CEEn-2019CPST-005

Bluffdale City GIS Stormwater Model

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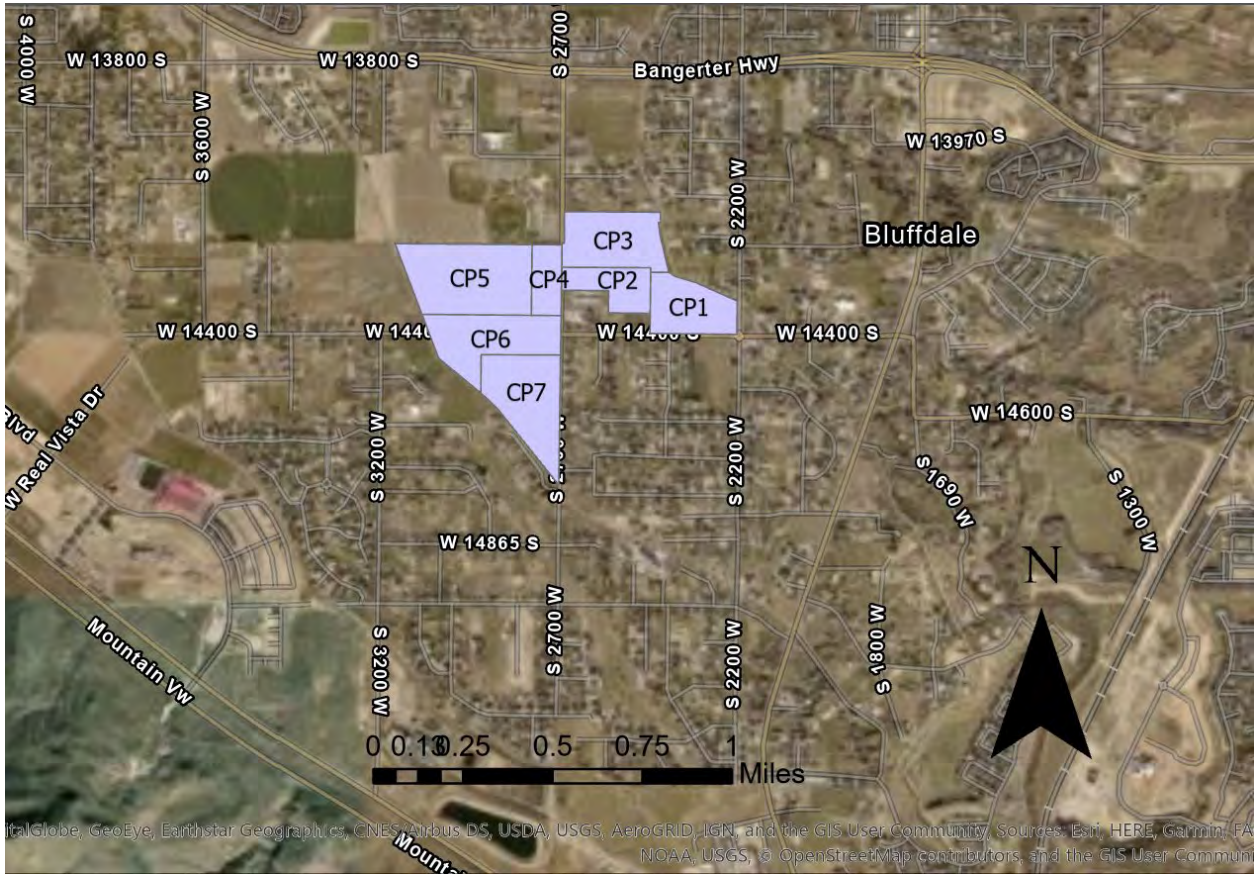
This is a representation of the tools utilized in the project. We were not sponsored by these companies

Introduction



Project Tasks and Deliverables

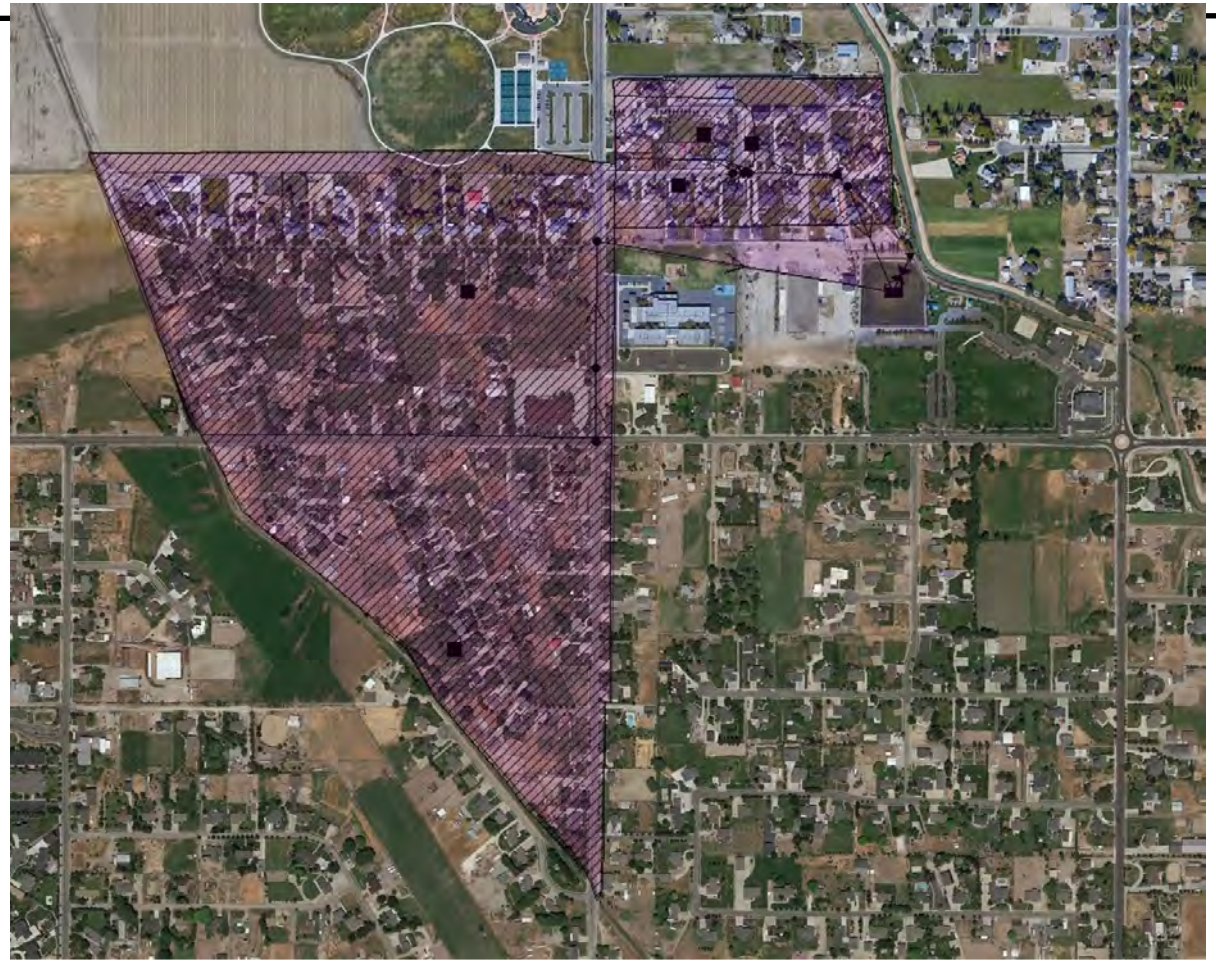
Deliverables

- Four EPA SWMM models
- GIS model - Existing and Proposed Conditions

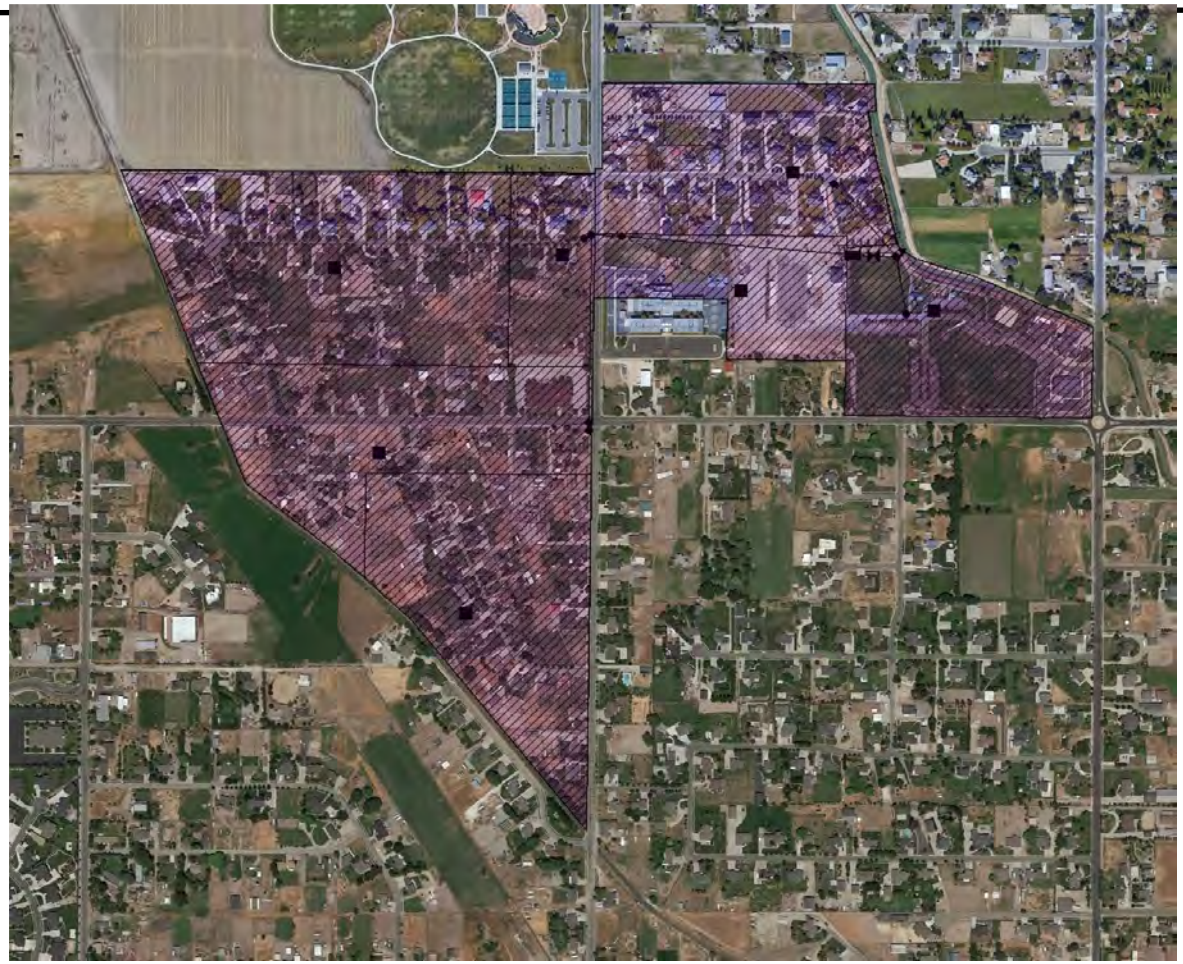
Tasks

- Fill out DIP sheets for all storm drain infrastructure in Bluffdale City Park sub-basin
- Take GPS points at all points of relevance to project
- Update existing GIS Model with accurate measurements and coordinates
- Update existing EPA SWMM models with accurate Hydrologic and Hydraulic parameters
- Simulate 10 year and 100 year storm recurrence events and identify flooding and other issues
- Simulate 10 year and 100 year events with new proposed conditions

Design and Analysis



Previous SWMM Model of Bluffdale City Park Watershed

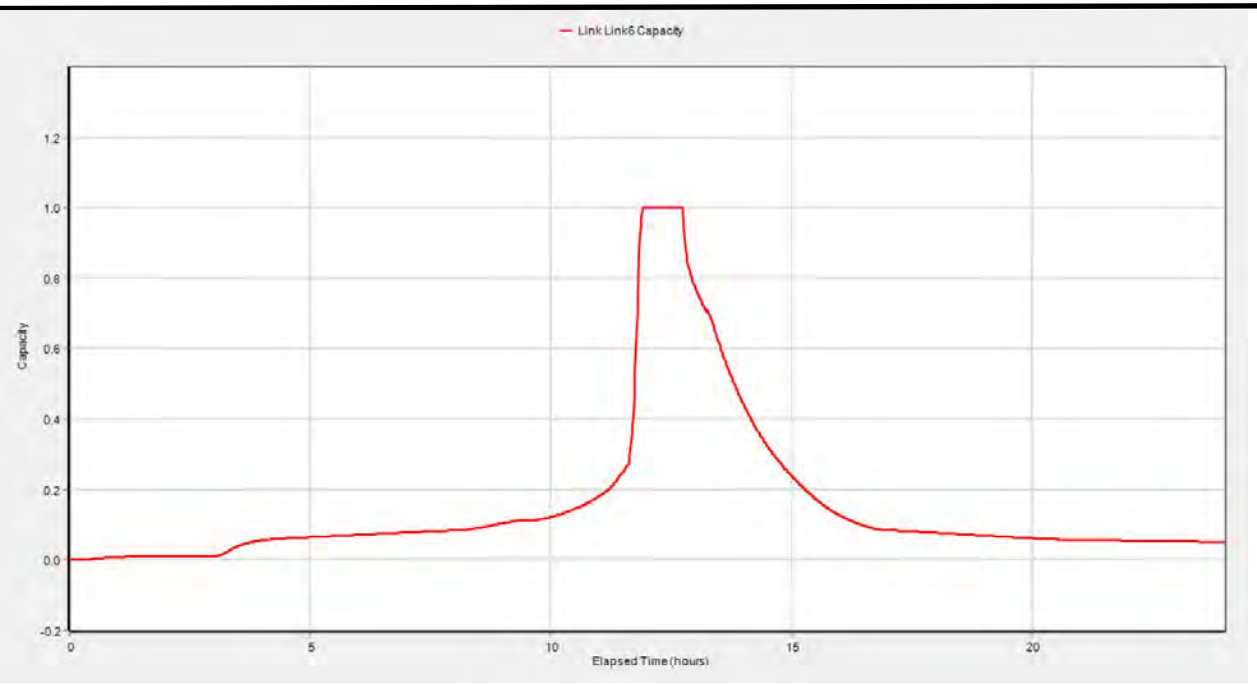


Updated SWMM Model of Bluffdale City Park Watershed

Discussion of Results

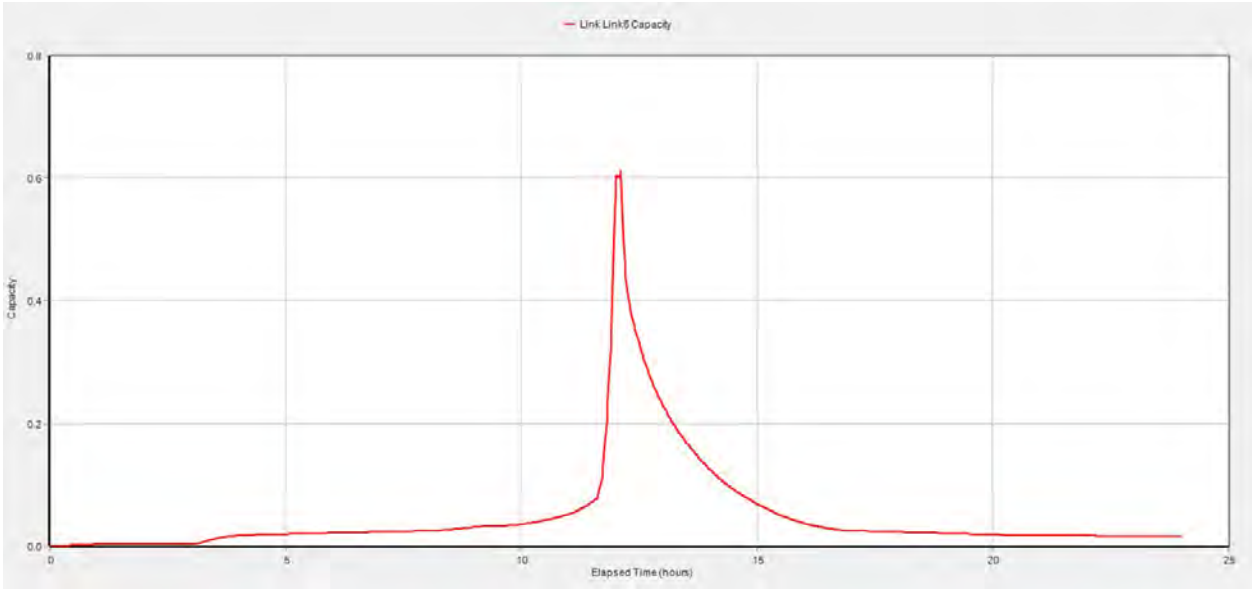
- The watershed basins were delineated
- New nodes were chosen to connect a more robust network of links
- Coordinate points were updated
- Subcatchment, storage pond, and conduit parameters were updated to reflect observed conditions and new assumptions
- The stormwater system was designed to meet required capacity
  - kept water velocity below 15 feet/second globally and under 10 feet/second wherever reasonable.

Discussion of Results

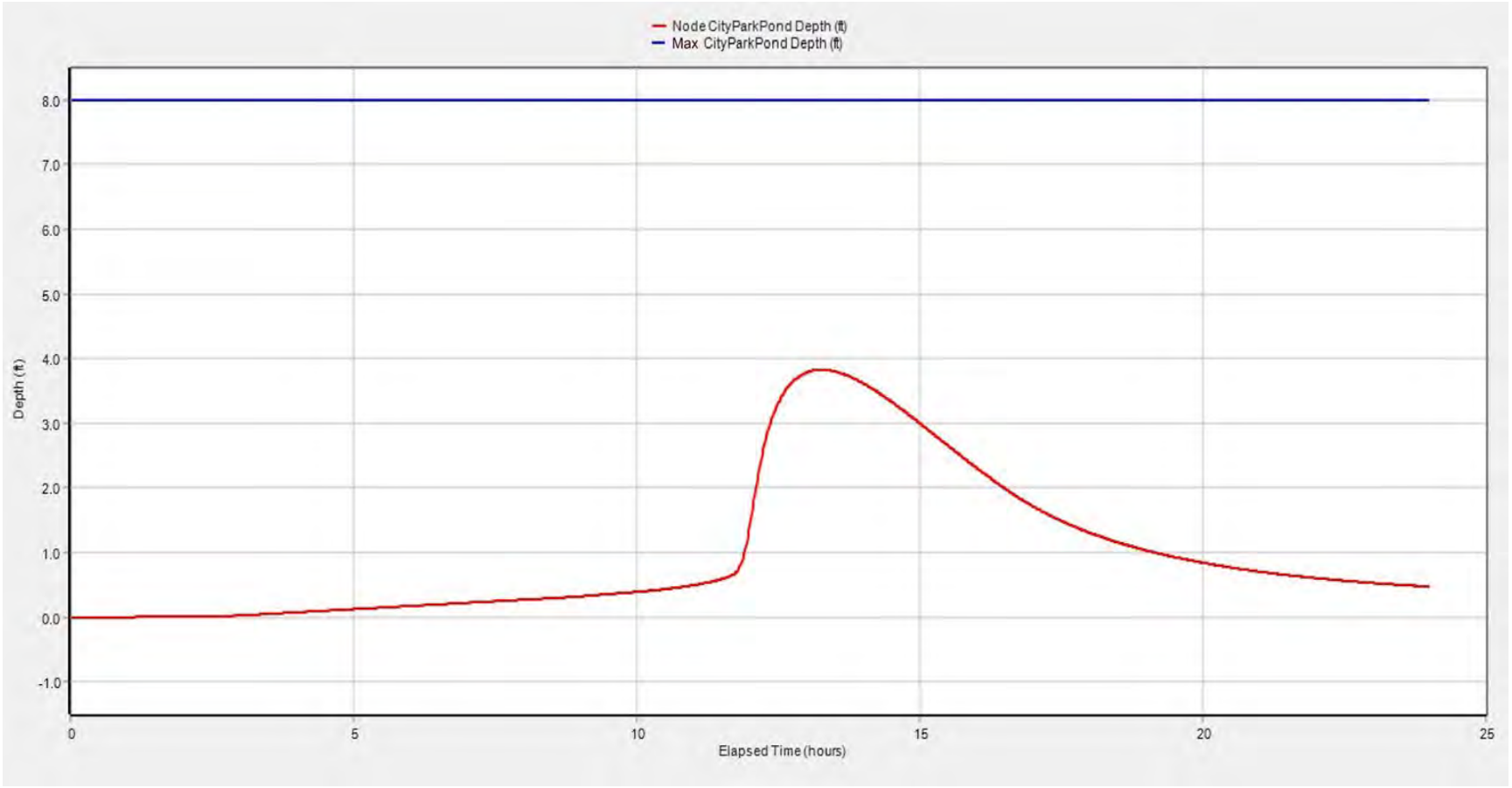


Above: Existing Conditions flow reaches Maximum Capacity, Causes Flooding

Below: Proposed Conditions flow does not reach Maximum Capacity, No Flooding



Discussion of Results



Bluffdale City Park Pond does not reach Maximum Capacity during 100-year storm event, No Flooding

Conclusions

- The junction boxes in general could benefit from clearing out.
- Several pipes are recommended to be upsized to meet design requirements for a 10-year storm.
- The Storage pond is adequate for a 100-year storm.
- Several adjustments to flow line inverts are recommended to keep velocities at an acceptable level.

Recommendations

From SWMM Model

SWMM Link Number	Upstream GIS Node #	Downstream GIS Node #	New Diameter (Increase)	Upstream Invert	Downstream Invert	Replacement Length (LF)
0	622	Outfall	N/A	No Change	Decrease 3”	40
1	613	622	36” (+15”)	No Change	No Change	311
2	801	Pond Inlet	36” (+18”)	No Change	No Change	1200
3	638	622	30” (+15”)	No Change	No Change	508
4	104	801	48” (+18”)	No Change	Decrease 55”	158
5	101	104	36” (+21”)	No Change	Decrease 18”	37
6	713	104	36” (+18”)	No Change	Decrease 18”	1012
7	113	713	36” (+18”)	No Change	No Change	42

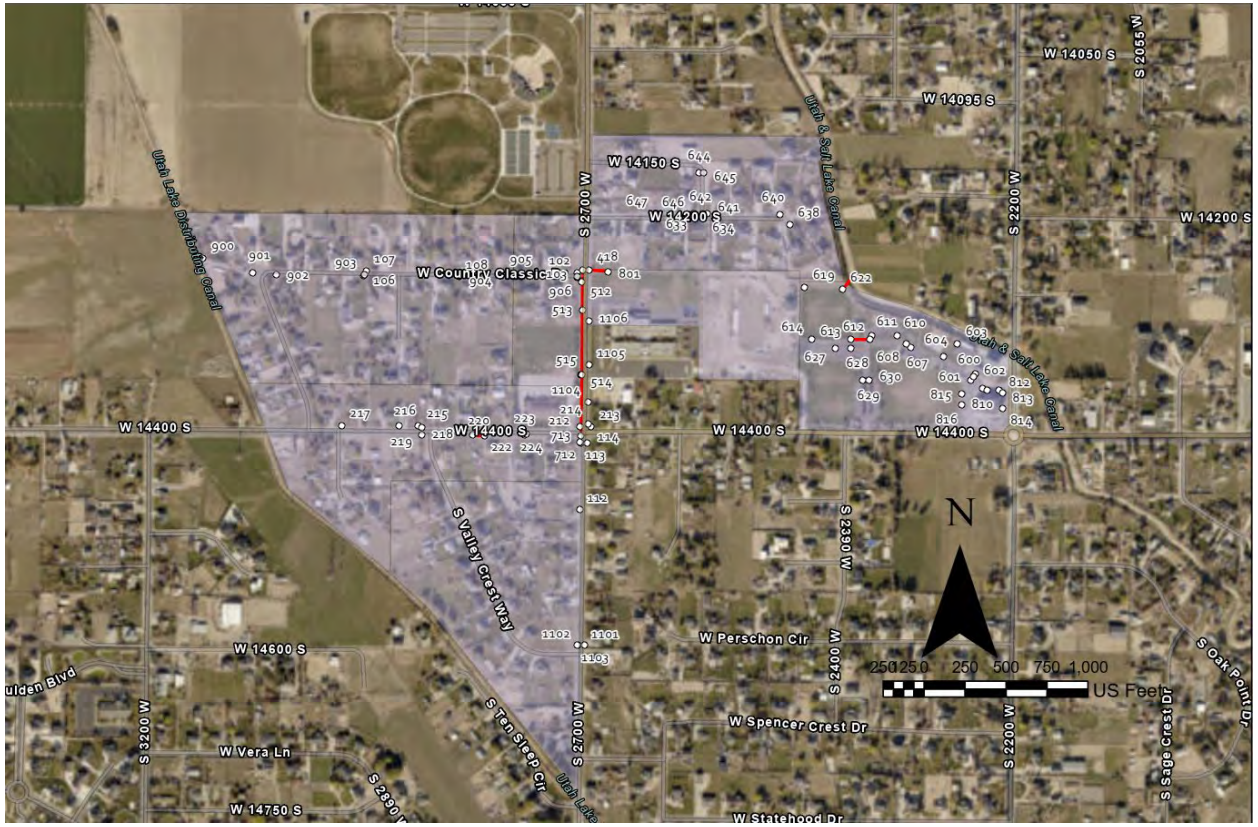
SWMM Link Number	Physical Description
0	From Pond Outlet (Node 622) to Outfall of Salt Lake Canal
1	From parking lot of Bluffdale City Park (Node 613) to Pond Outlet (Node 622)
2	From entrance to Bluffdale Elementary (Node 801) to Pond Inlet (Node 619)
3	From approx. 2599 West St. (Node 638) to Pond Inlet (Node 619)
4	From corner of Country Classic and 2700 W (Node 104) to entrance to Bluffdale Elementary (Node 801)
5	From one corner of Country Classic and 2700 W (Node 101) to the other Node (104)
6	From corner of 14400 S and 2700 W (Node 713) to corner of Country Classic and 2700 W (Node 104)
7	From one corner of 14400 S and 2700 W (Node 113) to the other (Node 713)

Recommendations Cont'd

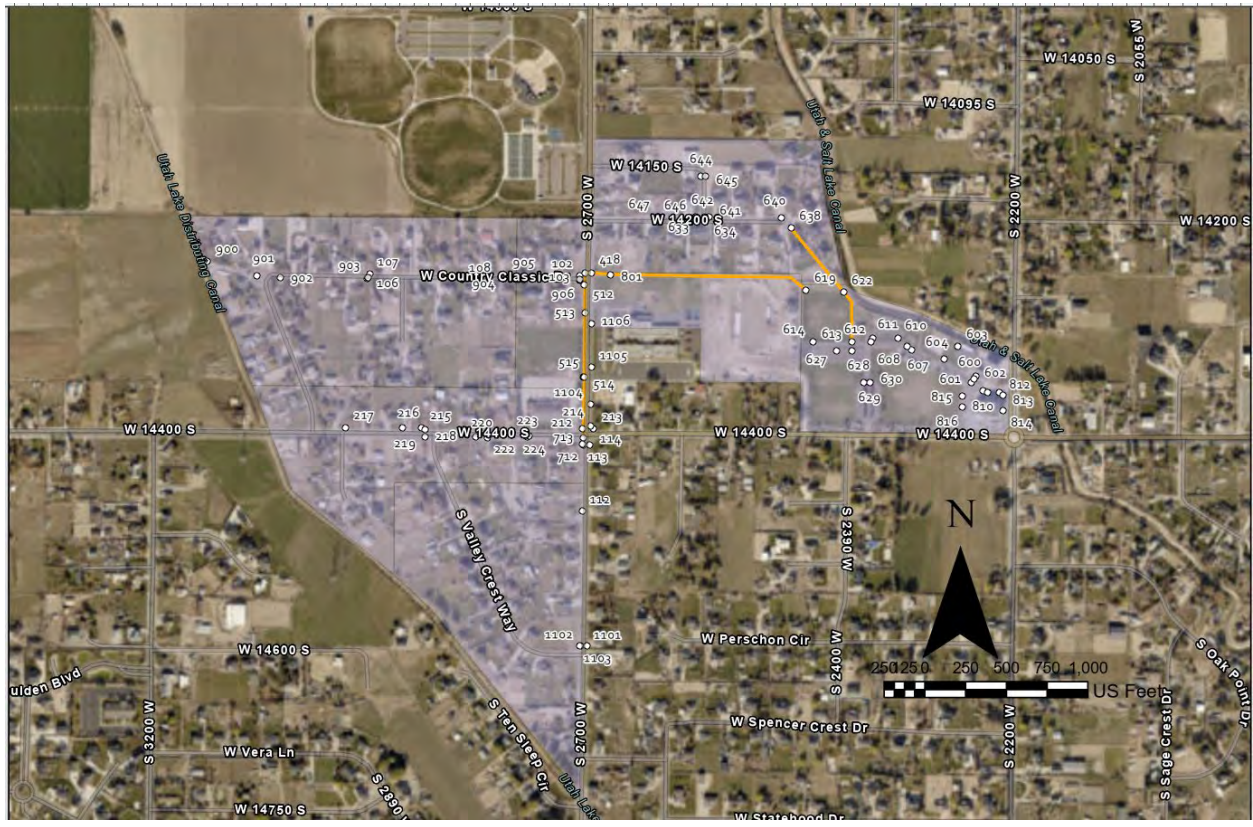
Adverse Slope Recommendations

Upstream Node	Downstream Node	Upstream Elevation	Downstream Elevation	Height Difference	Recommended Action
220	222	4533.479	4535.264	-1.785	Increase Upstream Invert 3'
1101	1102	4543.759	4543.919	-0.16	Small Adverse Slope, Clean Pipe
1103	1102	4543.755	4543.919	-0.164	Small Adverse Slope, Clean Pipe
906	102	4507.05	4507.573	-0.523	Increase Upstream Invert 1'
633	647	4497.668	4498.083	-0.415	Increase Upstream Invert 1'
644	645	4494.049	4494.054	-0.005	Small Adverse Slope, Clean Pipe
812	811	4487.043	4487.113	-0.07	Small Adverse Slope, Clean Pipe
601	602	4485.91	4486.031	-0.121	Small Adverse Slope, Clean Pipe
612	613	4484.088	4484.38	-0.292	Increase Upstream Invert 0.5'
627	628	4484.471	4484.569	-0.098	Small Adverse Slope, Clean Pipe

Recommendations Cont'd



We Recommend Replacing red pipes with decrease in slope



We recommend replacing orange pipes with increased diameter

The End

Any Questions?