Stage 1 do not include completion, application, or receipt of any regulatory permits. All final permit applications will be prepared during future work phases.

National Environmental Policy Act (NEPA) – The Jacobs team will lead the NEPA process on behalf of and as directed by the USACE to support an ultimate NEPA document (Environmental Assessment) in later Stages. This includes noticing, field surveys, agency coordination, review of documentation, preparation of exhibits, alternative documentation, and design coordination of project components and potential impacts.

Initiate Work Towards NEPA EA Document –The Jacobs team will prepare an Environmental Assessment for submittal to and approval by the USACE during Stage 2. Stage 1 includes preparatory efforts to support the future EA. These tasks include:

- Public and Agency Scoping
- Information Consultation USFWS, NDOW, NNHP
- Formal Consultation USFWS, *Biological Assessment* Preparation
- Baseline Resource Surveys – Species and Wetlands

In conjunction with this task, the Jacobs team will perform biological field surveys (as necessary) and prepare a *Biological Assessment*. This task also includes performing cultural resources research and analysis to identify and determine the effects of the bridge project on historic properties within the Area of Potential Effect (APE).

This work will include attending up to three meetings at the Sacramento USACE and local Reno regulatory offices.

Initiate Work on the Section 106 Process – The Jacobs team proposes the following tasks to support the initiation of Section 106 consultation:

- Review of the existing Historic American Buildings Survey (HABS) and the Historic American Engineering Record (HAER) recordation of the Virginia Street Bridge and consult with SHPO.
- Update the Architectural Inventory

Exclusions: This scope and Stage 1 do not include final completion of any environmental or decision documents.

Deliverables: Preliminary Environmental & Permitting Plan, Biological Assessment

Task 5 Summary	
Firm	Task Total
Jacobs	\$9,952
Bridgescapes	\$4,000
Fluid Concepts	\$33,300
Kautz Environmental	\$5,000
Stacey Crowley Consulting	-
Klienfelder	-

Stantec	\$930
JBR (Includes WCRM)	\$80,000
Tampa Bay Engineering	-
Nieya	-
Task Total	\$133,182

Summary of Fees by Task

Task Summary		
Task	Base Fee	Contingency
Task 1 – Project Management	\$259,548	-
Task 2 – Public Outreach	\$56,717	-
Task 3 –Partnership & Visioning	\$341,505	\$145,585
Task 4 – Preliminary Engineering	\$619,914	\$38,377
Task 5 – Environmental & Permits	\$133,182	-
Subtotal	\$1,410,866	\$183,962
Direct Expenses		\$55,160
Special Services 10%		\$141,086
Total (rounded)		\$1,791,000

FEE SCHEDULE

<u>CLASSIFICATION</u>	<u>HOURLY RATE</u>
Principle in Charge	\$230 - \$260
Senior Project Manager	\$220 - \$240
Senior Construction Manager	\$235 - \$275
Construction Manager	\$125 - \$175
Senior Bridge Engineer	\$200 - \$220
Senior Survey Manager	\$270 - \$290
Senior Engineer	\$180 - \$210
Survey Crew	\$170 - \$200
Project Engineer III	\$140 - \$180
Project Engineer II	\$110 - \$140
Project Engineer I	\$90 - \$110
Staff Engineer	\$70 - 100
Public Information Manager	\$185 - \$205
Public Information Specialist	\$90 - \$110
Graphic Artist	\$70 - \$90
Project Controls	\$75 - \$125
Administrative Assistant	\$55 - \$75

Notes:

1. Overtime at 1.5 times hourly when 40 hour week exceeded for non-exempt staff.
2. Expenses at cost.
3. Per Diem at \$150 per day.



FLOOD PROJECT COORDINATING COMMITTEE

**NOTICE OF MEETING
AND
DRAFT AGENDA**

FRIDAY – OCTOBER 8, 2010 – 8:30 A.M.

**Washoe County Commission Chambers
1st Floor of Building A
1001 East Ninth Street, Reno, Nevada**

Voting Members

Ron Smith, Chair
Dan Gustin, Vice-Chair
Robert Cashell
Robert Dickens
David Humke
Bob Larkin
Geno Martini
Ron Zurek

Non-Voting Members

Shaun Carey	Burnham Moffat
Franco Crivelli	Jill Olsen
Jeff Cronk	Dean Schultz
Donna Dreska	Dan St. John
John Flansberg	Wayne Seidel
John Jackson	John Sherman
Dennis Miller	Katy Simon

Pursuant to NRS 241.020, this notice has been posted at the following locations:

Washoe County Administration, 1001 East Ninth Street, Reno, Nevada
Sparks City Hall, City Clerk, 431 Prater Way, Sparks, Nevada
Reno City Hall, City Clerk, One East First Street, Reno, Nevada
Truckee River Flood Project Office, 9390 Gateway Drive, Reno, Nevada
Truckee River Flood Project Website: <http://truckeefflood.us> (Click Committees, then Meeting Agendas or go to <http://truckeefflood.us/140/meeting.agendas.html>)

PUBLIC COMMENT: In order to conduct orderly, efficient, effective and dignified meetings that promote a governmental purpose with a governmental process, public comment may address any agenda item or other public issue that the Flood Project Coordinating Committee has the authority to effectuate or exercise control over. Public comment on matters beyond the Flood Project Coordinating Committee's scope of authority is not relevant to the Committee's business, does not invoke a governmental process nor serve a governmental purpose, and is contrary to the effective, efficient and orderly business conducted by the Committee. Each person addressing the Flood Project Coordinating Committee shall fill out a request to speak form, step up to the microphone when called, give his/her name, and limit the time of his/her presentation to three (3) minutes. All public comment remarks shall be addressed to the Committee as a body, and not to any member thereof. No person, other than members of the Committee and the person having the floor shall be permitted to enter into any discussion, either directly or through members of the Committee. No questions shall be asked of the Committee members except through the presiding officer. The Committee reserves the right to determine during its meeting, through a vote of its members, whether to allow additional public comment, limited to one (1) minute per person, on specified individual items on the agenda.

NOTES: Items on the agenda may be considered in an order different than they appear on the agenda. Unless otherwise indicated by an asterisk (*), all items on the agenda are action items upon which the Flood Project Coordinating Committee may act. The meeting facility is accessible to the disabled. Persons with disabilities who require special accommodations or assistance (e.g. sign language, interpreters or assisted listening devices) at the meeting should notify Flood Project staff at 850-7429, forty-eight (48) hours before the meeting.

1. **CALL TO ORDER, ROLL CALL, AND PLEDGE OF ALLEGIANCE** – Determination of a Quorum

2. ***ANNOUNCEMENTS**

3. ***PUBLIC COMMENT** – For all items on or off the agenda, limited to 3 minutes per person

4. **MINUTES**

A. **Approve Provisional Minutes of FPCC meeting of September 10, 2010.**

*B. **FOR INFORMATIONAL PURPOSES ONLY – Review Provisional Minutes of Finance Subcommittee Meeting of September 9, 2010.**

5. **FINANCE SUBCOMMITTEE ITEMS**

A. **CARMEN GROUP / LOBBYIST UPDATE**

Mimi Fujii-Strickler, Administrative Services Manager, Truckee River Flood Project

Update on lobbyists' activities. Possible action to accept the report and/or provide direction to staff on related lobbying matters.

B. **REVIEW PROPOSED FLOOD PROJECT COOPERATIVE AGREEMENT (JPA)**

Naomi Duerr, Director, Truckee River Flood Project

Greg Salter, Deputy District Attorney

Report on recent meetings, developments, proposals, and timelines of a new Interlocal Cooperative Agreement for the Truckee River Flood Management Project. Possible action to provide instructions to staff or recommendations to the Flood Project Coordinating Committee (FPCC) regarding the contents of the draft Cooperative Agreement regarding membership, governance, administration, and regulatory powers of the proposed Joint Powers Authority; the acquisition of land and the construction, ownership, operation and maintenance of flood facilities; the assessment and collection of rates and fees to pay for the project; the financing of the project; and the rights and obligations of parties to the Cooperative Agreement.

C. **AMENDMENT TO THE FCS GROUP, INC. CONTRACT (ESTABLISHMENT OF FEES FOR FLOOD PROJECT) TO ADD TO SCOPE OF WORK AND INCREASE BUDGET BY \$250,000**

Lisa Gianoli, Consultant, Truckee River Flood Project

Discussion of an amendment to the current contract with FCS Group regarding provision of consulting services and preparation of reports to be used in establishing revenue requirements of, and the rates and fees to be collected for, the financing of the Flood Project, to add to the scope of services and increase the amount of the agreement by \$250,000, from \$975,000 to \$1,225,000. Possible action to recommend approval of the amendment to the FPCC.

D. PHASE II HYDROLOGIC MODEL CONTRACT WITH MANHARD ENGINEERING IN AN AMOUNT NOT-TO-EXCEED \$900,000

Paul Urban, Flood Project Manager, Truckee River Flood Project

Discussion regarding a contract with Manhard Engineering in an amount not-to-exceed \$900,000 for development of Phase II of a Regional Hydrologic Model (application of the model to the entire watershed). Possible action to recommend approval of the agreement to FPCC.

E. TRACTION PROJECT AGREEMENT WITH THE CITY OF RENO FOR VISIONING AND ENGINEERING DESIGN SERVICES (30%) FOR THE VIRGINIA STREET BRIDGE TRACTION PROJECT IN AN AMOUNT NOT-TO-EXCEED \$1.8 MILLION

Jay Aldean, Deputy Director, Truckee River Flood Project

Discussion of a TRAction Project Agreement with the City of Reno in the amount of \$1.8 million for bridge alternative selection and 30% engineering design services for the Virginia Street Bridge. Possible action to recommend approval of the agreement to the FPCC.

F. AMENDMENT TO AGREEMENT WITH KAEMPFER CROWELL RENSHAW GRONAUER & FIORENTINO (LEGAL SERVICES) TO INCREASE BUDGET BY \$150,000

*Mimi Fujii-Strickler, Administrative Services Manager, Truckee River Flood Project
Greg Salter, Deputy District Attorney*

Discussion regarding proposed amendment to the existing agreement with Kaempfer Crowell Renshaw Gronauer & Fiorentino to increase the existing contract amount by \$150,000, from \$100,000 to \$250,000, for legal services in connection with the establishment of fees, rates and charges to be imposed to residents and businesses in Washoe County to finance the acquisition, construction, operation and maintenance of the Flood Project. Possible action to recommend approval of the amendment to the FPCC.

G. AMENDMENT TO RELOCATION AND LAND ACQUISITION SUPPORT SERVICES AGREEMENTS TO INCREASE TOTAL BUDGET BY \$305,000

Mimi Fujii-Strickler, Administrative Services Manager, Truckee River Flood Project

Discussion regarding proposed amendment to the relocation and land acquisition support services agreement budgets by \$305,000, from \$300,000 to \$605,000, for existing consultant contracts with Property Specialists, Inc., Overland Pacific & Cutler, and Associated Right-of-Way Services, Inc. Possible action to recommend approval of the amendment to the FPCC.

H. MONTHLY REPORTS ON FLOOD PROJECT FINANCIAL STATUS AND FINANCIAL RELATED ACTIVITIES

Lisa Gianoli, Consultant, Truckee River Flood Project

Update on monthly and year-to-date revenues and expenditures and related financial activities of the Truckee River Flood Project. Possible action to accept the report and/or provide direction to staff on related financial matters.

9:00
A.M.

6. **JPA WORKSHOP**
Naomi Duerr, Director, Truckee River Flood Project

Discussion regarding membership, governance, administration, and regulatory powers of the proposed Joint Powers Authority; the acquisition of land and the construction, ownership, operation and maintenance of flood facilities; the assessment and collection of rates and fees to pay for the project; the financing of the project; and the rights and obligations of parties to the Cooperative Agreement. Possible action to recommend approval of agreement by member agencies and/or provide direction to staff.

7. **RECAP OF NORTH TRUCKEE DRAIN GROUNDBREAKING**
Jay Aldean, Deputy Director, Truckee River Flood Project

Report on the groundbreaking event at the North Truckee Drain construction site on September 15, 2010.

8. **COORDINATION WITH RENO/TAHOE AIRPORT AUTHORITY**
Danielle Henderson, Natural Resource Manager, Truckee River Flood Project

Report on coordination efforts with the Reno/Tahoe Airport Authority regarding new construction and its impact on flood control. Possible action to accept report and/or provide direction to staff.

9. **TECHNICAL ADVISORY COMMITTEE (TAC) REPORT**
Wayne Seidel, TAC Vice Chair

Report on activities related to the Truckee River Flood Project's Technical Advisory Committee (TAC). Possible discussion and action to accept the report and provide direction to staff. Includes the August 27, 2010 minutes, October 1, 2010 meeting agenda, and attendance sheet.

10. **FLOOD PROJECT MONTHLY REPORTS**
Presentation on flood project events, activities, and schedules. Possible action to accept reports and/or provide direction to staff.

A. **MONTHLY STATUS REPORT FOR SEPTEMBER 2010**
Naomi Duerr, Director, Truckee River Flood Project

B. **CLIPPINGS**

11. **ARMY CORPS OF ENGINEERS**

A. **MONTHLY REPORT**
Beth Salyers, Project Manager, Civil Works Branch, ACOE

Report on activities related to the Truckee River Flood Management Project including project scheduling and funding. Will include update on documents and process for Internal Technical Review currently underway. Possible action to accept the report and provide direction to staff related to Truckee River Flood Management Project scheduling and funding items as set forth in the report.

B. **PROJECT TIMELINE REPORT**
Jay Aldean, Deputy Director, Truckee River Flood Project

C. DISCUSS POSSIBLE PROJECT SCHEDULE FOR AUTHORIZATION IN 2011
Naomi Duerr, Director, Truckee River Flood Project

Discussion regarding proceeding with a more aggressive Corps project schedule to result in approval of a Chief's Report in Fall 2011 and possible inclusion of the project in the Water Resources and Development Act of 2011. Discussion will cover the merits and possible risks associated with seeking project authorization in 2011 versus 2012, including:

- 1) the potential for the early approval of a "National Economic Development Plan" only;
- 2) potential delays in completing the Locally Preferred Plan and other project components,
- 3) the capability of the Corps of Engineers to meet the project schedule; and
- 4) possible strategies to improve the schedule or the anticipated outcomes.

Possible action to provide direction to staff and/or make recommendations to the Corps of Engineers.

12. PERFORMANCE EVALUATION OF THE FLOOD PROJECT DIRECTOR

Performance evaluation of the Flood Project Director, including but not limited to, goals objectives, and results of Director; consideration of current compensation and employee agreement.

13. COMMITTEE MEMBER COMMENTS, REQUESTS AND FUTURE AGENDA ITEMS

Possible action to approve items for future agendas.

14. ADJOURNMENT

Truckee River Flood Project

2010 MEETING SCHEDULE – REVISED 01/04/10

Month	FPCC	Finance Subcommittee	TAC	Working Group
January	1-21-10 ³	1-19-10	1-29-10	1-20-10 ⁴
February	2-12-10 ¹	2-11-10	2-26-10	2-24-10
March	3-12-10	3-11-10	3-26-10	3-31-10
April	4-09-10	4-06-10	4-30-10	4-28-10
May	5-14-10	5-13-10	5-28-10	5-26-10
June	6-11-10	6-10-10	Canceled	Canceled
July	Canceled	Canceled	7-30-10	7-28-10
August	8-13-10	8-12-10	8-27-10	8-25-10
September	9-10-10	9-09-10	9-24-10	9-29-10
October	10-08-10	10-05-10	10-22-10	10-27-10
November	11-12-10	Canceled	11-19-10	11-24-10
December	12-10-10	12-07-10	12-30-10 ²	12-29-10
Usual Day	2 nd Friday	1-3 days prior to the FPCC	Last Friday of the month	Last Weds. of the month
Time (Unless Noted)	8:30 a.m.	11:00 a.m. – 1:00 p.m.	10:00 a.m. – noon	3:00 – 5:00 p.m.
Location (Unless Noted)	BCC Chambers	Washoe County Caucus Room	Washoe County Central Conf Room	TRFP Conf Room

1 – Location TBD

2 - Time changed to 1 p.m.

3 – Date changed to Thursday

4 – Changed to third Wednesday