Excerpts from Salt Lake City Department of Public Utilities
1983 Flood GRAMA Document Production re: 1983 Flood
Damages at or Near 4th Avenue Well[1]

June 17, 2019

A) In a former DPU news article posted in 1999 but not currently on the DPU website, the City shows a photograph of how north of the Ottinger Hall location, the subsurface 24 inch main water distribution conduit down City Creek Canyon was exposed by floodwaters. Folio Page 7.

B) In a 1989 claim for reimbursement of 1983 flood damage, the City claimed $2.6 million to repair flood damages from Bonneville Drive to State Street including $600,000 in damages in Memory Grove and $1,000,000 for the road segment from Memory Grove to State Street, which includes 4th Avenue and North Canyon Road. Folio Pages 38-40.

C) Letter by L. Hooton, Jr. re: photographs of 1983 damage taken by James M. Montgomery Engineers. Folio Page 41.

D) Interlocal Agreement to Repair 6 inch subsurface pipeline at 4th Avenue and North Canyon Road unburied and damaged by 1983 flood waters. Folio Pages 53-63.

E) Tribune Article Sept. 1983 referencing $2M in repair work by supervised by Ronald Rash of James M. Montgomery Consulting Engineers. Folio Page 178.

F) Flood Assessment Memo June 17, 1983 reciting washout of 4" line at "Road to Memory Grove". At folio page 254, reports $739,000 in damage in "Memory Park Vicinity" including "Road washout severity taking with it water and sewer lines and utility connections." Folio Pages 241-260 at 245 and 254.

G) Sconfieoza Damage Memo circa June 15, 1983 stated that in the Memory Grove area "Approximately 18 sewer laterals will need to be replaced." Haslam Memo stated that “Brick Tank and Memory Grove road: Creek washing out footings of old brick tank structure . . . ” Folio Pages 263 and 265.

[1] “Folio Pages” refer to page references in the original June 11, 2019 GRAMA document production by the Department of Public Utilities of 288 pages.

ATTACHMENT “A”

Memorial Day Weekend 1983: Streets to Rivers

LeRoy W. Hooton, Jr.

May 28, 1999

As the snowpack melts this spring of 1999, we are reminded of the spring of 1983, when Salt Lake City's streets were made into rivers. This paper reminisces about that spring 16 years ago when flooding occurred in Salt Lake City, and in the aftermath, extensive flood control improvements were made, including the construction of Little Dell Dam and Lake Project in Parleys Canyon.

The Wet Season

The 1981- 82 Salt Lake area water year ended with a bang during the fall of 1982. A record-breaking 3.72 inches of precipitation hit the Salt Lake valley from Saturday September 25 to Tuesday September 28, 1982 causing widespread flooding. This was called a once in every 100 years storm. Described in the *Deseret News*, "the deluge Sunday, (was) termed the worst in Salt Lake County history, flooding more than 1,000 homes and forced the evacuation of 200 to 400 people. It sent down mud and rock slides, closing Big and Little Cottonwood canyons." The City's Big Cottonwood Water Treatment Plant was shut down by a landslide inundating parts of the plant with 4-feet of mud, but causing no structural damage. It was the third time during the year that heavy rains had forced the closure of this treatment facility. Likewise the City's Wastewater Treatment Plant received flows far in excess of its capacity, and a plea was sent out to city residents not to use their toilets or indoor plumbing until the surge resided. It was estimated that over 100 million gallons per day was being processed in the 56 million-gallon capacity plant. September 1982 was the wettest ever on record, and the water year ended with a record 24.40 inches of precipitation, more than 9 inches above the average.

Above Normal Winter Snowpack

The wet September was the harbinger of more wet weather to come. The winter months produced copious amounts of precipitation and snowpack. The wet cycle began to affect the water elevation in the Great Salt Lake. As early as December 1982, there were predictions that the lake could rise from 4,202 to an elevation of 4,210 during the decade. Early on there were discussions about a lake pumping plan.

According to the USGS California, Nevada and Utah experienced one of the most severe winters since the agency began collecting climatic data in the 1880s. Above normal snowpack and cool temperatures delayed the snowmelt until late May, when temperatures rose to the 80s.

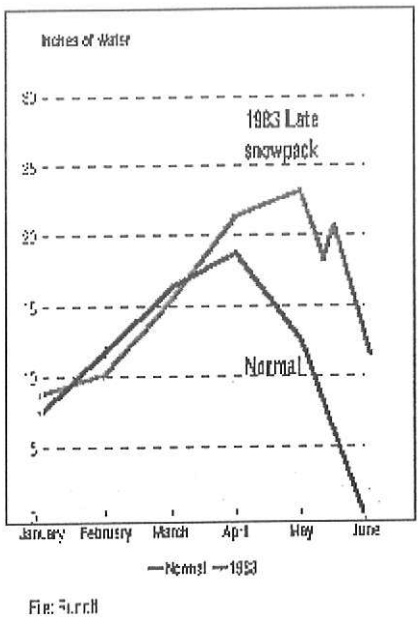
In western Nevada saturated soils caused slope failure in the Sierra Nevada

area. On Memorial Day, a massive landslide on the flank of Slide Mountain displaced two small lakes and sent a peak 30,000 cubic feet per second mud and debris flow roaring down Ophir Creek into Washoe Valley between Carson City and Reno. The Truckee River flow reached 2,000 cubic feet per second, nearly three times its normal flow.

Snowpack in the Colorado River Basin rose to 142 percent by the late spring. Mid winter measurements indicated about a normal run-off, but the late season storms delayed snowmelt. "In late May, the inflow [into Lake Powell] increased from 36,000 cubic feet per second to about 90,000 cubic feet per second. The peak inflow of about 126,000 cubic feet per second occurred in June." High releases from Lake Powell (Glen Canyon Dam) and Lake Mead (Hoover Dam) caused flooding along the Colorado River in Arizona and California.

Figure 1.0

Parleys Summit Snow Station



The 1983 snowpack built to late spring, resulting in flood flows.

The 1983 Spring Run-off

In mid April a giant wall of muddy earth from the Thistle slide in Spanish Fork Canyon blocked the Spanish Fork River, creating a natural reservoir, which inundated 22 homes in the town of Thistle.

In the Salt Lake area, the first sign of a problem occurred in late April when Emigration Canyon Road near the mouth of the canyon became a gapping 40–foot hole. According to Neil Stack, Salt Lake County Flood Control, "the massive crater was created when water from the surrounding hillsides seeped deep into the ground until it stopped behind a natural sandstone table and an impenetrable layer of soil under the road." There were also slides on East Capitol Boulevard near the mouth of City Creek canyon.

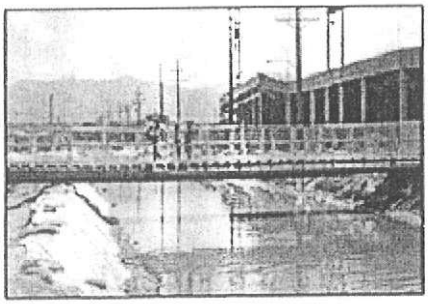
During early May rain showers and low elevation snowmelt caused minor flooding along 1300 South, beneath which runs the drainage of Red Butte, Emigration and Parleys Creeks through a storm drain conduit. Rains also caused flooding on Red Butte at Princeton Avenue and McClelland Street. The full 13th South conduit impeded the releases of water from Mt. Dell Reservoir in Parleys Canyon. On April 29, 1983 a meeting was held in the office of Salt Lake City Mayor Ted Wilson to discuss the potential of flooding and the difficulty of releasing water from Mt. Dell Reservoir. Terry Holzworth, director of County Water Quality and Flood Control talked about intentionally flooding areas along 13th South west of State Street. LeRoy W. Hooton, Jr., director of Salt Lake City's Public Utilities, noted that the

reservoir was already half full, and it should be empty to be able to store the expected run-off. He said, "We have only been able to take about 100 second-feet out of the reservoir. Normally we would be taking 150 to 200 second-feet out." It was agreed in order to reduce major flooding later, to force as much water as possible down the 1300 South Conduit. Salt Lake County Flood Control dredged the Jordan River in anticipation of high spring run-off.

Making Streets into Rivers

The conditions leading up to the Memorial Day weekend of 1983 can be described by viewing the Parleys Summit Snow Survey data (See Figure 1). While the May showers complicated the releases of water from Mt. Dell Reservoir and caused some local flooding, the growing snowpack in the Wasatch Mountains and cooler temperatures were building for a rapid run-off during late May and early June. As Figure 1 demonstrates, the water content in the snowpack continued to increase (above normal) until early May and began to diminish until mid-May when the anomaly occurred. The water content began to rise to over 20 inches instead of being reduced to nearly zero by June 1. This delayed melt, plus the high water content, led to making Salt Lake City's streets into rivers.

On May 26, 1983 at a hastily called meeting Salt Lake City declared an emergency and decided to dike 1300 South in order to convey flood waters from Red Butte, Emigration and Parleys Canyons to the Jordan River. The morning paper, (*Salt Lake Tribune*) read, "Mayor Calls Emergency, As Waters Flood Street." The story read, "The mayor after considering options and the impact of allowing Mountain Dell Reservoir in Parleys Canyon to overflow, made the proclamation of emergency in order to begin immediate sandbagging for berms and to start the work bypassing bid procedures in view of the flood threat brought by extremely high temperatures melting extremely wet mountain snows." Estimated cost of the 3-mile long man-made street canal was over one-half million dollars. The action was necessary to avert the potential of overtopping Mt. Dell Dam. On May 27, 1983 the combined flows of Red Butte, Emigration and Parleys creeks were 736 cubic feet per second.



Bridge across the 1300 South dike in front of Derks Field. The bridge was erected to allow the baseball season to open on schedule.

On May 28, 1983, the dike was completed and 300 cubic feet per second of water was released from Mt. Dell to gain control over the level of water in the reservoir storage area. "Before the release three times the amount of water was coming into the reservoir than going out," said Al Haines, Salt Lake City chief administrative officer.

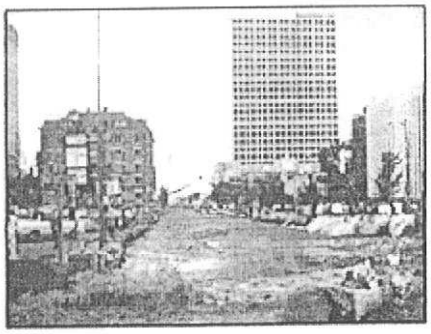
Statewide flooding occurred. In Juab County water was covering I-15. In Provo Canyon SR 92 was closed due to flooding. Floodwaters were flowing in the Weber and Ogden Rivers. Mudslides were common throughout the state from saturated soils. Diking was necessary to keep Utah Lake from inundating

I-15 south of Provo. Some flooding occurred in every county.

No sooner had the run-off from Red Butte, Emigration and Parleys Canyons been contained in the man-made 1300 South river, than City Creek became a problem. On Sunday May 29, 1983 City Creek jumped out of its banks in Memory Grove and started to flood the downtown business district of Salt Lake City. The City Creek storm drain conduit had plugged from sand, gravel and debris, forcing the water onto the street. A call went out for volunteers to sand bag about 1-1/2 miles of State Street to 4th South where the floodwater could be conveyed to the Jordan River. It was estimated that about 6,000 volunteers responded. Later this volunteer response was described by Mayor Wilson, as "the biggest street festival ever." Later it would be necessary to extend the sandbags to 9th South. The City Creek Water Treatment Plant was taken out of service as the intake and coagulation basins filled with grit. City Creek Canyon was heavily damaged from the floodwaters.

Trained City employees worked long and hard to control the floods. An example of an individual effort was an instance that occurred on Creek Road. As the City Creek flood waters spilled onto Creek Road below Memory Grove it carried with it high concentrations of grit and silt debris (the same material that had plugged the storm drain conduit). Canyon Road eroded, washing a gapping hole in the road, exposing a sanitary sewerline and breaking it. The heavy concentration of grit and silt was entering the sewerline and had the potential of plugging the entire sewer system within the main business district. If this had occurred it could have closed the area for business until the sewer system was cleaned and usable. Marvin Johnson, a Public Utilities sewer worker braved the fast moving water on Creek Road and climbed down a manhole and placed a sand bag into the sewer pipe and scurried out before the manhole filled with water. Although many citizens lined the street, including councilperson Sydney Fonnesbeck, most did not realize what the consequences would have been if the action had not been taken.

City Creek Canyon was severely damaged from the flood flows. The streambed and stream banks were scoured and washed away. Trees were uprooted and fell in every direction. Likewise vegetation and parts of the canyon road were washed away. Memory Grove sustained substantial damage, including exposing a large watermain that conveyed water supply from City Creek to the downtown business district. Approximately $2 million were spent to repair the canyon.



Looking south the State Street river. In the distance is Eagle Gate on South Temple Street.

During the flood period, volunteers played a key role in managing the situation. An estimated 50,000 person days of effort in Salt Lake City and about twice that amount in the remainder of the county were utilized in flood

control efforts. This was estimated to be valued at $18 million. In the county 1.6 million sandbags were filled and placed, and another million in Salt Lake City.

Record Flows and Damage

Salt Lake City is located on the edge of the Great Basin Desert. It's not accustomed to high flood waters. The volumes of water that flooded Salt Lake City during the Memorial Day weekend of 1983 by most standards were not large. In other parts of the United States thousands of cubic feet of water flow is not uncommon. Flooding on the Missouri or Mississippi can inundate thousands of acres of land. Nevertheless, the spring floods of 1983 affected most of the western United States and within Salt Lake County caused millions of dollars in damage. Salt Lake County Flood Control identified 1,500 damaged sites at an estimated $34 million. Statewide the estimated damage costs reached $200 million. President Reagan granted Tooele, Garfield, Box Elder, Piute, Summit, Carbon, Emery, Utah, Davis, Millard, Weber and Salt Lake Counties disaster status.

Parleys Creek peaked on May 29, 1983 at 605 cubic feet per second 3.8 times its 160 cubic feet per second flood stage. This flow occurred when Mt. Dell was nearly full and unable to store the high peak flow. City Creek peaked on June 2, 1983 at 305 cubic feet per second, a flow 3.38 times its flood stage of 90 cubic feet per second and nearly double the record of 158 cubic feet per second that occurred in 1921.

The Aftermath

Major flood control projects were constructed in the aftermath of the 1983 floods. On December 13, 1983 Salt Lake County voters approved a $33 million bond issue to pay for restoration costs and a capital improvement program to improve flood control facilities. Stream channel improvements allowed even higher flows to be conveyed to the Jordan River in 1983 and 1984. Debris basins in City Creek corrected the problem of grit flowing into the storm drain conduit and plugging it. The debris and grit are removed in the basins and hauled away. FEMA funds paid for much of the damage costs.

Flooding in Memory Grove exposes 24- inch water pipeline.

The flood gave the final impetus to construct the Little Dell Dam and Reservoir in Parleys Canyon – Dell Fork, up-stream of the inadequate Mt. Dell Dam and Reservoir. Completed in 1992, this flood control and water supply project will greatly minimize the need to ever make 1300 South a river again.

The 1983 flood was the beginning of a 4 year wet cycle that would cause the Great Salt Lake to rise to the 4211.6 elevation in the spring of 1986. The

Great Salt Lake Pumping Plant was constructed by the state to control the level of the lake. This facility operated for some time, and it will be available in future years, if the lake rises again.

A Great Effort By All

Public employees responded to the emergency situation, providing the leadership to first manage the floods and then make the necessary repairs. Volunteers played a key role in responding to flood threat. National attention to the flooding highlighted the community's volunteerism efforts in time of need.

Mayor Ted Wilson praised employees, volunteers, businesses, church and civic groups for their efforts. A resolution was passed by the City Council. Mayor Wilson said, "In recognition of (their efforts) a resolution was issued by the City Council and myself on June 7, 1983, to attempt to express our heartfelt appreciation for all who were involved in fighting the flood waters."

Questions regarding this article can be directed to: leroy.hooton@ci.slc.ut.us

Selected References

United States Geological Survey Year Book, FY 1983, p.8

Ibid, p. 11

Salt Lake Tribune, April 25, 1983, "Crews Struggle With Emigration Canyon Repair" Doug Clark

Deseret News. April 30, 1983, "S.L. area may be flooded as preventative measure" Lee Davidson

Salt Lake Tribune, May 27, 1983, "Mayor Calls Emergency, As Waters Flood Street" Jon Ure

Salt Lake Tribune, May 28, 1983, "Spring Run-off Hits Us Hard"

Deseret News, June 26, 1983, "It took planning. but lots of help, it worked.

Effective Emergency Response, Retrospect Report No. 1, Public Works Historic Society, p.11

Ibid, p.12

Ibid, p.12

www.slcgov.com/services/utilities/news030449html (for more information on the Great Salt Lake)

Official Rumor, July 1983, "Beating the Floods," by Mayor Ted Wilson

ATTACHMENT “B”

Tim, the highlighted items are the ones we have some documentation for

Ken Sorenson
matt
Canyon & Straits

Mausay Re: City of Salt Lake - Salt Lake City, Utah
Date of Loss - May 29, 1983

REQUEST FOR DOCUMENTATION (DSR's, CHECKS, INVOICES, PURCHASE ORDERS, WORK ORDERS etc.)

- if any other line items on this sheet have documentation at this office please have the info available for us tomorrow at 1:30 p.m (1/19/89)

Location	DSR #	As Claimed	Code	Description
North Temple Repairs		$350,000.00	DD	Road Damage State St. to 4th West
North Temple Conduit		24,400.00	DD	Union Pacific Railroad damage
North Temple		320,000.00	DD	Conduit damage 4th West to 8th West
Emigration Creek		150,000.00	DD	Conduit damage 13th So and 20 East
Emigration Canyon		19,200.00	DD	Road damage
Red Butte Creek		100,000.00	DD	Creek bed damage
Parley's Cr		60,000.00	DD	Creek bed damage at Sugarhouse Park
Parley's Cnd		25,000.00	DD	Conduit damage Sugarhouse to St. Street
Devonshire Drive		2,000.00	DD	Street Settlement resulting from undermining of the road from snowmelt
East Capitol Blvd		5,000.00	DD	Embankment settlement resulting in depression of 100 ft of curb & gutter
1300 South		5,000.00	DD	Roadway scoured and eroded
800 South-West Temple & 4th West		9,000.00	DD	Street & Manhole damage
City Engineers Dept		1,391.00	DD	Damage to Ford Sedan #2035
[redacted]ic Works		56.00	DD	Jackhammer damage 304962
1300 So 500 Es	77509	316.00	DD	Curb & Gutter Damage
Fremont St		1,710.00	DD	Street Damage
Paxton Pump station		1,144.00	DD	Sink Hole
Hogle Zoo & Mouth of Emig	76687	2,200.00	DD	Line shift during high creek flow
Boundry tanks	76688	2,120.00	DD	Loss of 80 LF-8 inch water line
Upper Boundry Springs-MC	76695	6,250.00	DD	Stream bank erosion undercut line
Lower Boundry Springs-MC	76696	661.00	DD	Rock & Silt deposition around spring box
Terrace Elbow Fork wier	76697	627.00	DD	High flow caused water to bypass weir
2211 Millstream Ave	76698	1,000.00	DD	Two inch service line washed out #624.23

All included on 1 DSR

Mausau Re: City of Salt Lake - Salt Lake City, Utah
Date of Loss - May 29, 1983

REQUEST FOR DOCUMENTATION (DSR's, CHECKS, INVOICES, PURCHASE ORDERS, WORK ORDERS etc.)

Location	DSR #	As Claimed	Code	Description
Green Acres RD	76705	2,340.00	DD	Water line crushed to save road (By county with Bridge)
Upper Irrigation canal	76707	20,000.00	DD	Stream bank erosion caused line exposure
Green Irrigation Ditch	76728	5,000.00	DD	Diversion structure wing-walls undercut
Tanner Irrigation Ditch	76730	15,000.00	DD	Structure washed away during high creek flow
Burr Fork wier	76868	316.00	DD	High flow cut new channel around Weir
So Slope Emig. Canyon	77357	61,800.00	DD	Slide took out storm sewer line
[redacted] Place & Canyon Rd	77448	1,200.00	DD	Sinkhole caused erosion along storm sewer
Brown & Sanford Irrig	77458	3,000.00	DD	High flow undercut ditch & ditch collapsed
Emig. Canyon, So Slope	77460	29,538.00	DD	Landslide carried away sewer line included in South Slope Emig
Emig. Canyon, So Bank	77461	23,130.00	DD	Back slide collapsed road & water line
Meabs Creek, Above Hwy 65	77771	988.00	DD	Rock & Silt damage to road and channel - does not include support
Sheep Trail Bridge-Dell	77772	1,580.00	DD	Northwest wingwall undercut & collapsed
Dell Creek	77773	1,030.00	DD	Flow eroded band downstream exposing pipe
Affleck Park	77774	6,000.00	DD	Bridge Abatement undercut & shifted
Jordan & Salt Lake Canal [redacted]le Cottonwood Creek	76261	60,000.00	DD	Bridge Washed out County
anything else which is here.		220,000.00	DR	North Temple Conduit
		10,000.00	DR	600 to 800 South Storm Drain Cleaning
		10,000.00	DR	White Ball Field Cleanup
		10,000.00	DR	West Bonneville Blvd.
PC	77770	$352.00	DD	Exposed Water Line - county did -
PC		60,000.00	DD	Creek Bed Damage -
PC		25,000.00	DD	Parley's Conduit - county -
BCC		225,000.00	DD	Diversion Structure Damage
BCC		20,000.00	DD	Grate Damage
BCC		25.44	DD	Replacement Parts - Treatment plant equipment
BCC		166.00	DD	Paddle Replacement - Repair wooden paddles broken by debris

Nassau Re: City of Salt Lake - Salt Lake City, Utah
Date of Loss - May 29, 1983

REQUEST FOR DOCUMENTATION (DSR's, CHECKS, INVOICES, PURCHASE ORDERS, WORK ORDERS etc.)

Location	DSR #	As Claimed	Code	Description
		$245,191.44	DD	
CC		9,000.00	DD	Gabion Structure - 77451
CC	77453	2,112.00	DD	Damage to Gallary's 77453.
CC		300,000.00	DD	Road Damage - Rotary Part to TX Plant 76974
CC		460,000.00	DD	Road Damage - Bonneville Drive TX Plant
MG		1,000,000.00	DD	Roads - Memory Grove to State Street
MG		1,000,000.00	DD	Roads - Memory Grove to Bonneville 77447
MG		600,000.00	DD	Roads - Memory Grove 77446
MG		8,551.00	DD	Roads - Memory Grove Canyon Road
		$2,608,551.00	DD	
		3,766.55	M	Clothing
		4,558.50	M	Tools
		34.24	M	Office Equipment
		10,174.65	M	Miscellaneous
		13,208.10	M	Barricades/Road Signs

ATTACHMENT “C”

Sent 3-21-86

March 20, 1986

Dr. Ellis L. Armstrong
Ellis L. Armstrong Associates
Engineers & Consultants
3709 Brockbank Drive
Salt Lake City, UT 84117

Dear Dr. Armstrong:

Enclosed are prints of the 1983 flood which were taken by James M. Montgomery Engineers.

You requested these pictures some time ago, and we have finally been able to obtain them.

Sincerely,

LEROY W. HOOTON, JR.
Director

LWH:jf
Enc.
69:22

ATTACHMENT “D”

clerk 4-8-85

TO: Salt Lake City Council DATE: April 4, 1985

RE: Interlocal Agreement with Salt Lake County for 1983 Flood Repairs and Restoration of Six-Inch Pipeline on Canyon Road and Fourth Avenue to Memory Grove

Recommendation: That the City Council approve the agreement.

Availability of Funds: Public Utilities Department current earnings, cash reserves and 75 percent FEMA reimbursement.

Discussion: During the 1983 flood incident some of the Public Utilities Department's facilities were damaged at Canyon Road and in City Creek Canyon near the water treatment plant. Salt Lake County also had damage to the creek channel in these areas and had extensive restoration work. FEMA recommended that the restoration work at these locations be completed by the same contractor under contract with Salt Lake County. It is anticipated that city Public Utilities Department will be reimbursed by FEMA at their participation ratio.

Submitted by,

LEROY W. HOOTON, JR.
Director

ETD:jg
Enc.
49:10

Sent to Al H.
2-14-85

TO: Salt Lake City Council DATE: February 8, 1985

RE: Interlocal Agreements with Salt Lake County for 1983 Flood Repairs

Recommendation: We recommend that the City Council approve the agreements.

Availability of Funds: Public Utilities Department current earnings, cash reserves and 75 percent FEMA reimbursement.

Discussion: During the 1983 flood incident some of the Public Utilities Department's facilities were damaged at Canyon Road and in City Creek Canyon near the water treatment plant. Salt Lake County also had damage to the creek channel in these areas and had extensive restoration work. FEMA recommended that the restoration work at these locations be completed by the same contractor under contract with Salt Lake County. It is anticipated that city Public Utilities Department will be reimbursed by FEMA at their participation ratio.

Submitted by,

LEROY W. HOOTON, JR.
Director

ETD:jg
Enc.
49:10

RESOLUTION NO. 1235 DATE 12.19.84

RESOLUTION APPROVING INTERLOCAL AGREEMENT
WITH SALT LAKE CITY FOR REPAIR OF
CANYON ROAD PIPELINE

BE IT KNOWN BY THESE PRESENTS:

WHEREAS, Salt Lake City and Salt Lake County are governmental entities; and,

WHEREAS, the Utah Interlocal Cooperation Act provides that governmental entities may contract for the performance of functions which either entity is individually authorized to do; and,

WHEREAS, City and County have identified a need to repair a pipeline utilized for the control of storm and flood waters, which is situated on Canyon Road and Fourth Avenue, to Memory Grove; and,

WHEREAS, City and County desire to cooperate in the repair and restoration of said pipeline; and,

WHEREAS, an agreement has been written to set forth the rights and responsibilities of City and County relating to said endeavor, which agreement is incorporated by reference;

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners for Salt Lake County that the referenced

agreement be adopted and the Chairman of said Board is hereby authorized to execute the same.

DATED this 19th day of Dec, 1984.

BOARD OF COUNTY COMMISSIONERS
OF SALT LAKE COUNTY

ATTEST:

By _____
Chairman

Salt Lake County Clerk

APPROVED
Salt Lake County Attorney's Office
By: _____
Deputy County Attorney
Date: 25 Dec, 1984

13

INTERLOCAL AGREEMENT FOR
REPAIR AND RESTORATION OF A
SIX-INCH PIPELINE ON CANYON ROAD
AND
FOURTH AVENUE TO MEMORY GROVE

THIS AGREEMENT is made and entered into as of the 19th day of June, 1984, by and between SALT LAKE COUNTY, a political subdivision of the State of Utah, hereinafter "County", and SALT LAKE CITY CORPORATION, a municipal corporation of the State of Utah, hereinafter "City".

W I T N E S S E T H:

WHEREAS, the City owns a six-inch pipeline laid on Canyon road and Fourth Avenue to Memory Grove; and

WHEREAS, said pipeline was damaged by recent flooding within Salt Lake County; and

WHEREAS, the County is concerned with the restoration and/or repair of several flood-damaged areas, including areas in the vicinity of said pipeline; and

WHEREAS, the parties desire to cooperate with each other concerning the repair of the referenced pipeline; and

WHEREAS, the Utah Interlocal Cooperation Act authorizes the parties to agree together to accomplish a function which either of them are individually authorized to do; and

WHEREAS, the parties have heretofore solicited, and received, bids from various contractors for the repair of flood damage occurring to said pipeline; and

WHEREAS, the parties desire to award a contract for said repair work to the apparent low bidder for such work;

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, the parties agree as follows:

1. The County shall utilize its normal purchasing procedures to award a contract to the qualified low bidder for the restoration and repair of

the City's six-inch pipeline on Canyon Road and Fourth Avenue to Memory Grove.

2. In its contract with said low bidder, the County shall include a clause which shall require the contractor to obtain and carry suitable insurance to protect the City against liability claims in the following minimum amounts: $250,000 each person and $500,000 each occurrence for bodily injury or death; and $100,000 for each occurrence property damage. Said clause shall further require said contractor to indemnify, save harmless, and defend the City, its officers and employees, from and against all claims for damages, including attorney's fees, based upon or arising out of said contractor's performance, or failure of performance, under its contract with the County.

3. The parties stipulate that the work shall be done under the contract between the County and the contractor consists of the work outline on Exhibit "A", attached.

4. The City stipulates that it has examined the specifications pertinent to the work to be done and finds them satisfactory to the workmanlike repair and/or construction of the bypass channel.

5. The County shall administer said contract and perform all necessary and proper inspections of the work. The County shall not accept the work or release the contractor from its obligations for repair or replacement of said pipeline without prior written consent and approval of the City's Director of Public Utilities. The County shall not issue any change orders, or otherwise amend the contractual terms relevant to said repair or restoration without prior written consent and approval of the City's Director of Public Utilities.

6. The parties stipulate that the repair work being done under the contract may be eligible for participation in federal and state disaster relief programs. The County shall make available to the City all data and

documentation which the County may have to help expedite the City's effort in obtaining said relief funds.

7. The City shall be responsible to pay the County for its proportionate share of expenditures, not to exceed the sum of $16,594.00, plus two percent of all actual costs associated with the project as payment for costs incurred by the County in the administration of the project. The parties stipulate that the City's responsibility hereunder shall be satisfied from its public utilities funds. Payment by the City shall be made upon demand by the County.

8. In the event the contractor defaults, or otherwise fails to complete the work under its contract, the County shall be responsible to the City therefore only to the extent of the County's remedies against the contractor under the County's contract with said contractor.

9. The parties agree that time is of the essence in the performance of all obligations imposed upon them by this agreement.

10. This agreement constitutes the entire understanding between the parties, and no other provisions, oral or written, express or implied, shall be permitted to modify this agreement.

IN WITNESS WHEREOF, the parties executed this agreement, through their duly authorized representative, as of the day and year first set forth above.

SALT LAKE COUNTY

By _____
D. MICHAEL STEWART, Chairman
Board of County Commissioners

ATTEST:

_____
Salt Lake County Clerk

SALT LAKE CITY CORPORATION

By _____
TED L. WILSON, Mayor

ATTEST:

_____
Salt Lake City Recorder

STATE OF UTAH)
) ss.
County of Salt Lake)

On the _____ day of _____, 1984, personally appeared before me TED L. WILSON and KATHRYN MARSHALL, the signers of the foregoing instrument, who being by me duly sworn, did say that they are the Mayor and City Recorder, respectively of SALT LAKE CITY CORPORATION, a municipal corporation of the State of Utah, and said persons acknowledged to me that said corporation executed the same.

_____
NOTARY PUBLIC, residing in
Salt Lake County, Utah

My Commission Expires:

_____

STATE OF UTAH)
)
County of Salt Lake)

On the 19th day of December, 1984, personally appeared before me D. MICHAEL STEWART, who being by me duly sworn, did say that he, the said D. MICHAEL STEWART, is the Chairman of the Board of Salt Lake County Commissioners and that the within and foregoing instrument was signed in behalf of SALT LAKE COUNTY by authority of the Board of County Commissioners at a regular meeting held on the 19th day of December, 1984, and that the said D. MICHAEL STEWART duly acknowledged that Salt Lake County executed the same and that the seal affixed is thre seal of said County.

Linda A. Hatt
NOTARY PUBLIC, RESIDING in
Salt Lake County, Utah

My Commission Expires:
May 1, 1986

APPROVED AS TO FORM
Salt Lake County Attorney's Office
By: BS Egli
Deputy County Attorney
Date: 8-14-84

EXHIBIT "A"

PRICE SCHEDULE
6-Inch D.I.P. Pipe
Canyon Road 4th Avenue to Memory Grove
WATERMAIN EXTENSION 35-4244

ITEM	QUANTITY	UNIT COST	COST
1. Furnish & Install 6" D.I.P. Class 52 Complete With Fittings	1040 L.F	10.60	11,024.00
2. Reconnect 3/4" Copper Service Lines Complete	13 ea.	135.00	1,755.00
3. Reconnect Existing Fire Hydrant With Fitting	2 ea.	440.00	880.00
4. Reconnect 1-1/2" Service Line, Complete	1 ea.	205.00	205.00
5. Reconnect 2" Service Line, Complete	1 ea.	245.00	245.00
6. Furnish & Install 6" Gate Valve With 3 Piece Valve Box	2 ea.	355.00	710.00
7. Install Plug As Necessary	1 ea.	235.00	235.00
8. 2" Without Assembly Complete	1 ea.	280.00	280.00
9. Select Backfill-Supply & Install	100 C.Y.	7.85	785.00
10. Roadbase-Supply & Install	50 C.Y.	9.50	475.00
			$16,594.00

Total

I, Craig L. Young, certify that all insurance documents, bonds required by the City for this extension will be completely filled out and submitted to the City within seven (7) days of the bid opening and agree to begin installation within five (5) days after receiving written authorization from the City to begin the work. Construction for this project will be continuous without interruption.

Craig L Young
NAME
Vice President
TITLE

NOTE: COMMITMENT DATE THAT CONTRACTOR WILL BEGIN CONSTRUCTION: 4-2-84

38:1:1

Control No. F-335-E
FU-R-85-1552

SALT LAKE COUNTY

CHANGE ORDER

DATE 3-26-84

Contract No. 1282.5091

Change Order No. _____

Date of Original Contract 10-21-83

Contractor's Name

Date Approved _____

J + M CONSTRUCTION

THIS IS A CONTRACT CHANGE ORDER

A. Effective immediately, the following change(s) is hereby directed in accordance with the provision and conditions of the "changes" clause of subject contract:

Description of Changes	Increase in Contract Price	(Decrease) in Contract Price	Contract Time Extension (Days)
6" WATER LINE 4TH AVE TO MEMORY GROVE AS PER ATT. SCHEDULE	$ 16,594.00	$	11 days
TOTALS	$	$-	11 days
Net Change in Contract Price Increase or (Decrease)	$		

B. Contractor must submit any claim for price adjustment to Salt Lake County caused by this change within thirty (30) calendar days after the date of receipt of this Change Order or such other period as may be allowed by the contract. The claim must include current, complete and adequate cost data and the exact effective point of the change(s) herein by calendar date or by unit number unless such effective point is set forth herein.

C. Salt Lake County For SLC No. _____ "Change Order Cost Breakdown" is attached hereto and must be submitted with contractor's claim for equitable adjustment for such claim to receive consideration.

D. Salt Lake County reserves the right, in the event the contractor fails to submit his request for equitable adjustment with the required supporting cost data in the time limit set forth in Clause "B" above or as may be extended by the County, to assume that the changes required herein will be performed at no cost to the County and shall issue a contract amendment accordingly.

E. Kindly acknowledge receipt of this Change Order specifying the date of receipt on the acknowledgement copy, signing same and return to the County within three (3) calendar days of such receipt.

SALT LAKE COUNTY

Signature _____

CHAIRMAN, BOARD OF COUNTY COMMISSIONERS

Form No. DPCO 70

CHANGE ORDER

CONTRACTOR

Control No. F-335-E
FU-R-85-1552

SALT LAKE COUNTY

CHANGE ORDER

DATE 3-26-84

Contract No. 1282.5091

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Date of Original Contract 10-21-83

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D. Salt Lake County reserves the right, in the event the contractor fails to submit his request for equitable adjustment with the required supporting cost data in the time limit set forth in Clause "B" above or as may be extended by the County, to assume that the changes required herein will be performed at no cost to the County and shall issue a contract amendment accordingly.

E. Kindly acknowledge receipt of this Change Order specifying the date of receipt on the acknowledgement copy, signing same and return to the County within three (3) calendar days of such receipt.

SALT LAKE COUNTY

Signature _____

CHAIRMAN, BOARD OF COUNTY COMMISSIONERS

Form No. 19 Clo 20

CHANGE ORDER

CONTRACTOR

ATTACHMENT “E”

TRIBUNE, September 16,1983

Flood Damage Repair in City Creek Canyon Set at $2 Million

More than $2 million will be spent by federal, state, county and city agencies to fix extensive damage to City Creek Canyon, one of the hardest hit areas in last spring's record flooding.

Principal work is expected to be finished before next spring's runoff season, but the entire project won't be complete until June, officials say. Ironically, they add, everything depends upon the weather.

Of the total project cost, about 75 percent is expected to be paid by the Federal Emergency Management Agency, with local governments picking up the balance.

Unprecedented amounts of runoff cascaded down the canyon last spring, gouging new channels in the streambed, uprooting trees and plants and devastating the grotto-like Memory Grove park.

Canyon Destablized

The raging water's impact was great. "The whole canyon was destabilized," said LeRoy W. Hooton Jr., city Public Works director. "A great deal of creek bed washed out."

According to Mr. Hooton, restoration will entail rebuilding streambeds and banks, removing trees and debris, revegetating and replacing utility lines. The restoration work is being done in three phases with three contracts awarded.

The first phase began Aug. 18 and is about 10 to 15 percent complete. It involves restoring the streambed from Bonneville Drive, which loops around the lower part of the canyon, to a Salt Lake City water treatment plant about halfway up the City Creek Canyon, according to Neil Stack, engineering administrator for Salt Lake County Flood Control.

Water, sewer and some electrical lines also are being repaired and replaced in this phase, as is the road surface on Canyon Road.

When the first phase is finished on or about Oct. 28, it will have cost about $460,000, Mr. Stack said. The Tooele construction firm of Christensen and Griffith is doing the work.

"It's expensive," Mr Hooton said, "but necessary to define the new creekbed."

'Expensive, Necessary'

Bids for phases two and three, which cost equally as much, will be let within the next two weeks.

Phase Two includes restoring the canyon and creekbed from Bonneville Drive to Memory Grove and the construction of two desilting basins on either side of the intersection of Bonneville Drive and Canyon Road.

Phase Two will cost just under $500,000 and includes some restoration work above the treatment plant

Continued From Page B-1

which likely won't be completed this year.

Flood control workers will be able to manually retrieve debris from the desilting basins during heavy runoff to prevent surges of water. Work on the basins could proceed into the winter in order to be finished by spring, he said.

In order for the 10,000-cubic-yard basins to be built, Bonneville Drive will be rerouted to the south, eliminating a dangerous curve in the process. Canyon Road will also be rerouted to tie in with Bonneville Drive east of the current intersection.

Both roads, closed all summer, will be surfaced — temporarily or permanently — this fall and should be carrying traffic by winter, according to Ronald Rash of James M. Montgomery Consulting Engineers, a firm hired to act as project coordinator for all flood damage in the county.

As for repair work in the top of the canyon, the headwaters of City Creek, "We really haven't got a handle on that area yet," Mr. Hooton said. If major work has to be done in the top 1⅛ miles of the canyon, roads possibly would have to be bulldozed up the canyon, which will resulting in a major environmental impact, he said.

Since this area hasn't been fully assessed, costs to repair the damage are unknown.

Phase Three of the project is the restoration of Memory Grove itself, which will cost about $600,000.

Mr. Montgomery said the plan is to restore the park faithfully, including the reconstruction of a concrete-embanked pond to replace the one that was washed out.

ATTACHMENT “F”

FLOOD ASSESSMENT

Meeting held June 17, 1983

In Attendance: Russ Hone
George Jorgensen
Dick Sherwood
Scott Haslam
Dallas Richins
Tim Doxey
Dan Schenck
Frank Sconfienza

Tim asked those present to prepare a list of areas under their jurisdiction which were damaged from the flood. Tomorrow Floyd Nickels and Tom McVigh from EPA would go out and look at the damage.

Tim asked Scott to check the pipe in City Creek (1-35-2) which is the broken watermain to the treatment plant. On the road to Memory Grove there's a broken 4-inch line which needs repair and errosion protection. Any hydrants which are broken will need to be listed; also, valve boxes which are out in State Street and North Temple. Need to replace cross connection valves we are doing on North Temple.

Frank will have to do the same for the sewer. He will also add televising.

Dallas said that Boundary Springs lines are a problem. Also, we had concrete on the bank of the creek to protect the runoff water and it is now smashed.

Tim said that we plant to do City Creek and Big Cottonwood treatment plants. We need to go back to April 12, 1983, and use everything damaged from that day on. Also, there should be another list prepared which goes back to the flood of September ___, 1982, up until April 11, 1983.

In Emigration Canyon we need to include the pipeline that we are getting muddy water in. We will add the cost of replacement in that pipeline. The sewer division will add new sewer pipeline off the hill and any other problems. Also, add Affleck Park. Check that again and any others including sewer facilities.

Dan will need to get a list of the gaging and rating stations, etc.

Scott was asked to check on the pipeline in Parley's Canyon underneath the H ramp where there has been saturation.

Montgomery engineers will price out the costs. Don't list any private property.

FLOOD ASSESSMENT

BY: Richard Sherwood

Big Cottonwood Treatment Facilities

A. 20-Foot Parshall

Trees and rocks filled approach. Washed around wing walls

B. Bypass Channel

Concrete and rails damaged and missing. Large hold bottom channel and underwashed.

C. Intakes

Intake gate seats gouged and leaf blow off pipe damage. Grates broken and intake filled with rock. Brown and Sanford grates broken and rock-filled intake. Brown and Sanford flume washed out 75 feet. Radial gate axle replaced and reset.

D. Sludge Beds

Roads washed and undercut effluent pipes and structures.

E. Lower Bridge

Shoulder replaced and asphalt

F. Big Cottonwood Conduit

Deep wash cut into trench - possible undercut pipe bedding.

G. Sandbagging and rating bridge removed and reset

Big Cottonwood Plant

A. Coagulation basin filled with heavy sand silt. Sludge pipes plugged.

B. Coagulation paddles broken off shift

C. Screen discharge pipe to creek broken

F. Equipment damaged sedimentation basin roof

G. Flood watch patrol up-canyon and overtime

H. Rental oversize blower for air lifts.

E. Affleck Park

The bridge in the park has been washed out (see Special Flood Damage Report and Remedial Repair Report on road) We must include the road and several picnic areas on the west side of the stream. The road has had water and debris on it causing damage to it and the picnic grounds.

Mill Creek Canyon

Pipes from Upper and Lower Boundary Springs are exposed in various areas and supports across the stream may be in danger from the high water. Diversion wall at Upper Springs has collapsed into the stream. Lower Boundary Spring overflow structure has had some damage.

Neff's Canyon

Water has run down the road from the spring box to the tank. Some damage--needs regrading. A pipe is exposed in some areas. It is unknown if it is the existing line.

RH:jg
6/17/83

REMEDIAL REPAIR AREAS

"Remedial Repair Areas" have been identified in each of the drainage areas. These are flood damage areas that should be given immediate attention by the maintenance crews of Salt Lake County and the various Cities. These repair areas are organized by drainage area and include the following information: identification number, address, cost estimate and brief description of the damage and the necessary repair action.

In general, the "Remedial Repair Areas" are characterized as minor/maintenance-type damage areas that generally require minimum money to repair or restore the damage, require a minimum analysis of the method by which the damage should be repaired and constitute a significant threat to public and/or private property and life. It is recognized that each jurisdiction may have already performed several of the repair items that are listed on the following pages. However, it is recommended that this list be carefully reviewed in order to determine whether or not the required repairs have been performed. If the necessary repairs have not been completed at these damage areas, it is likely that another damaging rainfall/runoff event will cause additional flood damage.

The field data contains many other damage areas that could have been included in the "Remedial Repair Areas" list. However, the Assessment Teams have attempted to unbiasly identify only those areas that they have determined to be very critical in order to protect property and life, irregardless of jurisdictional responsibilities.

REMEDIAL REPAIR AREAS

I.D. No.	Address	Cost Estimate	Description
1. CITY CREEK DRAINAGE AREA			
1.1-1-4 and 1.1-2-2,5&6	State Street, North Temple to 13th South	$ 16,000	Silted up storm drains need to be cleaned and repaired to restore full capacity. Sanitary Sewer
1-32-1	Below City Creek Treatment Plant	$ 5,000 ?	Major slide into stream channel with vertical bank.
1-35-2	Below City Creek Treatment	$ 4,000	Broken 16" waterline to treatment plant.
1-40-1	Below City Creek Culinary Reservoir	$ 10,000	Large rocks bridging stream. Backup would threaten road and finished waterline.
1-21-1 thru 1-57-1	City Creek Canyon	$ 70,000	Bank erosion has damaged road or shoulder in numerous locations. Must be repaired to maintain safe access to treatment plant.
1-56-1	At City Creek Canyon Entrance	$ 15,000	Major slide into stream channel with vertical bank adding to sediment problem.
1-70-1	Road to Memory Grove	$ 2,000 ?	Broken 4" waterline needs repair and erosion protection.
Special 1-99-1	Intersection at North Temple and ~~2nd West~~ Viaduct	$ 35,000	Large sink hole in middle of intersection caused by hole in storm sewer.

1-100-1 thru 1-118-1	North Temple from the viaduct to to the River	$2,109,000	Repair damage to plugged storm sewer under the viaduct to restore service to railroad. Clean out silted storm sewer for its entire length to the river. Restore roadway.

2. RED BUTTE DRAINAGE AREA

No Remedial Repair

3. EMIGRATION DRAINAGE AREA

3-1-1	500' East of Box 9600 (Pinecrest Development)	$ 20,000	Culvert and roadway are washing out.
3-2-1	300' East of Box 9600 (Pinecrest Development)	$ 20,000	Culvert and roadway are washing out.
3-3-1	Box 9600 Pinecrest	$ 20,000	Culvert and roadway are washed out.
3-202-1&2	1300 South 2nd East to State	$ 118,000	Roadway cleanup and repair, also box culvert cleanup.
3-203-1,2&3	1300 South State to West Temple	$ 418,000	Roadway cleanup and repair also box culvert cleanup.
3-204-1,2&3	1300 South West Temple to 400 W	$ 654,000	Roadway cleanup and repair and box culvert cleanup.
3-206-1,2&3	1300 South 400-500 West	$ 421,000	Roadway cleanup and repair and box culvert cleanup.
3-207-1,2&3	1300 South 500-600 West	$ 115,000	Roadway cleanup and repair and box culvert cleanup.

3-209-1,2&3	1300 South 600-700 West	$ 166,000	Roadway cleanup and repair and box culvert cleanup.
3-210-1,2&3	1300 South 700 West to the Jordan River	$ 569,000	Roadway cleanup and repair and box culvert cleanup.
3.1-1-1	One mile up Killian Canyon from Burr Fork	$ 50,000	Major slide could block creek causing dam and flooding.

4. PARLEY'S CANYON DRAINAGE AREA

4-1-1	1/2 Mile from Big Mountain Pass	$ 10,000	Erosion at roadside which may undermine roadway.
4-4-1	1 Mile from Big Mountain Pass	$ 5,000	Culvert plugged.
4-7-1 and 4-8-1	2 miles From Big Mountain Pass	$ 400,000	Rock slides and falling rocks possibly caused by surface runoff.
4-10-2	Affleck Campground	$ 5,000	Dirt road washed out.
4-12-1			Petroleum Pipeline undermined.
4-14-1	1200' from Pipeline Crossing	$ 2,000	Roadway beginning to wash out.
4-20-1	1700 East @ SLC Country Club	$ 5,000	Erosion at wingwalls.
4-21-1	1700 East @ Sugarhouse Park	$ 2,000	Erosion has exposed waterline and electrical cables.
4-22-1	Access Road @ Sugarhouse Park	$ 15,000	Culvert plugged - causing road damage.
4-25-1	Sugarhouse Detention Pond	$ 5,000	Undercutting concrete apron.

REMEDIAL REPAIR AREAS (Cont)

4-26-1 and 4-26-2	Sugarhouse Park	$ 10,000	Access road undercut.
4-27-1	1300 East @ Sugarhouse Park		Bank erosion and damaged power poles.
4-28-1	1200 East & Parley's	$ 12,000	Damaged trash racks and sedimentation build-up.
4-29-1	1989 South 945 East	$ 3,000	Road damage.
4.1-51-1&2*	From 1/4 Mile off I-84 About 4½ Miles Up Canyon	$ 860,000	About one-half total roadway is detroyed.
4.1-52-1*	Culvert Crossing at 4½ Miles Up Canyon	$ 15,000	Culvert is washed out 50' of 36"
4.1-54-1&2* 4.1-55-1&2* 4.1-56-1&2* 4.1-57-1&2 4.1-58-1&2 4.1-59-1&2 4.1-61-1&2	All Culvert Crossings	$ 105,000	Culverts and roadways are either washed out or will be before runoff is over.

5. MILLCREEK DRAINAGE AREA

5-24-1	Tracy Wigwam Scout Camp	$ 2,000	Concrete diversion has washed out and needs to be removed from the channel.
5-26-1	Bridge by Boy Scout Camp	$ 1,000	A tree has fallen into the channel.

5-41-2	3052 East 3500 South	$ 1,000	A private bridge is eroding and settling and may need to be removed.
5-49-2	500' Downstream of Oakwood Dr.	$ 5,000	A 4-foot diameter cottonwood has been undercut and is in danger of falling into the stream.
5-55-1	Evergreen Park	$ 1,000	Debris and erosion have damaged irrigation flume supports.
5-60-2	1495 Murphy Lane	$ 2,000	A tree has been undercut and may fall on the house on the opposite side of the stream.
5-103-1 5-106-3 5-107-2	Mill Creek Way between 1100 East and 900 East	$ 30,000	Sediment deposition on Mill Creek Way needs to be removed.

6. BIG COTTONWOOD DRAINAGE AREA

6-36-1 and 6-37-1	Wasatch Blvd. at 70th South	$ 24,000	Wasatch Blvd. near the mouth of Big Cottonwoo Canyon: The embankment and part of one lane has been eroded. Repair is needed to facilitate two lane traffic.
6-44-1	I-215 Crossing of Creek at about 2900 East and 6300 South	$ 15,000	I-215 crossing of Big Cottonwood Creek: Erosio of the newly-placed embankment has left a 50' high embankment 100 yards long. A large irrigation pipe is exposed. The erosion may effect the bridge design. Reestablishing stream channel will prevent further erosion and reduce the necessity for additional expensive fill and compaction.

7. LITTLE COTTONWOOD DRAINAGE AREA

7-9-2	2 miles from Tanner Gulch	$ 20,000	Culvert plugged with both ends covered. Area covered with sedimentation which will have to be removed.
7-16-1	Murray Power Plant	$ 10,000	Possible problems with siltation and debris causing overflow of banks in diversion structure of Murray Power Plant.
7-38-1	Approximately 7150 South 1200 East	$ 60,000	Bridge structure has minimal clearance.
7-41-2	7200 South	$ 1,000	Bridge at 7200 South: A storm drain outlet structure adjacent to the bridge is being undermined.
7-47-1	Approximately 1100 East 6850 South	$ 50,000	Old railroad trestle has minimal clearance.
7-64-1	Bridge at Wheeler Farm	$ 60,000	West abutment has been undermined. Continue erosion may send timber bridge into creek causing plugs downstream.
7-82-1	300' South of 5600 South Bridge	$ 100,000	Slope stabilization: The foundation of a home is at the edge of slope. Channel bank erosion at this location could present future problems.
7-90-1	Bridge at 5300 South	$ 125,000	Has marginal capacity. It could possibly plug and flood adjacent property owners.
7-91.1-1	Northwest corner of Murray Park	$ 40,000	Retaining wall at northwest corner of Murray Park footings are being undercut.
7-100-1	Bridge near Murray Park Swimming Pool	$ 60,000	Conveyance not adequate. There is a danger of it plugging.

8. DRY CREEK DRAINAGE AREA

No Remedial Repair

9. CORNER CANYON DRAINAGE AREA

9-4	13500 South 1300 East Draper	$ 3,000	Corner Canyon culvert under Draper Canal: Culvert is filling with sediment. If culvert becomes blocked, the Draper canal will be washed out.
9-5	600' South and 1200' East from NW corner Section 5 T4SR1E	$ 7,000	Sediment deposition is excessive and stream is at capacity. Sediment removal will protect several homes and farms that would be flooded if bank is overtopped.

10. ROSE CANYON DRAINAGE AREA

No Remedial Repair

11. BUTTERFIELD CANYON DRAINAGE AREA

No Remedial Repair

12. BINGHAM CANYON DRAINAGE AREA

No Remedial Repair

13. COON CANYON DRAINAGE AREA

No Remedial Repair

14. UPPER JORDAN DRAINAGE AREA

14-6-1	9400 South - Jordan River	$ 20,000	A 36-inch sewer is exposed by extreme channel bank erosion; water is flowing under and over pipeline.
14-10-2	7000 South - Jordan River	$ 2,000	Midvale sewer plant effluent channel is backed up and may cause flooding of effluent to adjacent mobile home park.
14-16-1	4900 South - Jordan River	$ 20,000	KLAF Radio Station is completely surrounded by water with no access except by boat.
14-26-1	3900 South - Jordan River	$ 100,000	Bridge on 3900 South Street has water four inches from the bottom of the bridge deck. Water is backing up. Increased flows may crest over roadway with possible damage to bridge.

15. LOWER JORDAN RIVER & SURPLUS CANAL

15.1-2-1	Railroad Crossing near 1700 South	$ 1,000	A telephone pole is lodged in the railroad bridge pilings near 1700 South.

16. BIG WILLOW DRAINAGE AREA

No Remedial Repair

SPECIAL FLOOD DAMAGE AREAS

"Special Flood Damage Areas" have been identified in each of the drainage areas. These are flood damage areas that should be given priority consideration by Salt Lake County and the various Cities, in regards to the design and construction of the necessary restoration improvements. The damage areas are organized by drainage area and include the following information from the field data assessment forms: identification number, address, cost estimate, and brief description of the damage and necessary restoration improvements.

In general, the "Special Flood Damage Areas" are characterized as extensive damage areas that will require significant money to restore the damage, a careful analysis of the method by which the damage should be repaired and constitute a significant threat to public and/or private property and life. It is recognized that each jurisdiction will likely place a different priority on these "Special Flood Damage Areas". However, it is recommended that these differences be thoroughly discussed and resolved in order that further damage does not occur as a result of another damaging rainfall/runoff event.

It should also be noted that several of the "Special Flood Damage Areas" are found on private property. These areas are identified because they generally represent a significant threat to public property or life. For example, several slide areas have been identified that should be evaluated and/or repaired so that the damage potential of these areas can be understood and appropriately resolved. These slide areas generally represent potential threats for plugging drainage channels or damaging roadways.

The field data contains many other damage areas that could have been included in the "Special Flood Damage Area" list. However, the Assessment Teams have attempted to unbiasly identify only those areas that they have determined to be very critical in order to protect property and life, irregardless of jurisdictional responsibilities.

SPECIAL FLOOD DAMAGE AREAS

I.D. No.	Address	Cost Estimate	Description
1. CITY CREEK DRAINAGE AREA			
1-2-1 to 1-17-1	Upper City Creek Canyon	$ 216,000	The upper one-third of the road in City Creek Canyon is completely washed out in numerous places and the roadway is extensively damaged for a total of about 1500 feet. One of the larger upper parks is covered with several feet of debris and the stream cuts through the middle of the park with a new channel.
1-20-1	City Creek Treatment Plant	$ 229,000	Structural, Mechanical & Civil damage to treatment plant facilities.
1-58-1	City Creek Canyon	$ 100,000	Telemetering to treatment plant is cut in several places and will probably have to be replaced.
1-59-2	City Creek @ Bonneville Drive	$ 509,000	There is erosion at the culvert under Bonneville Drive and a broken waterline to the treatment plant.
1-61-1	Top of Road to Memory Grove	$ 100,000	150 LF of road is washed out and waterline to treatment plant broken. Extensive shoring and filling are required to restore road.
1-73-1 thru 1-74-1	Memory Park Vicinity	$ 739,000	Road washout severely taking with it water and sewer lines and utility connections. Pond needs dredging to keep silt out of North Temple storm drain.

2. RED BUTTE DRAINAGE AREA

2-18-1	1040 East 1110 South	$ 40,000	Roadway along with culvert is washed out. Roadway is blocked.

3. EMIGRATION CREEK DRAINAGE AREA

3-5-1	400' West of Box 7800	$ 70,000	Creek has washed out several hundred feet of roadway and culvert.
3-6-1	1200' West of Box 7800	$ 50,000	Creek has washed out road from 3-5-1 to and including the culvert.
3-7-1	1800' West of Box 7800	$ 150,000	Roadway is washed out from 3-6-1 (10'-12' deep)
3-8-1	2300' East of Box 6939	$ 35,000	Several hundred feet of roadway is washed out, removal of sedimentation is required.
3-10-1&2	2000' East of Box 6939 Emigration	$ 6,000	Roadway was cut to assist drainage channel.
3-11-1,2,&3	1500' East of Box 6939 Emigration	$ 20,000	100' of roadway shoulder is washed away.
3-15-1&2	Box 6709 Emigration	$ 4,000	A portion of roadway has washed away.
3-20-2	Box 6655 Emigration	$ 20,000	Slope failure adjacent to creek could cause blocking of stream and flooding of homes.
3-21-1,2,3&4	Bus Turn Around Just West of Box 6655	$ 21,000	Roadway and Culvert are washed out.

SPECIAL FLOOD DAMAGE AREAS (Cont)

3-57-1	Sawyer Apartments	$ 300,000	Major slope failure between apartments and creek threatens to block stream.
3.2-2-1	500' of Little Mountain Summit on State Highway 65	$ 75,000	Slide has taken one-half of the roadway out.

4. PARLEY'S CANYON DRAINAGE AREA

4-2-1	1 Mile From Big Mountain Pass	$ 200,000	Slide area 300' long adjacent to the road.
4-3-1	1/2 Mile from Big Mountain Pass	$ 1,000	6' of concrete pipe washed out.
4-6-1	2 miles From Big Mountain Pass	$ 100,000	Mudslide. (Appears stable) Seepage is still occurring along slide area.
4-10-1	Affleck Campground	$ 10,000	Wood bridge washed out.
4-25-2	Sugarhouse Detention Pond	$ 290,000	Sedimentation
4.1-53-1*	1/4 Mile West of Main Gate	$ 10,000	Mud slide will block road and creek.
4.1-60-1&2	100 feet West of 4.1-59-1	$ 15,000	Roadway is washed out completely.

5. MILLCREEK DRAINAGE AREA

5-4-1	Elbow Fork Bend in Millcreek Canyon Road	$ 40,000	The road is in danger of being washed out near the culvert at the Elbow bend.
5-41-1	3054 East 3500 South	$ 125,000	Bridge has been destroyed and removed. Some utilities have appparently also been damaged.
5-45-2	3485 South 2700 East	$ 15,000	Diversion structure has been damaged and undercut.

SPECIAL FLOOD DAMAGE AREAS (Cont)

5-54-1	Evergreen Park	$ 50,000	Diversion structure has been undercut and destroyed.
5-103-6	Mill Creek Way Between 1100 East and 900 East	$ 30,000	Culvert crossing Christine Street has been removed and needs to be replaced.
5-103-7	Mill Creek Way Between 1100 East and 900 East	$ 30,000	Culvert crossing Catherine Street has been removed and needs to be replaced.
5-106-1	Same as Above	$ 135,000	Dredging of channel from 1100 East to 900 East is necessary.
5-103-1 5-106-3 5-107-2	Same as Above	$ 60,000	Mill Creek Way will need to be repaired and overlayed.

6. BIG COTTONWOOD DRAINAGE AREA

6-35-1 and 6-35-2	Holladay Cottonwood Road Near 70th South	$ 60,000	Murray Spring Area: Erosion is endangering springs and structures and some contamination is occuring. Stream needs to be rechanneled and structures and associated facilities need some structural repair.
6-31-1 6-31.1-1 6-32-1	Mouth of Big Cottonwood Canyon	$ 713,000	Big Cottonwood Water Treatment Plant bank stabilization and erosion control is needed and repair of the bypass channel is required. Internal damage has occurred to the plant facilities.
6-12-1	Turn-off to Doughnut Falls in Big Cottonwood Canyon	$ 35,000	Mud slide needs to be stabilized adjacent to the road up Big Cottonwood Canyon.

6-41-1	200 Yards West of 30th East Bridge over Big Cottonwood Canyon	$ 15,000	Diversion Structure and Green-Tanner Ditch Repair of the washed structure and adjacent section of fill is needed so that irrigation water can be diverted.

7. LITTLE COTTONWOOD DRAINAGE AREA

7-18.1-1	Wasatch at 9400 South	$ 60,000	Bridge removed 300' downstream of stone bridge on Little Cottonwood Canyon Road.
7-19.1-1	3250 East Alta Hills Drive	$ 120,000	Outlet structure is undermined and could possibly wash out road. Channel banks near homes are unstable.
7-31-1	Willow Creek Country Club	$ 100,000	Bank erosion is severe causing extensive damage to private property along the Willow Creek Country Club.
7-36-1	7247 South 1300 East	$ 150,000	Excessive sedimentation has occurred. There is a history of flooding private property in this area at the bridge at 7247 South 1300 East.
7-42-1 and 7-54-1	1100 East 6600 South	$ 150,000	Bridge at 1100 East and 6600 South: North side of bridge appears to be settling. Wingwall has separated on the west.
7-55.1-1	Approx. 6500 South 1100 East	$ 100,000	Canal diversion structure has been washed out at approximately 6500 South and 1100 East.
7-78-1	Bridge at 5600 South	$ 6,000	West retaining wall is held in place by a power pole wedged between wingwalls.
7-111-1	Rio Grande Western Railroad at approximately 200 West	$ 60,000	One culvert flowing to full capacity at moderate stream flows. Possible plug may occur. Suggest boring an additional culvert.

7-115-2	Bridge at 360 West	$ 125,000	Bridge is undersized and floods the road.

8. DRY CREEK DRAINAGE AREA

No Special Damage

9. CORNER CANYON DRAINAGE AREA

No Special Damage

10. ROSE CANYON DRAINAGE AREA

No Special Damage

11. BUTTERFIELD CANYON DRAINAGE AREA

No Special Damage

12. BINGHAM CANYON DRAINAGE AREA

No Special Damage

13. COON CANYON DRAINAGE AREA

No Special Damage

14. UPPER JORDAN DRAINAGE AREA

14-1-1	Narrows - Jordan River	$ 300,000	There is a 100 foot span railroad bridge failure located at the Jordan Narrows.

14-12-1	5600 South Jordan River	$ 150,000	Bullion Road Bridge has abutment fill failure. Structure is closed. Further flooding may produce total abutment failure.
14-23-1	5300 South to 4500 South	$ 475,000	Extensive sedimentation required to be removed to increase channel capacity.
14-28-1	4200 South to 3500 South	$ 400,000	Extensive sedimentation required to be removed to increase channel capacity.
14-29-1	3500 South to 3300 South	$ 450,000	Extensive sedimentation required to be removed to increase channel capacity.

15. LOWER JORDAN DRAINAGE AREA

No Special Damage

16. BIG WILLOW DRAINAGE AREA

No Special Damage

ATTACHMENT “G”

Sewer Facilities Damaged

by: Frank Sconfienza

Emigration Canyon

Replace 607 feet of 8-inch sewer line
Replace 400 feet of 12-inch storm sewer

Memory Grove (Parks Department)

Approximately 18 sewer laterals will need to be replaced with cast iron pipe

Sugarhouse Park

600 feet of 8-inch sewer line needs to be cleaned

Need to Clean:

Sewer line from 900 to 1300 South, Main Stret to 700 West (Sewer Maps 31, 32, 35)

North Temple to the river from 300 West to 500 North (Books 16, 17, 26,27,51)

Canyon Road, Memory Grove to North Temple at State Street; clean and televise

Eight-inch lines from North Temple to 800 South on State Street, both sides

FLOOD DAMAGE

By: Scott Haslam

Emigration

1. Approximately one mile above the mouth of the canyon: Emigration tunnel water line connection to 16-inch waterline at creek crossing damaged and 16-inch valve installed to protect pipeline washout below

2. Approximately one-half mile above the mouth of the canyon adjacean to tthe slide by condominiums (Sawyer): 12-inch pipeline replaced due to road washout

3. Emigration Road and Hogle Zoo: 12-inch pipeline at creek crossing appears to have partially collapsed or broken muddy water found inside pipe.

City Creek

1. Mouth of City Creek across road from caretaker's house: Connection from Morris ovaerflow line to 24-inch culinary in bottom of creek - possibly damaged

2. Below junction of Bonneville Boulevard and Memory Grove top road: Slide pushing on road where the three culinary pipelines come together out of City Creek Canyon.

3. Brick tank and Memory Grove road: Creek washing out footings of old brick tank structure - Possible damage to overflow line and connections.

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Possible damage to hydrants, mains, valve boxes and valves due to silt washing and heavy equipment working around utilities at the following addresses:

1. 1100 South McClelland Street
2. 1100 South 1100 East
3. Yale Avenue, 13th East to 9th East
4. Harvard Avenue, 11th to 9th East
5. 13th South, north side, 11th East to 5th East
6. 13th South, north and south sides, 5th East to Jordan River
7. West Temple, 13th South to 1100 South
8. 300 West, 13th South to 1100 South
9. 400 West, 13th South to 1100 South
10. North Temple, 3rd West to Jordan River
11. 10th West, North Temple to 100 North
12. 13th South 900 West - 6-inch