# 2019 Nevada Transportation Conference
# North Truckee Drain Relocation


**By**

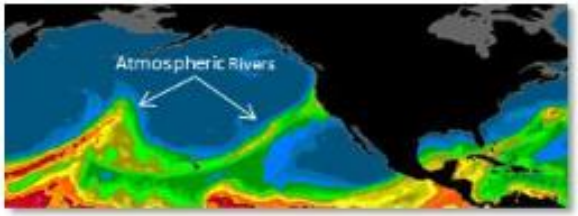
**Noel Laughlin, PE**


# Truckee River

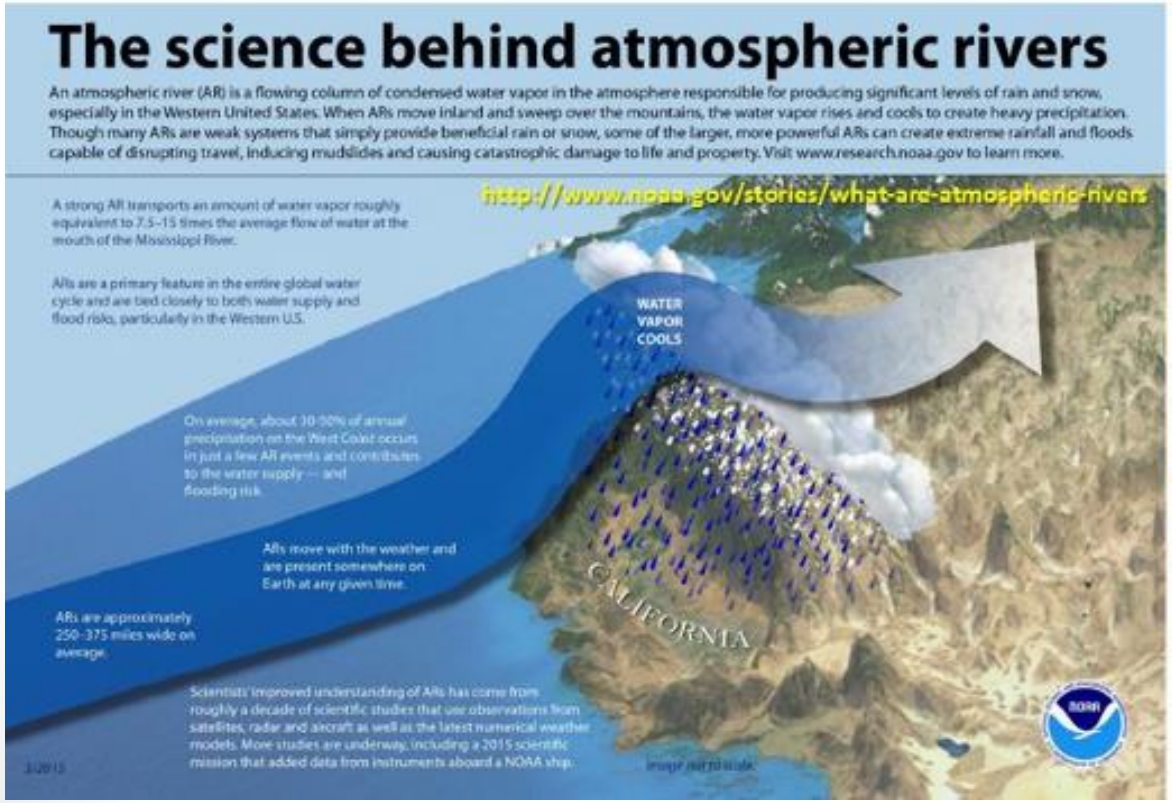
# What's an Atmospheric River?

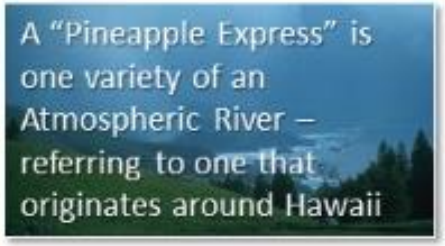
National Weather Service
Los Angeles/Oxnard, CA
weather.gov/losangeles

- ✓ A long and narrow flowing column of water vapor in the atmosphere
- ✓ The term "Atmospheric River" was first coined in a 1998 research publication
- ✓ A primary feature of the entire global water cycle
- ✓ Responsible for 30-50% of all annual precipitation in the U.S. west coast
- ✓ Thanks to more than a decade of scientific studies using new satellite, radar, aircraft, and other observations, we know much more about them today




The graphic above shows amounts of atmospheric water vapor as seen by satellite, with the green through red colors showing higher amounts of water vapor. Note the long and narrow streams of high water vapor content stretching across the Pacific Ocean, one stretching from Hawaii to the west coast of North America. These are Atmospheric Rivers.

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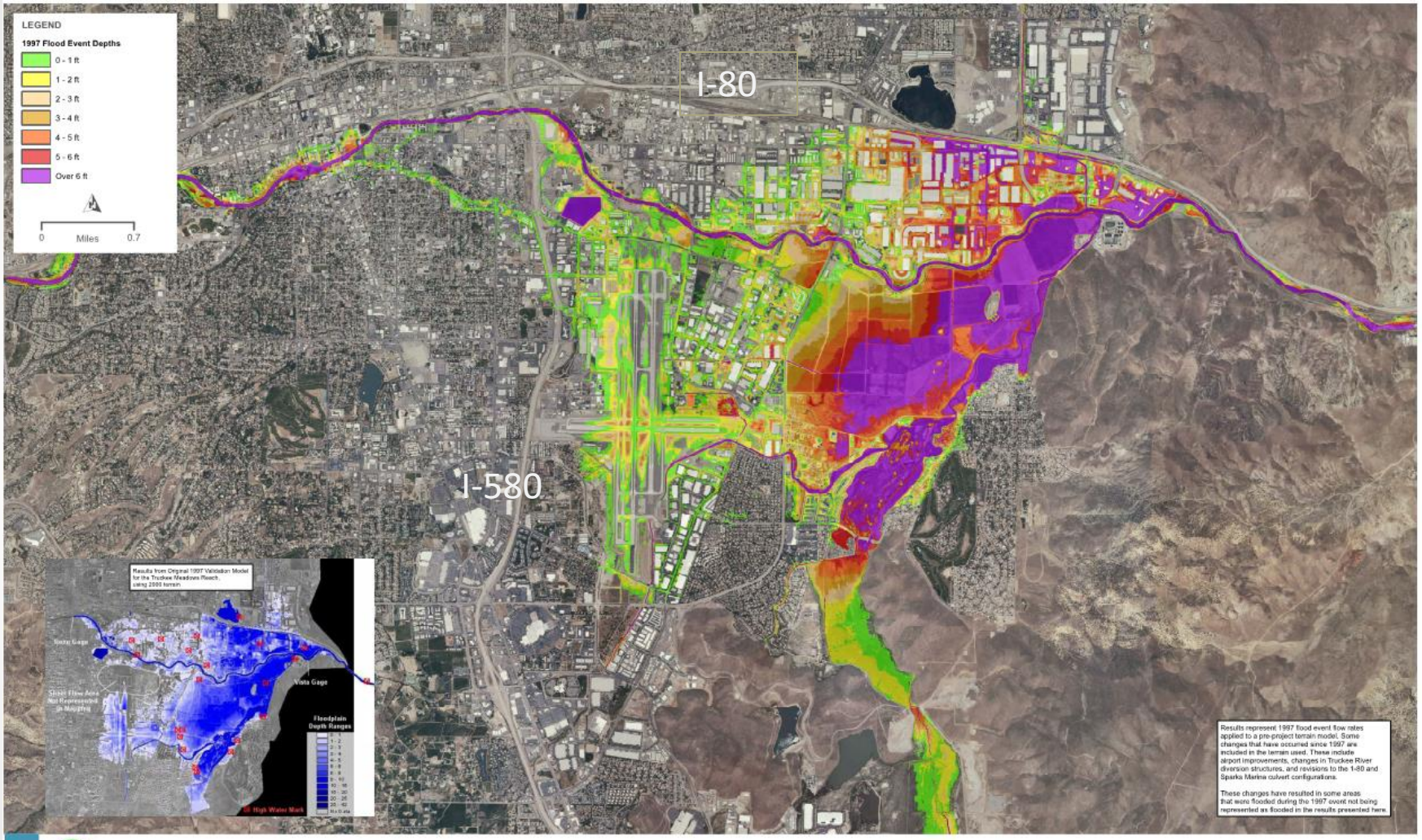
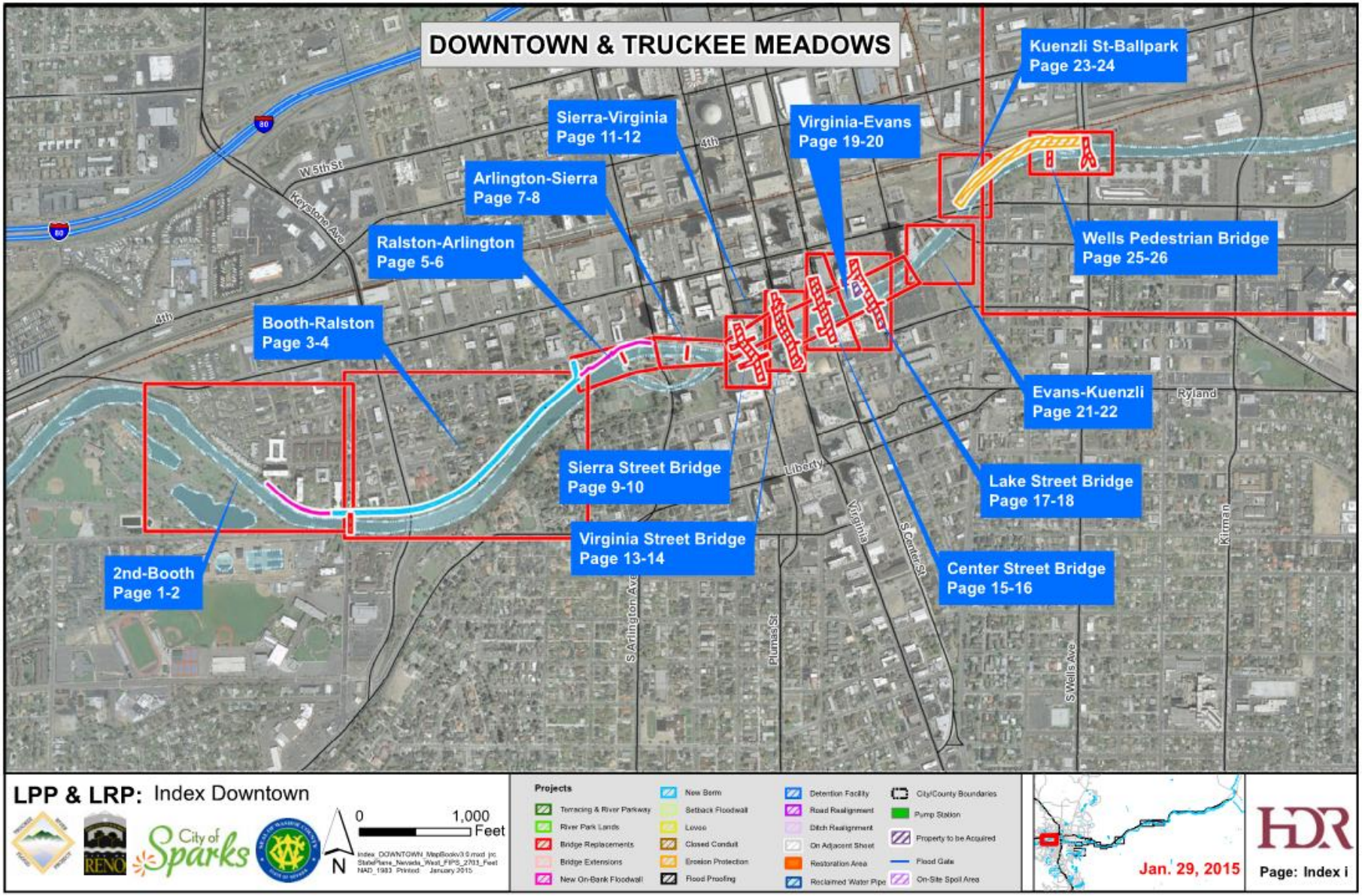



1997 VALIDATION HEC-RAS MODEL RESULTS

# 1997 Flooding in the Sparks Industrial Area

Photo by John Glancy,  USGS


DOWNTOWN & TRUCKEE MEADOWS
Kuenzli St-Ballpark
Page 23-24
Sierra-Virginia
Page 11-12
Virginia-Evans
Page 19-20
Arlington-Sierra
Page 7-8
Wells Pedestrian Bridge
Page 25-26
Ralston-Arlington
Page 5-6
Booth-Ralston
Page 3-4
Evans-Kuenzli
Page 21-22
Sierra Street Bridge
Page 9-10
Lake Street Bridge
Page 17-18
Virginia Street Bridge
Page 13-14
Center Street Bridge
Page 15-16
2nd-Booth
Page 1-2
W 5th St
Keystone Ave
4th
Liberty
Virginia
S Center St
S Arlington Ave
Plumas St
S Wells Ave
Ryland
Kitman
LPP & LRP: Index Downtown
City of Sparks
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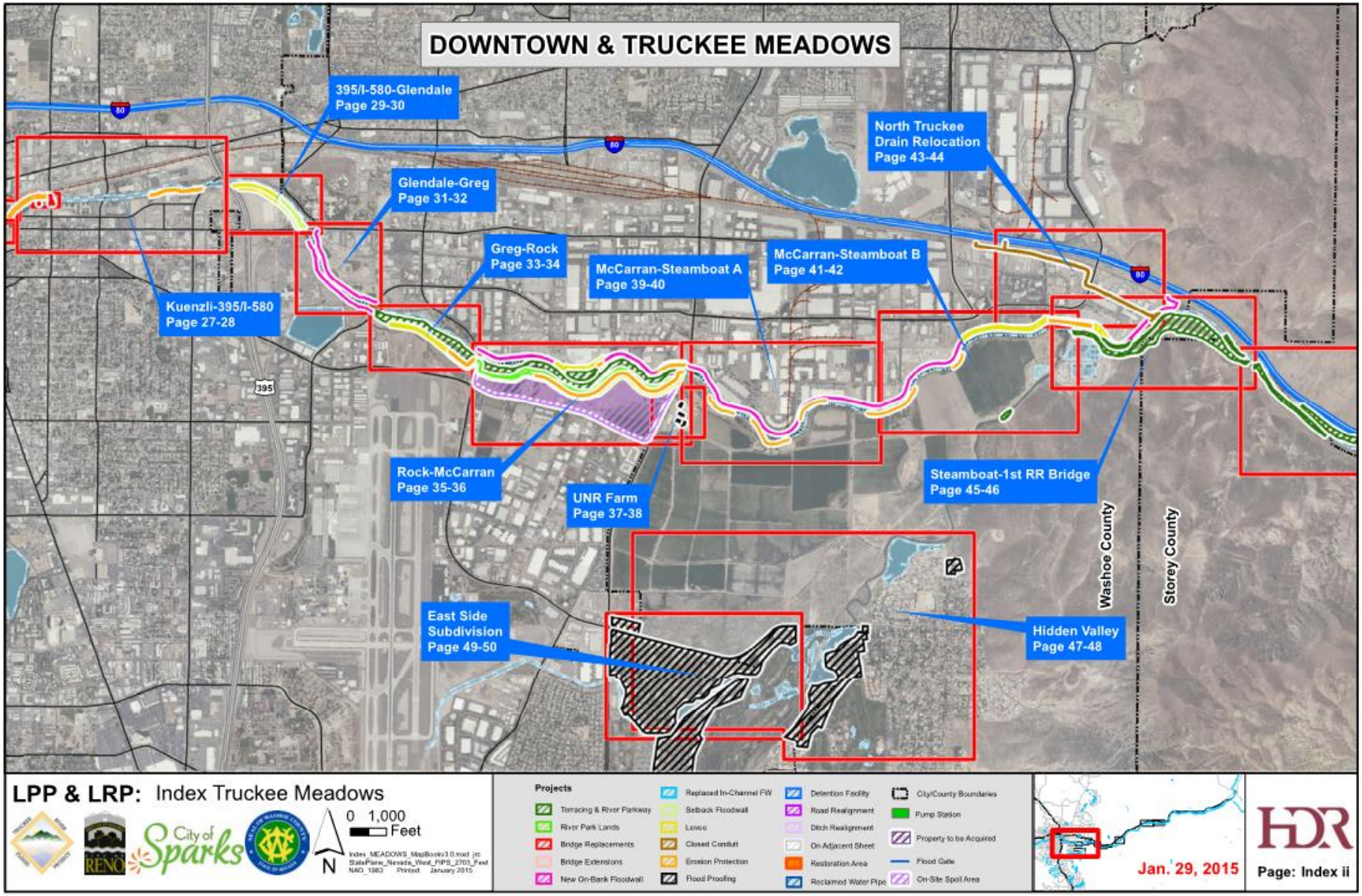
1,000
Feet
N
Projects
Terracing & River Parkway
River Park Lands
Bridge Replacements
Bridge Extensions
New On-Bank Floodwall
New Berm
Setback Floodwall
Levee
Closed Conduit
Erosion Protection
Flood Proofing
Detention Facility
Road Realignment
Ditch Realignment
On Adjacent Sheet
Restoration Area
Reclaimed Water Pipe
City/County Boundaries
Pump Station
Property to be Acquired
Flood Gate
On-Site Spoil Area
Jan. 29, 2015
HDR
Page: Index i


DOWNTOWN & TRUCKEE MEADOWS
395/I-580-Glendale
Page 29-30
Glendale-Greg
Page 31-32
Greg-Rock
Page 33-34
McCarran-Steamboat A
Page 39-40
McCarran-Steamboat B
Page 41-42
North Truckee
Drain Relocation
Page 43-44
Kuenzli-395/I-580
Page 27-28
Rock-McCarran
Page 35-36
UNR Farm
Page 37-38
Steamboat-1st RR Bridge
Page 45-46
East Side
Subdivision
Page 49-50
Hidden Valley
Page 47-48
Washoe County
Storey County
395
80
LPP & LRP: Index Truckee Meadows
0 1,000
Feet
N
Projects
Terracing & River Parkway
River Park Lands
Bridge Replacements
Bridge Extensions
New On-Bank Floodwall
Replaced In-Channel FW
Setback Floodwall
Levee
Closed Conduit
Erosion Protection
Flood Proofing
Detention Facility
Road Realignment
Ditch Realignment
On Adjacent Sheet
Restoration Area
Reclaimed Water Pipe
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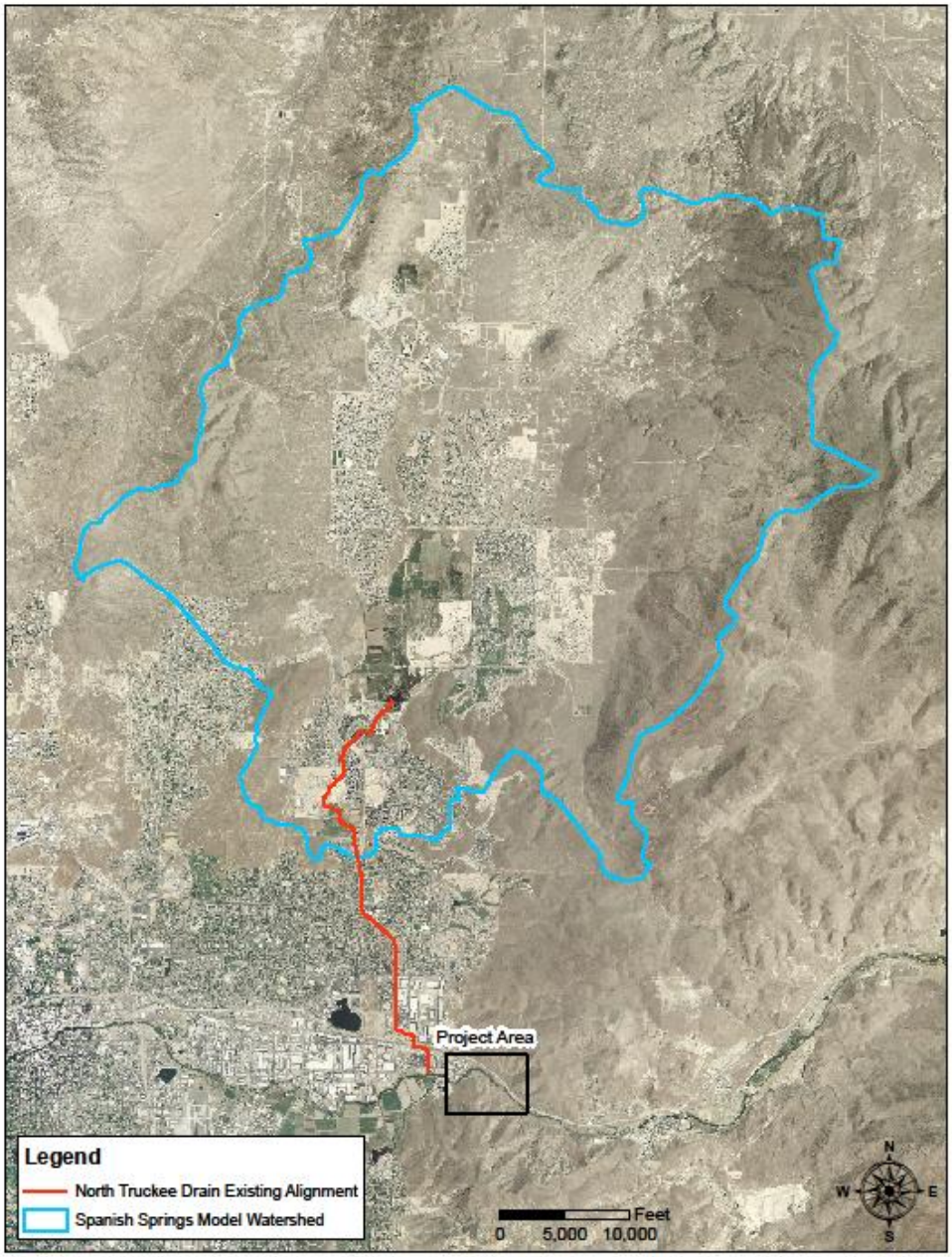
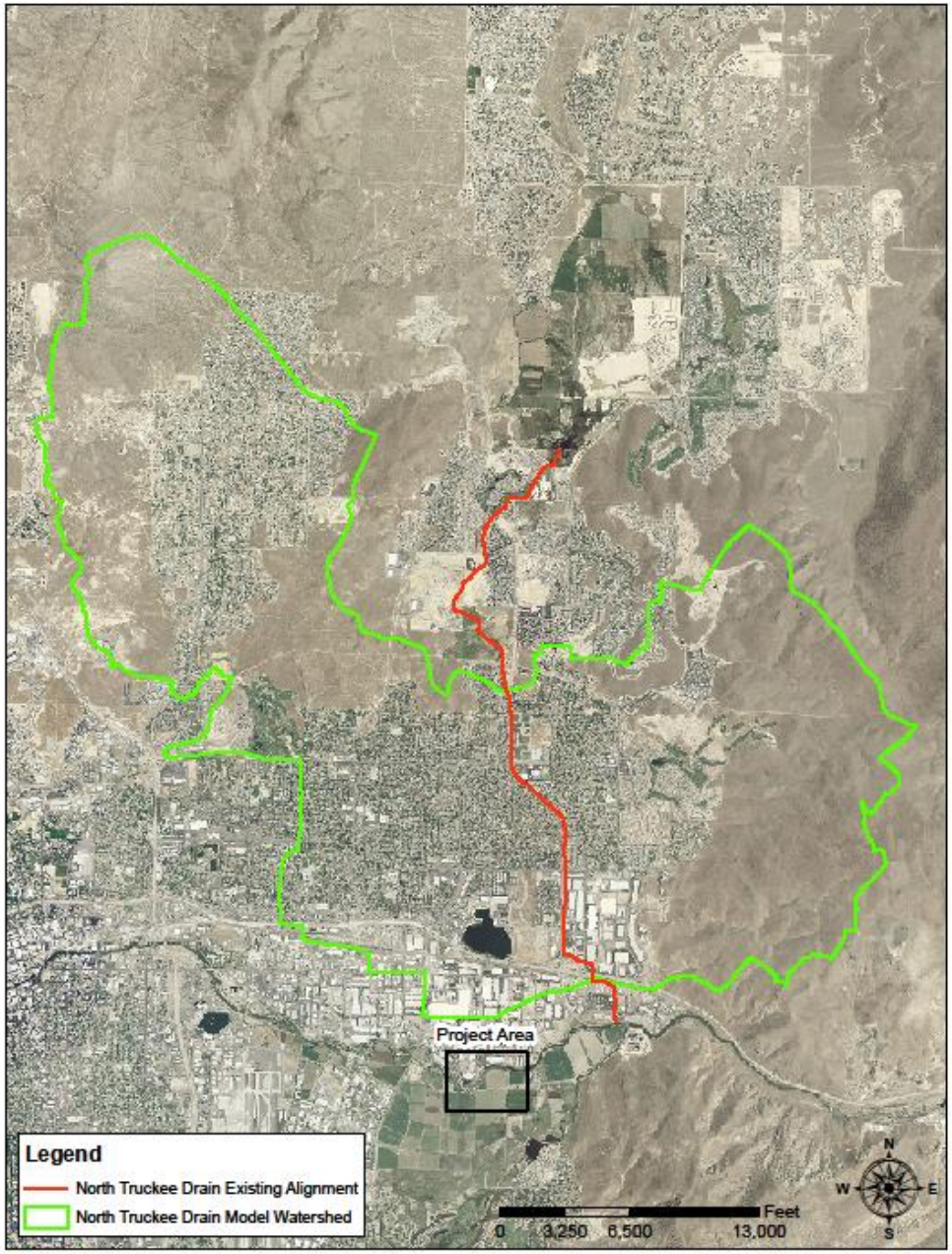
Pump Station
Property to be Acquired
Flood Gate
On-Site Spoil Area
Jan. 29, 2015
HDR
Page: Index ii




**Spanish Springs Watershed Map**
FIGURE 5

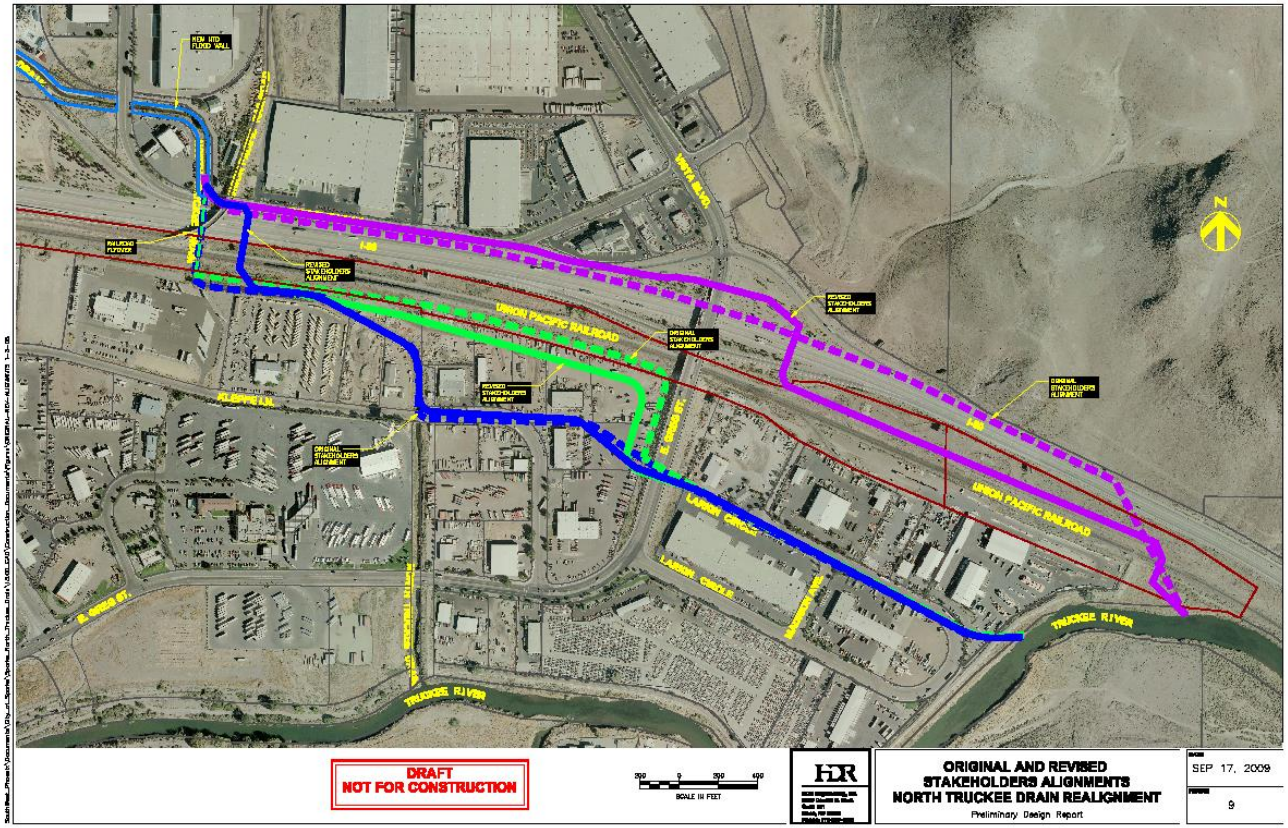
HDR
ONE COMPANY | Many Solutions

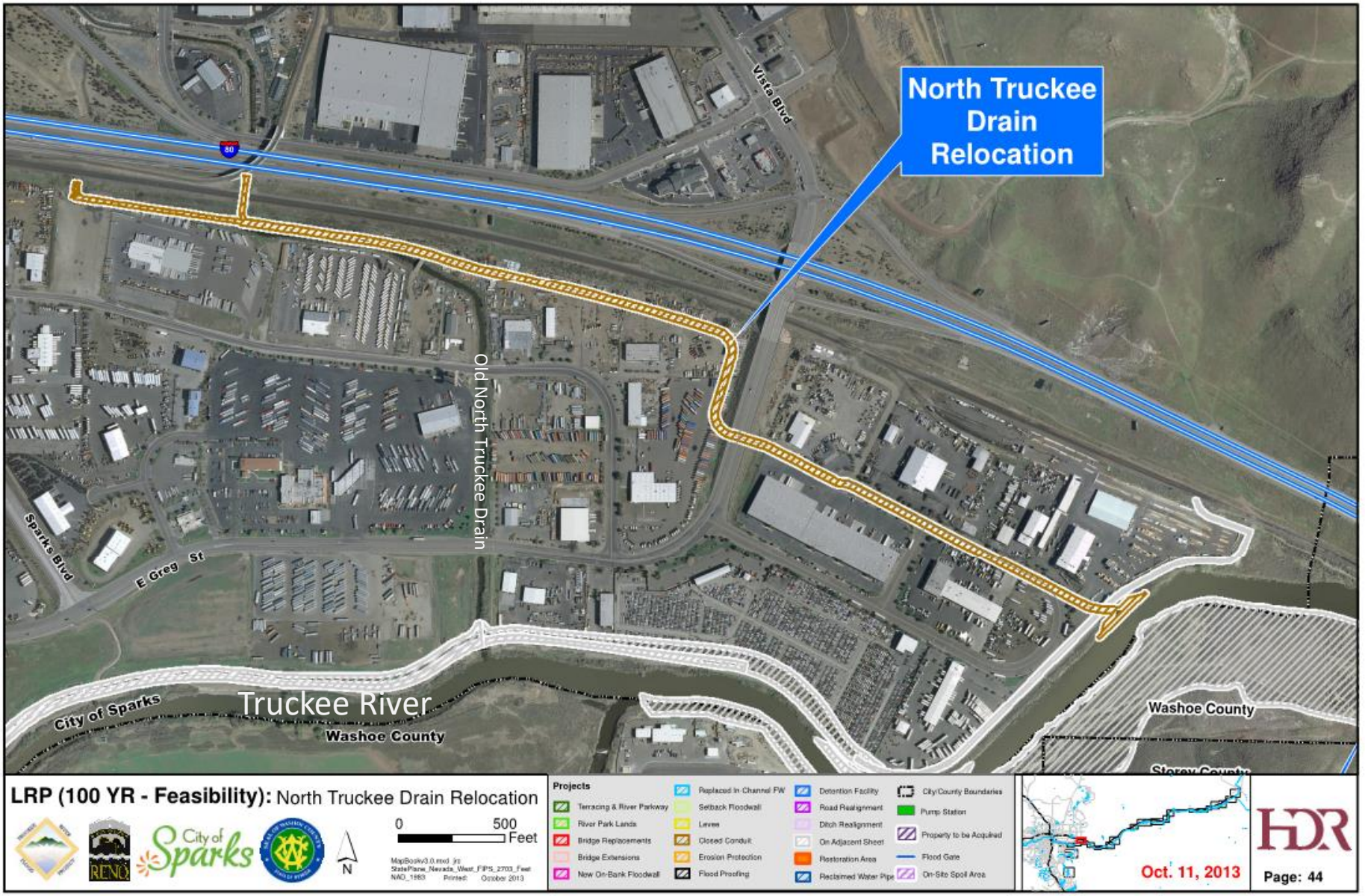



**North Truckee Drain Watershed Map**
FIGURE 6

HDR
ONE COMPANY | Many Solutions

# Stakeholder Process




North Truckee Drain Relocation
Vista Blvd
I-80
Old North Truckee Drain
Sparks Blvd
E Greg St
City of Sparks
Truckee River
Washoe County
Washoe County
Storey County
LRP (100 YR - Feasibility): North Truckee Drain Relocation
City of Sparks
RENO
0
500
Feet
N
Projects
Terracing & River Parkway
River Park Lands
Bridge Replacements
Bridge Extensions
New On-Bank Floodwall
Replaced In-Channel FW
Setback Floodwall
Levee
Closed Conduit
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Restoration Area
Reclaimed Water Pipe
City/County Boundaries
Pump Station
Property to be Acquired
Flood Gate
On-Site Spoil Area
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HDR
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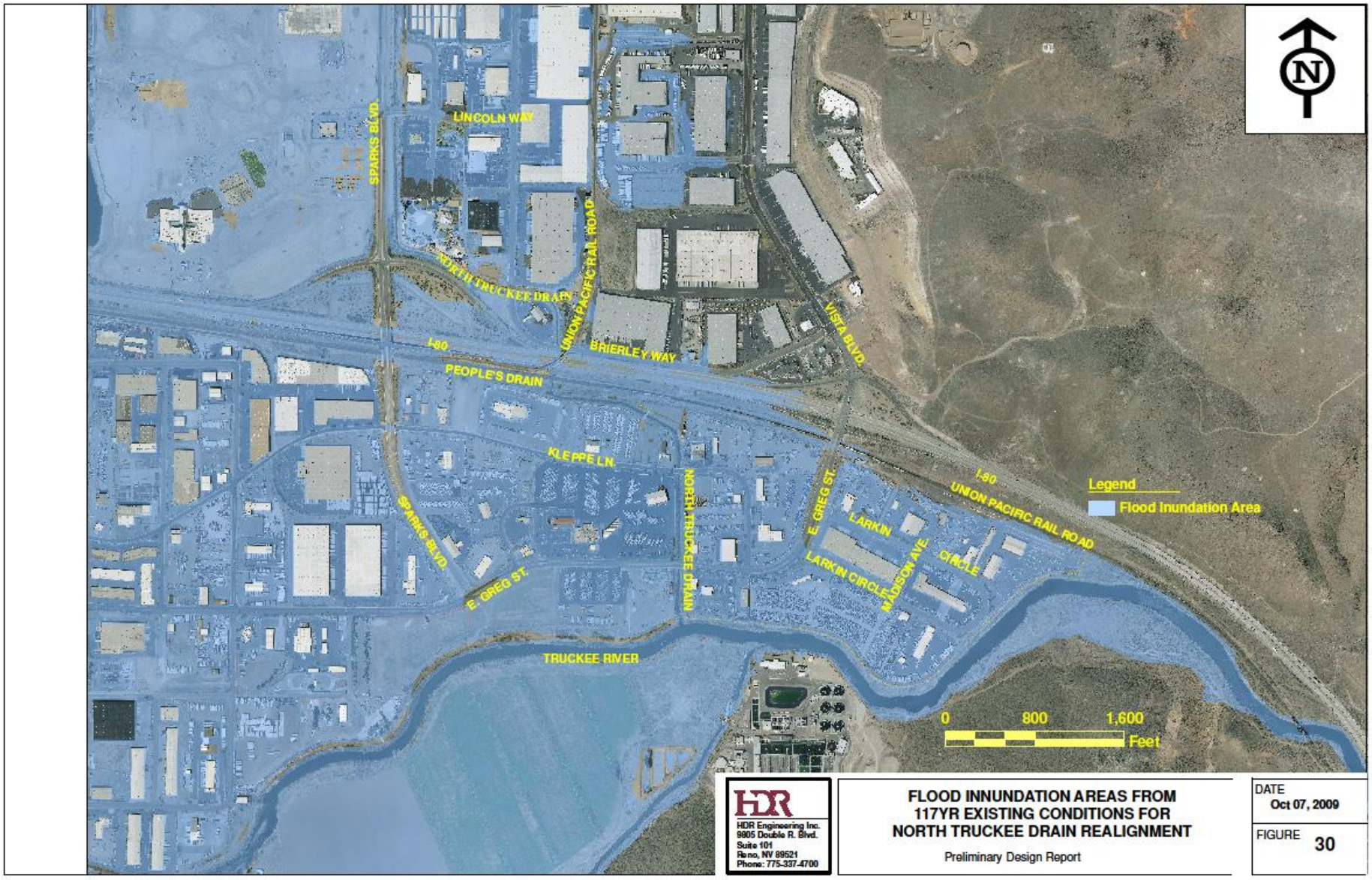



HDR
HDR Engineering Inc.
9905 Double R. Blvd.
Suite 101
Reno, NV 89521
Phone: 775-337-4700

**FLOOD INNUNDATION AREAS FROM 117YR EXISTING CONDITIONS FOR NORTH TRUCKEE DRAIN REALIGNMENT**

Preliminary Design Report

DATE Oct 07, 2009

FIGURE 30


HDR
HDR Engineering Inc.
9805 Double R. Blvd.
Suite 101
Reno, NV 89521
Phone: 775-337-4700

**FLOOD INNUNDATION AREAS FROM 117-YR STAND ALONE MODEL FOR NORTH TRUCKEE DRAIN REALIGNMENT**

Preliminary Design Report

DATE Oct 07, 2009

FIGURE 31


HDR Engineering Inc.
8806 Double R. Blvd.
Suite 101
Reno, NV 89521
Phone: 775-337-4700

**FLOOD INNUNDATION AREAS FROM 117 YR LPP PROJECT BUILDOUT FOR NORTH TRUCKEE DRAIN REALIGNMENT**

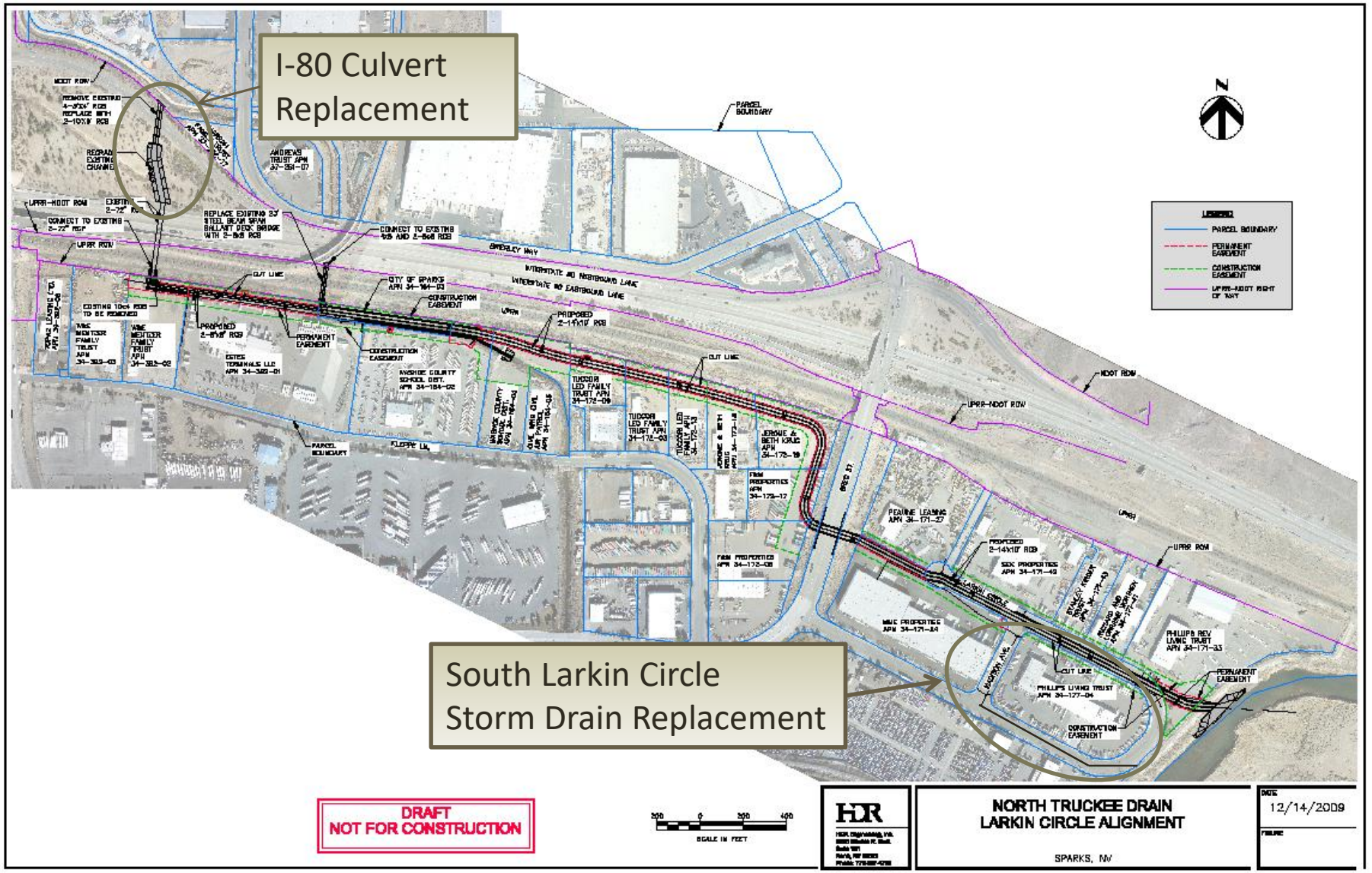
Preliminary Design Report

DATE Oct 07, 2009

FIGURE 32

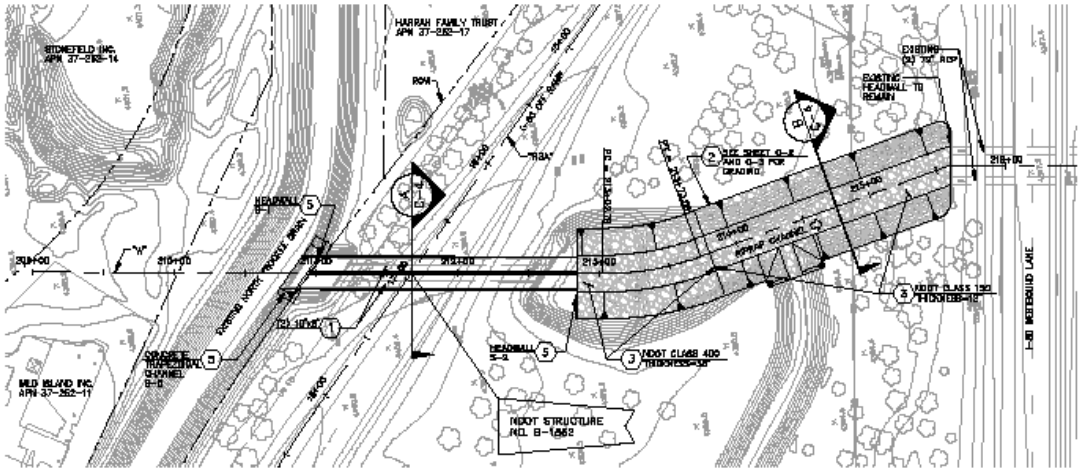
# North Truckee Drain
# Major Components

- Culvert Replacement for Sparks Blvd Offramp
- Wetlands Mitigation
- 4,700 LF of Double 14’ X 10’ RCB
- 930 LF of 14’ X 8’ RCB
- 3,000 LF of Parallel Storm Drain
- Reconstruction of Greg Street from Larkin Circle to the I-80/Vista Blvd. Interchange


I-80 Culvert Replacement
South Larkin Circle Storm Drain Replacement
DRAFT
NOT FOR CONSTRUCTION
HDR
NORTH TRUCKEE DRAIN
LARKIN CIRCLE ALIGNMENT
SPARKS, NV
12/14/2009

# I-80/Sparks Blvd Offramp Culvert Major Components

- 191 LF of Double 10’ X 6’ RCB
- 1,200 CY of Riprap Channel Lining
- New Tie Into the NTD Channel
- New Outlet Headwall



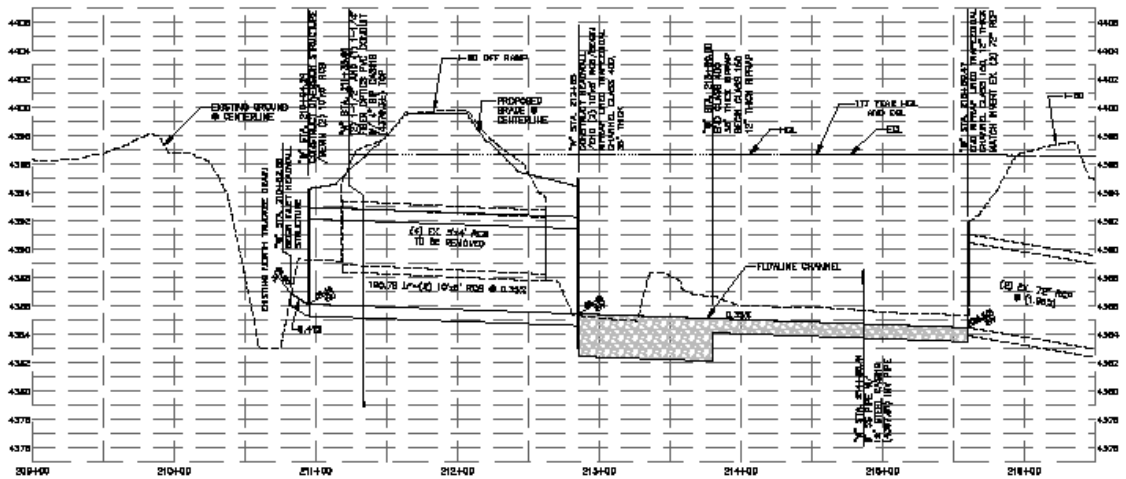

DRAINAGE NOTES:

1. INSTALL STORM DRAIN RCB, SIZE AS SHOWN ON PLAN PER DETAIL 1, SEE SHEET C-5.
2. CONSTRUCT TRAPEZOIDAL CHANNEL. SEE DETAIL 2, SHEET C-5.
3. INSTALL RIPRAP, SIZE AND THICKNESS AS SHOWN ON PLAN.
4. CONSTRUCT STRUCTURE PER "A" SHEET# AS NOTED.
5. CONSTRUCT CONFLUENCE STRUCTURE PER "A" SHEET# AS NOTED.

THIS IS A GENERAL LIST. NOT ALL ACTIVITIES ARE USED.

NOTES:

1. PROTECT EXISTING FEATURES IN PLACE UNLESS NOTED OTHERWISE.
2. SEE SHEETS HD-1 AND HD-2 FOR HORIZONTAL CONTROL.
3. SEE SHEETS C-2 AND C-3 FOR SURFACE GRADING AND DRAINAGE.




Call before you Dig 1-800-227-2600

Call before you Overhead! 775-834-7590

NTD - CHANGE ORDER 6 TO NDOT CONTRACT 3565

PLAN AND PROFILE
"A" STA 209+00 TO STA 216+00

CITY OF SPARKS, NEVADA, PUBLIC WORKS DEPARTMENT

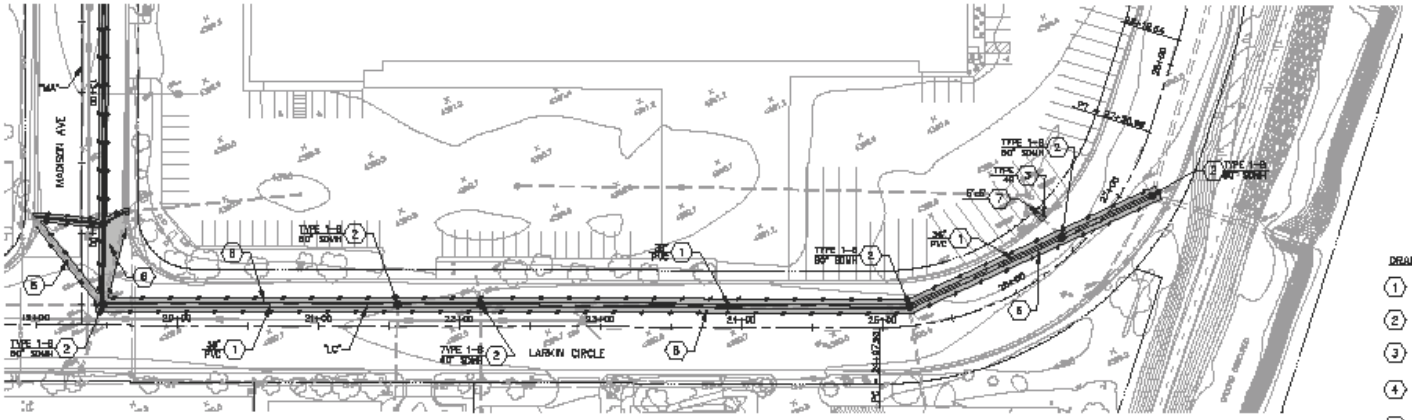
SHEET No C-1

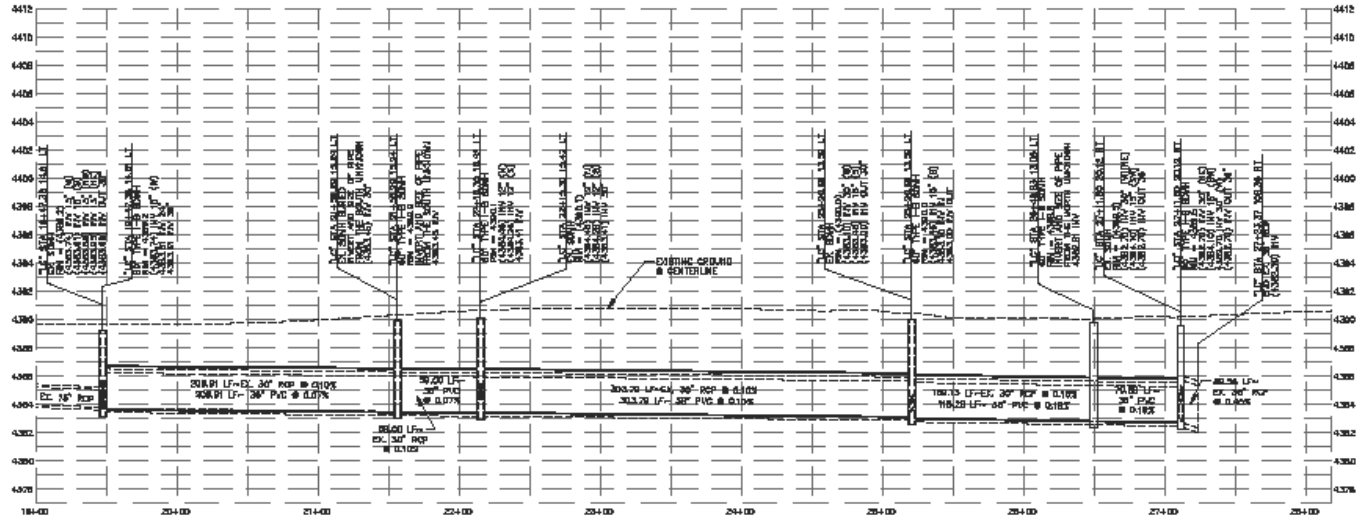
SHT 5 OF 15


DEERE

# South Larkin Circle Storm Drain Major Components

- 762 LF of 36-inch RCP
- 365 LF of 24-inch RCP
- 5 Drop Inlet Replacements




SCALE IN FEET

DRAINAGE NOTES :

1. INSTALL STORM DRAIN PIPE, SIZE AND TYPE AS SHOWN ON PLAN.
2. CONSTRUCT MANHOLE, SIZE AND TYPE AS SHOWN ON PLAN.
3. CONSTRUCT DROP INLET, SIZE AND TYPE AS SHOWN ON PLAN.
4. CONSTRUCT TYPE 3 P.C.C. ROLL CURB AND GUTTER PER DETAIL 1, SHEET C-3. LOCATION AND LENGTH PER SHEET HC-1.
5. LATERAL CONNECTION PER DETAIL 14, SHEET C-4.
6. CONSTRUCT AC PAVEMENT PATCH PER DETAIL 2, SHEET C-3.
7. CONSTRUCT CONCRETE PATCH SIZE AS SHOWN ON PLAN PER DETAIL 16, SHEET C-4.

THIS IS A GENERAL LIST. NOT ALL ACTIVITIES ARE USED.

NOTES:

1. PROTECT EXISTING FEATURES IN PLACE UNLESS NOTED OTHERWISE.
2. MANHOLE INVERT ELEVATIONS SHOWN ARE TO CENTER OF MANHOLE.
3. STORM DRAIN LENGTHS SHOWN ON PROFILES ARE FROM CENTER OF MANHOLE/DROP INLET TO CENTER OF MANHOLE/DROP INLET.

Call before you Dig 1-800-227-2600

SAFETY ALERT
Call before you Overhead
775-834-7590
NV Energy Overhead Line Before, After Under Excepted

DESIGNED BY: PEG
DRAWN BY: PEG
CHECKED BY: RL
APPROVED BY:
SCALE: HORIZ. 1"=40' VERT. 1"=4'
FIELD BOOK:

| REV No | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|

HDR Engineering, Inc. 5440 Kietzke Lane, Suite 100 Reno, NV 89511 Phone: 775-851-4700

The City of Sparks

MADISON AVENUE AND SOUTH LARKIN CIRCLE
STORM DRAIN REPLACEMENT
STORM DRAIN PLAN AND PROFILE
SOUTH LARKIN CIRCLE
CITY OF SPARKS, NEVADA, PUBLIC WORKS DEPARTMENT

75% SUBMITTAL
NOT FOR CONSTRUCTION
MARCH, 2010

SHEET No
C-2

SHT OF

# Wetlands Mitigation

- Regraded and Realigned 3,150 ft of channel
- Construction Competed in 2013 by RTC Construction for $447K
- Wetlands Mitigation Design

# Wetlands Mitigation


# Construction

- Construction in 3 Phases
- Q&D Awarded $9.1M Contract for Phase 1
- Phase 1 Given NTP on January 12, 2014
- Phase 2 Was Constructed as Part of a $3.4M Change Order
- Phase 3 Was Awarded to Q&D for $14.1M in January 2017 and was completed in 2018

# Construction

- Cast in Place Construction
- Completing 40 ft Every Other Day
- High-Early Concrete
- Pre-tied Reinforcing Mats
- Slide Rail Shoring System
- Traveling Form System

# Slide Rail Shoring System

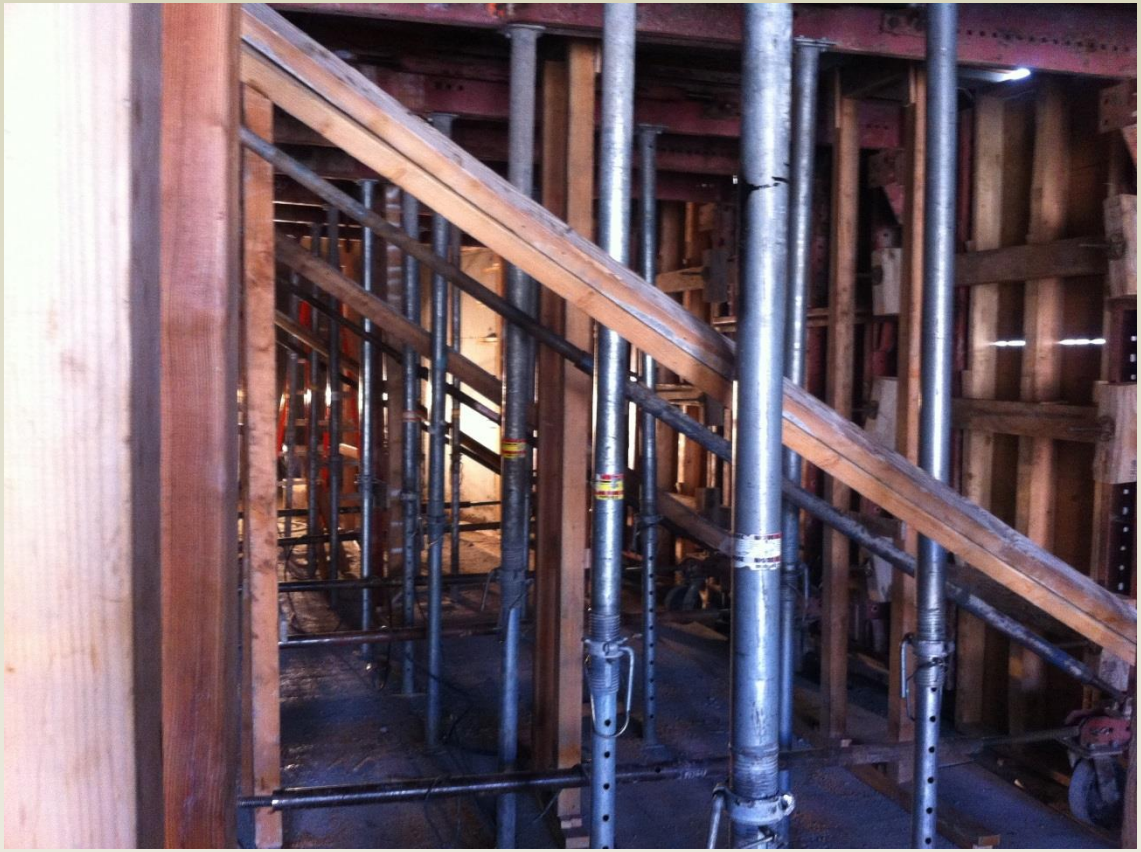
# Slide Rail Shoring System

# Slide Rail Shoring System

# Slide Rail Shoring System

# Traveling Form System

# Traveling Form System



# Traveling Form System

# Gantry System

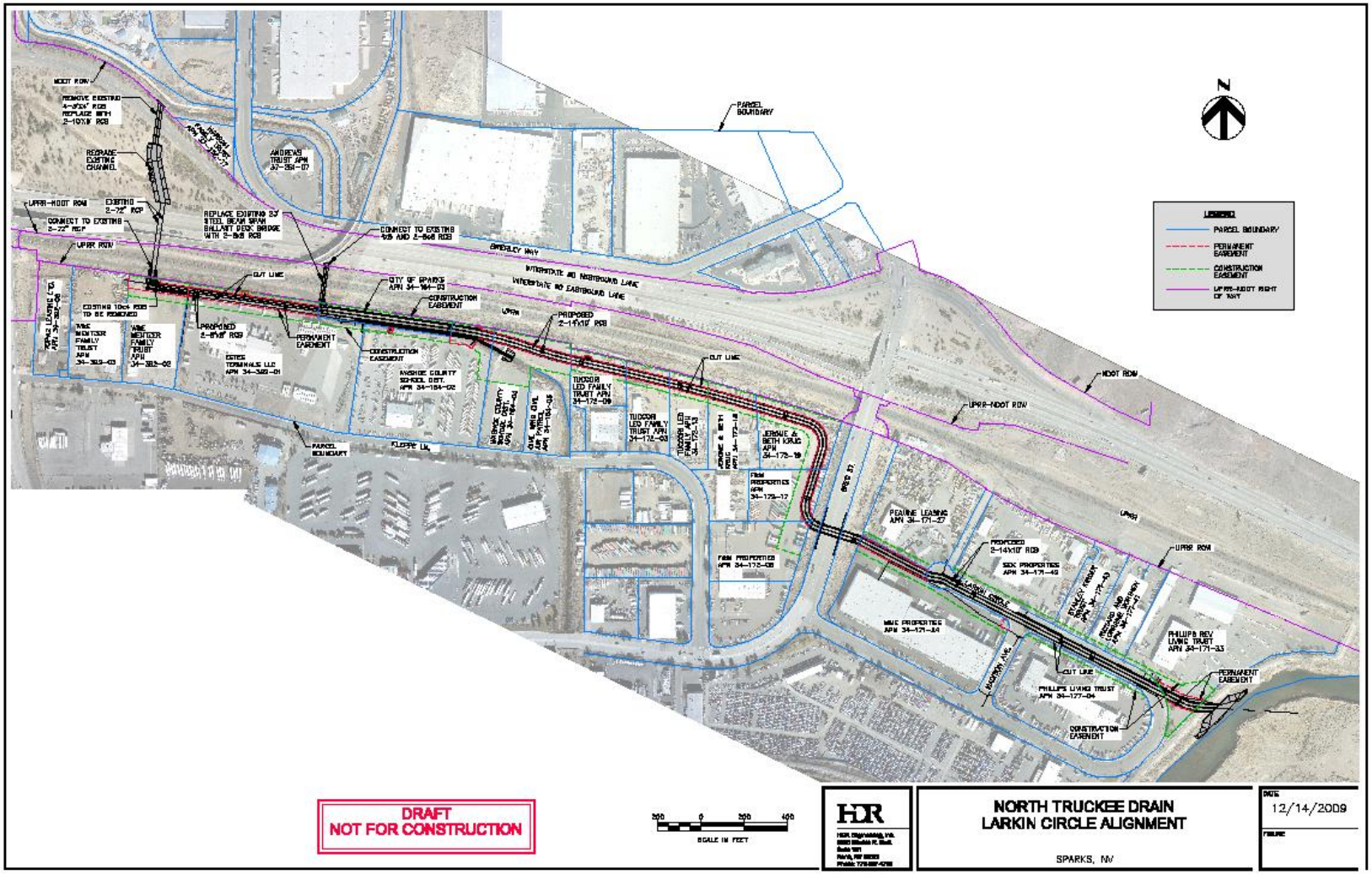
# Traveling Form System

- Curved Alignment

# Greg Street Crossing

# Truckee River Outlet

# North Truckee Drain Relocation



# Questions