COLD SPRING RANCH AREA PLAN
PRESSURE IRRIGATION

Introduction

Lehi City conducted a water model analysis of the region which included the Cold Spring Ranch properties. This document represents a water system analysis specific to the Cold Spring Ranch Area plan. For this analysis the following assumptions have been made:

1. Water source from connection to existing Lehi City pressure irrigation system on west side of the Jordan River
2. Future Pond elevation of 4740

Design Criteria

Minimum Pipe Size	8"
Pipe Roughness Coefficient	0.85
Average Flow	3.5 gallons per minute per acre
Peak Hourly Flow	7.0 gallons per minute per acre (Peaking Factor = 2)
Storage	5,040 gallons per acre
Source	3.5 gallons per minute per acre
Fire Flow	1,500 gallons per minute (2 hour fire)
Minimum Pressure	50 psi at peak flow
	20 psi at peak flow with fire flow

Summary of Results

Peak Hourly Flow	785.6 gallons per minute
Source Required	392.8 gallons per minute

Storage Required
Future Pond 1,347,646 gallons + 180,000 gallons fire storage = 1,527,646 gallons (7.96 ac-ft)

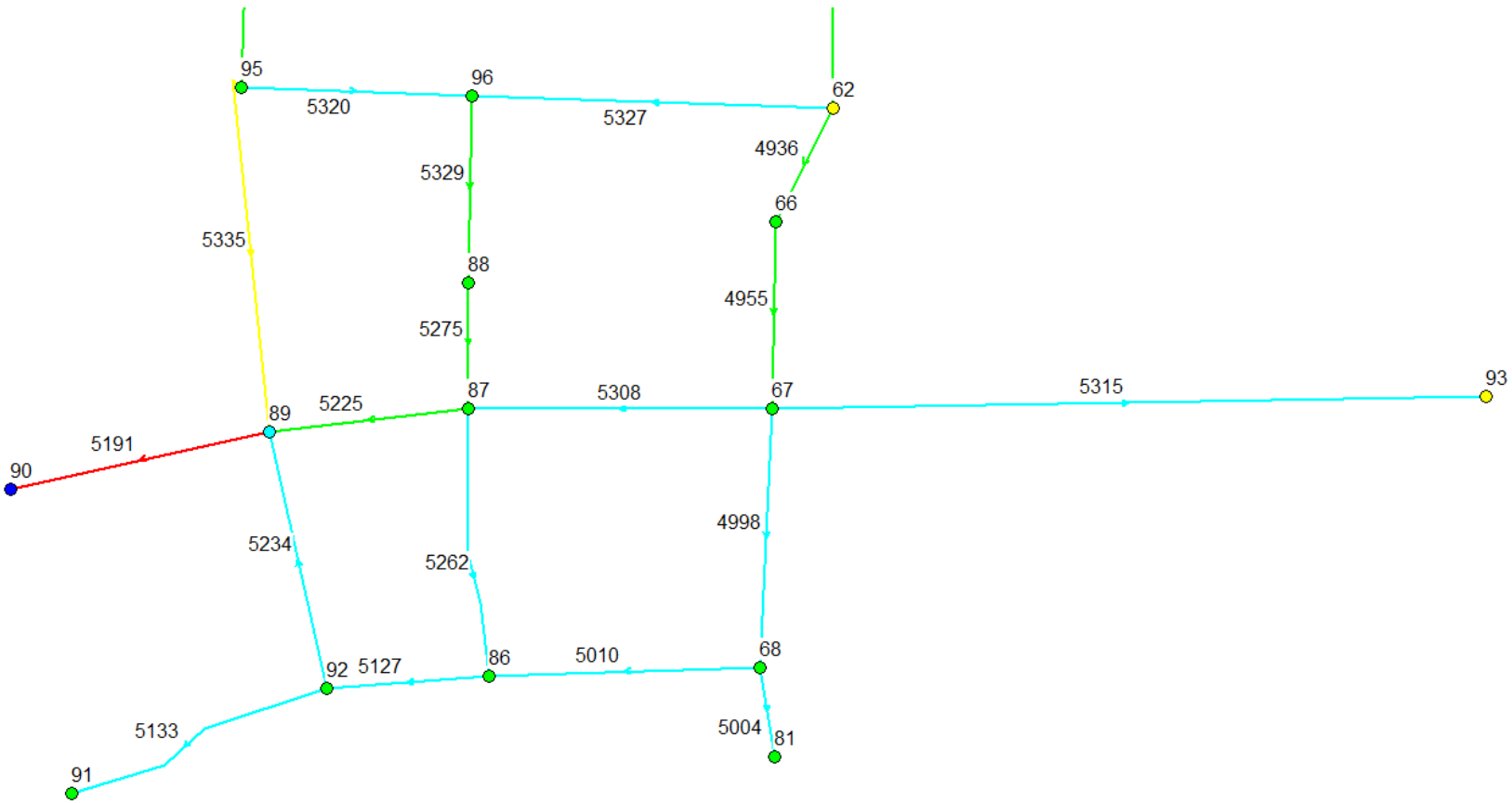
Case 1: Peak Hourly
Minimum Pressure 65.8 psi @ Junction 90
Case 2: Peak Hourly + Fire
Minimum Pressure 20.8 psi @Junction 90 (1,500 GPM)

Cold Spring Ranch Area Plan
Pressure Irrigation

		Approx. Acres	Irr. Area (acres)	Average Flow (3.5 gpm/acre)	Peak Hourly Flow (Peak Factor 2.0)	Storage Required (5,040 gal/acre)	Storage Required
Area	Land Use	Acres	Acres	gpm	gpm	gallons	ac-ft
1	Commercial	20.0	2.0	7.0	14.0	100,649	0.31
2	Commercial	23.1	2.3	8.1	16.2	116,525	0.36
3	Commercial	8.4	0.8	2.9	5.9	42,336	0.13
4	Very High Density Residential	12.8	2.6	8.9	17.9	64,310	0.20
5	Very High Density Residential	4.7	0.9	3.3	6.6	23,738	0.07
6	High Density Residential	12.2	3.7	12.8	25.6	61,538	0.19
7	High Density Residential	8.7	2.6	9.1	18.2	43,646	0.13
8	High Density Residential	4.6	1.4	4.9	9.7	23,386	0.07
9	High Density Residential	10.7	3.2	11.2	22.5	53,928	0.17
10	High Density Residential	8.2	2.5	8.6	17.2	41,328	0.13
11	Medium Density Residential	5.1	2.0	7.1	14.1	25,452	0.08
12	Medium Density Residential	20.4	8.2	28.6	57.2	102,967	0.32
13	Medium Density Residential	7.5	3.0	10.5	21.0	37,750	0.12
14	Medium Density Residential	16.5	6.6	23.1	46.2	83,210	0.26
15	Medium Density Residential	21.5	8.6	30.1	60.2	108,310	0.33
16	Low Density Residential	22.9	13.7	48.0	96.0	115,164	0.35
17	Open Space	60.2	48.2	168.6	337.1	303,408	0.93
Totals		267.4	112.2	392.8	785.6	1,347,646	4.14

Irrigation factors for:	
Commercial	0.1
VHD	0.2
HD	0.3
MD	0.4
LD	0.6
Open Space	0.8

Cold Spring Ranch Area Plan (Hydraulic Model Nodes and Pipes Labeled)



Cold Spring Ranch Area Plan
Pressure Irrigation Water Model
Static Pressure No Demands

Node ID	Static Pressure (psi)
95	84.0
96	88.1
62	97.3
66	96.3
88	88.5
90	69.2
89	74.3
87	88.6
67	96.0
93	106.6
68	97.3
81	93.5
86	81.2
92	78.7
91	76.6

Cold Spring Ranch Area Plan
Pressure Irrigation Water Model
Peak Hour with 1,500 Fire Flow

Node Summary

	Elevation	Demand	Head	Pressure
Node ID	ft	GPM	ft	psi
95	4551.2	0.0	4694.7	62.2
96	4541.7	0.0	4692.3	65.3
62	4520.6	0.0	4695.4	75.7
66	4522.9	0.0	4689.7	72.3
88	4540.7	0.0	4685.5	62.7
90	4585.3	1520.0	4633.2	20.8
89	4573.5	24.6	4677.3	45.0
87	4540.6	60.8	4681.0	60.8
67	4523.4	63.3	4681.4	68.5
93	4499.0	306.4	4676.2	76.8
68	4520.4	137.0	4679.7	69.0
81	4529.1	75.0	4679.6	65.2
86	4557.6	57.5	4679.5	52.8
92	4563.4	28.4	4678.5	49.9
91	4568.2	18.1	4678.5	47.8

Link Summary

	Diameter	Roughness	Flow	Velocity	Status
Link ID	in		gpm	fps	
5320	8.0	0.85	371	2.4	Open
5327	8.0	0.85	-332	2.1	Open
4936	8.0	0.85	781	5.0	Open
4955	8.0	0.85	781	5.0	Open
5329	8.0	0.85	703	4.5	Open
5275	8.0	0.85	-703	4.5	Open
5335	8.0	0.85	-807	5.2	Open
5191	8.0	0.85	1520	9.7	Open
5225	8.0	0.85	497	3.2	Open
5308	8.0	0.85	121	0.8	Open
5315	8.0	0.85	306	2.0	Open
4998	8.0	0.85	291	1.9	Open
5262	8.0	0.85	-265	1.7	Open
5234	8.0	0.85	240	1.5	Open
5133	8.0	0.85	18	0.1	Open
5127	8.0	0.85	287	1.8	Open
5010	8.0	0.85	79	0.5	Open
5004	8.0	0.85	75	0.5	Open

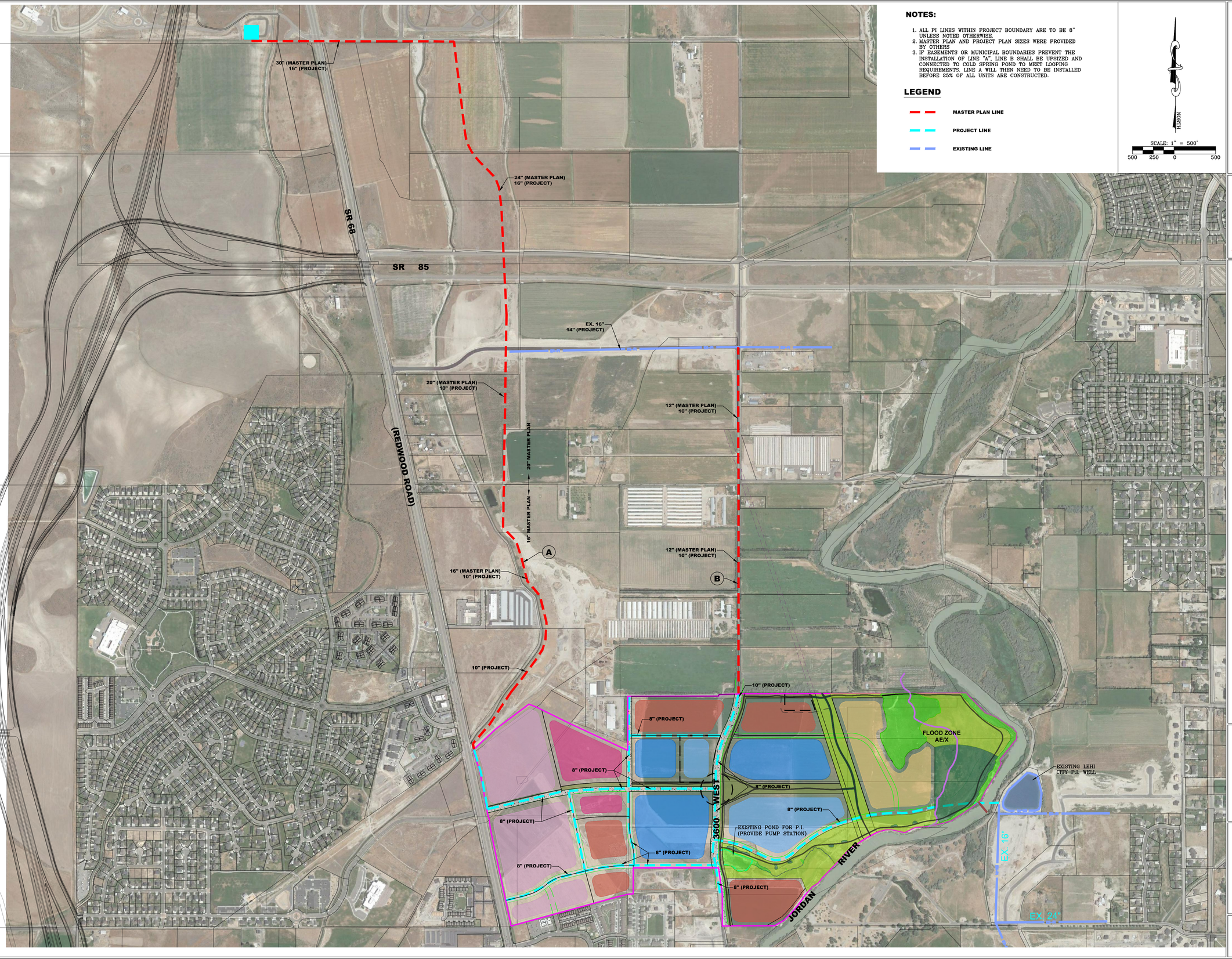
Cold Spring Ranch Area Plan
Pressure Irrigation Water Model
Peak Hourly No Fire Flow

Node Summary

	Elevation	Demand	Head	Pressure
Node ID	ft	GPM	ft	psi
95	4551.2	0.0	4738.9	81.3
96	4541.7	0.0	4738.4	85.3
62	4520.6	0.0	4738.7	94.5
66	4522.9	0.0	4737.8	93.1
88	4540.7	0.0	4737.6	85.3
90	4585.3	11.2	4737.2	65.8
89	4573.5	24.6	4737.2	70.9
87	4540.6	60.8	4737.0	85.1
67	4523.4	63.3	4736.5	92.4
93	4499.0	306.4	4731.3	100.7
68	4520.4	137.0	4736.3	93.6
81	4529.1	75.0	4736.3	89.8
86	4557.6	57.5	4736.7	77.6
92	4563.4	28.4	4736.8	75.1
91	4568.2	18.1	4736.8	73.0

Link Summary

	Diameter	Roughness	Flow	Velocity	Status
Link ID	in		gpm	fps	
5320	8.0	0.85	149	1.0	Open
5327	8.0	0.85	-89	0.6	Open
4936	8.0	0.85	301	1.9	Open
4955	8.0	0.85	301	1.9	Open
5329	8.0	0.85	238	1.5	Open
5275	8.0	0.85	-238	1.5	Open
5335	8.0	0.85	-243	1.6	Open
5191	8.0	0.85	11	0.1	Open
5225	8.0	0.85	-84	0.5	Open
5308	8.0	0.85	-148	0.9	Open
5315	8.0	0.85	306	2.0	Open
4998	8.0	0.85	79	0.5	Open
5262	8.0	0.85	-114	0.7	Open
5234	8.0	0.85	-123	0.8	Open
5133	8.0	0.85	18	0.1	Open
5127	8.0	0.85	-77	0.5	Open
5010	8.0	0.85	-133	0.9	Open
5004	8.0	0.85	75	0.5	Open



NOTES:

1. ALL PI LINES WITHIN PROJECT BOUNDARY ARE TO BE 8" UNLESS NOTED OTHERWISE.
2. MASTER PLAN AND PROJECT PLAN SIZES WERE PROVIDED BY OTHERS
3. IF EASEMENTS OR MUNICIPAL BOUNDARIES PREVENT THE INSTALLATION OF LINE "A", LINE B SHALL BE UPSIZED AND CONNECTED TO COLD SPRING POND TO MEET LOOPING REQUIREMENTS. LINE A WILL THEN NEED TO BE INSTALLED BEFORE 25% OF ALL UNITS ARE CONSTRUCTED.

LEGEND

- MASTER PLAN LINE
- PROJECT LINE
- EXISTING LINE

NORTH

SCALE: 1" = 500'

500 250 0 500

LEI

- A Utah Corporation -

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NOT FOR CONSTRUCTION

COLD SPRING RANCH

LEHI, UTAH

PI MASTER PLAN

REVISIONS
1 -
2 -
3 -
4 -
5 -

LEI PROJECT #:	2015-0125
DRAWN BY:	BAP
CHECKED BY:	BTG
SCALE:	1" = 500'
DATE:	1/17/2018

SHEET

PI-9

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