

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

RECEIVED
OCT 02 2017
DEPT OF WATER RESOURCES

A Beneficial Use Field Report is prepared by a water right examiner as the result of an examination to clearly confirm and establish the extent of the beneficial use of water established in connection with a permit during the development period authorized by the permit and any extensions of time previously approved.

A. GENERAL INFORMATIONPermit No. 63-336551. Owner City of Boise, Department of Parks and RecreationPhone No. 208-608-7600Current address 1104 Royal Boulevard, Boise, ID 837062. Examiner's name Terry Scanlan, P.E., P.G.EXAM DATE 6/16/20173. Accompanied by Mike WoodwardEmail mwoodward@cityofboise.orgAddress 1104 Royal Boulevard, Boise, ID 83706Relationship to permit holder Horticulture Manager, BPRDPhone No. 208-608-71894. Source Ground Water

tributary to _____

B. OVERLAP REVIEW1. Other water rights with the same place of use Boise-Kuna Irrigation District surface water2. Other water rights with the same source and point of diversion None**C. DIVERSION AND DELIVERY SYSTEM**

1. Point(s) of Diversion:

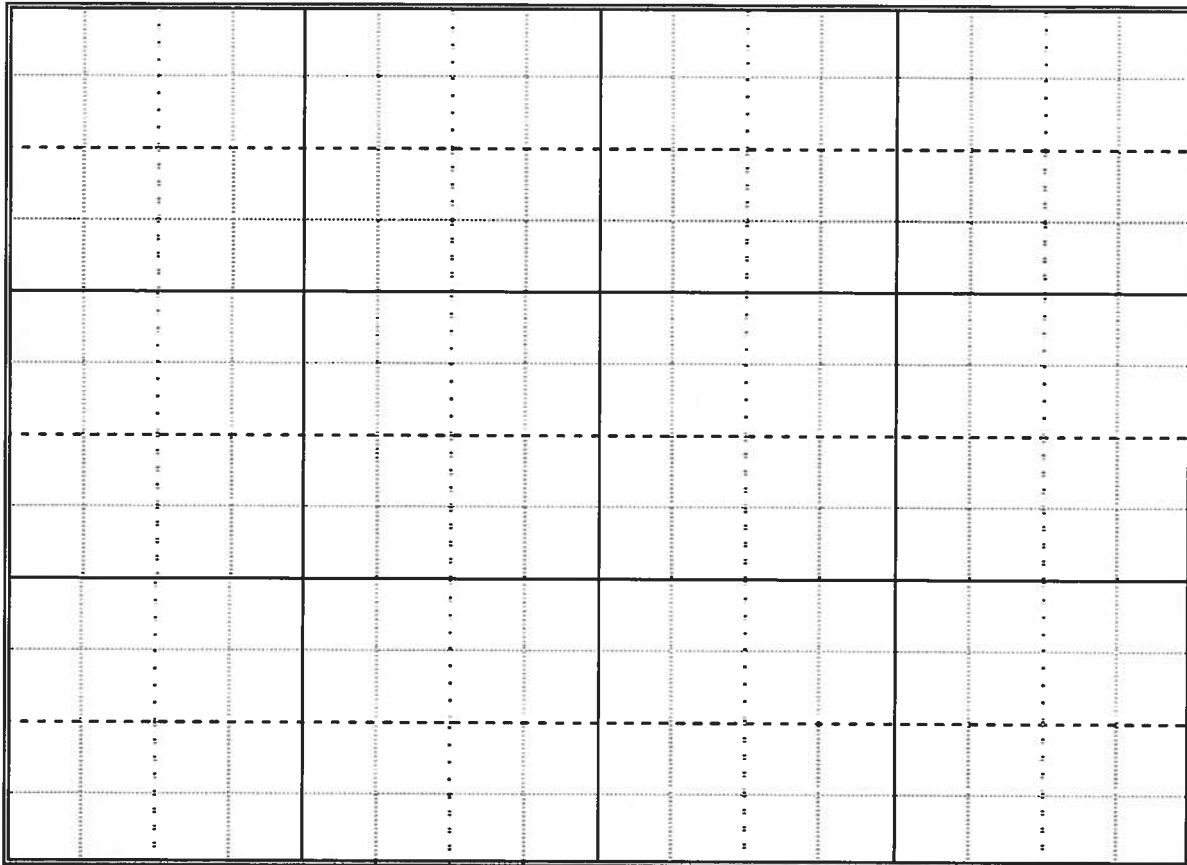
Ident. No.	Gov't Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determination/Remarks
			SE	SE	23	3N	1E	Ada	Exam, Aerial Photo

2. Place(s) of Use:

Method of determination Exam, aerial photo

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
3N	1E	23																X	

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☒ see attached.



Scale: 1" = _____

- ☒ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (required)
☒ Aerial photo attached (required for irrigation of 10+ acres)
☒ Photo of diversion and system attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
Well Pump		15	Submersible	Goulds	3 inch
				6CNLC	

*Code to correspond with no. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
Flow Meter	Mag	Badger	M2000	1512-117/484	4-inch	New in 2016

2. Measurements: _____

223 to 245 gpm (0.50 to 0.55 cfs) steady after operating for 15 minutes

E. NARRATIVE/REMARKS/COMMENTS

An 8-inch diameter well, is equipped with a 15 hp submersible pump and provides ground water to a soil-lined pond for Molenaar Park. Surface water from Boise-Kuna Irrigation District is also diverted to the pond as the primary irrigation source when available. The purpose of the well is to supplement Boise-Kuna water when necessary and to keep the pond full during the non-irrigation season for municipal storage, including recreation, aesthetic and wildlife uses. Water from the well discharges directly into pond suction pipe to either flow to the pump house to be pumped into the pressurized irrigation system or flow to the pond for water level maintenance (see the pump house plan included in Attachment B). The well was completed with 8-inch diameter steel casing from +2 to 147 feet, and 8-inch diameter, 0.025 slot screen from 147 to 167 feet. The well is 183 feet deep and backfilled to 167 feet. The pressure irrigation pump system has two 15-hp pumps and a 3-hp jockey pump with a total rated capacity of 490 gpm at 80 psi.

The design minimum capacity for the 15 hp well pump is 200 gpm at 135 feet TDH. The flowmeter measured 234 gpm (0.52 cfs) average at the time of the field exam, which is less than the 1.0 cfs allowed under the permit.

Development found at the time of the exam includes 16 acres of landscape area and 1.0 acre pond surface area with a maximum depth of 17 feet. Storage volume is approximately 8 acre feet. ET Idaho information included in Attachment C indicates the pond will have 2.3 ac-ft loss to evaporation per year. Seepage loss, based on the design maximum rate of 1/2 inch per day, is 15.2 acre feet over the 1.0 acre pond area. The permit allows 114 afa for storage (including evaporation and seepage) with multiple fills.

Exam Attachments

Attachment A: Field Exam Map

Attachment B: System Components and Diagrams

Attachment C: Flow Rate and Volume Calculations

Attachment D: Exam Photos

Attachment E: Proof of Beneficial Use

Has the permit holder met all conditions of permit approval, including any mitigation requirements and/or measuring device installation requirements? ☐ Yes ☒ No If no, what must be done to meet the permit requirements?

Water-bearing zone of the well is 147 to 167 feet, rather than the specified 100 to 150 feet. Recommend modifying (or eliminating) water-bearing zone requirements.

F. FLOW CALCULATIONS☒ Additional computation sheets attached

Measured Method:

Specific capacity from well driller's report = 300 gpm / 70 feet = 4.3 gpm/ft

TDH = static water level (46 feet) + drawdown (234 gpm/4.3 gpm/ft=54')+15' misc friction loss = 115 feet

15 hp x 3960 x 75% eff / 115' = 387 gpm

measured flow rate = 234 gpm average = 0.52 cfs

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 16 \times 4.5 = 72.0$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 = 0.5 \times 246 \times 1.9835 = 244$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 72.0$$

2. Volume Calculations for Other Uses:

Irrigation (above) = 72 acre feet per year

Pond volume = 8.0 acre feet (1.0 acres x 8 feet average depth)

Evaporation loss = 2.3 acre feet per year

Seepage loss = 15.2 acre feet per year

Total Municipal Storage Use = 72+8.0+2.3+15.2 = 97.5 acre feet

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion Q (cfs)	Annual Volume V (afa)
	From	To		
Municipal Storage	1/1	12/31		97.5
Municipal from Storage	3/15	11/15		72
Diversion to Storage	1/1	12/31	0.52	
Totals:			0.52	97.5

2. Recommended Amendments

☐ Change P.D. as reflected on page 1☐ Add P.D. as reflected on page 1☐ None☐ Change P.U. as reflected on page 1☐ Add P.U. as reflected on page 1☒ Other**I. AUTHENTICATION**

Field Examiner's Signature

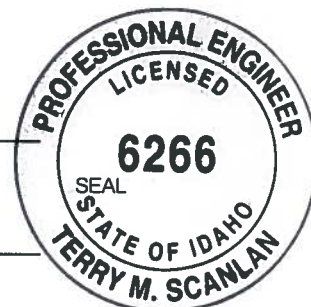
Terry M. Scanlan

Date

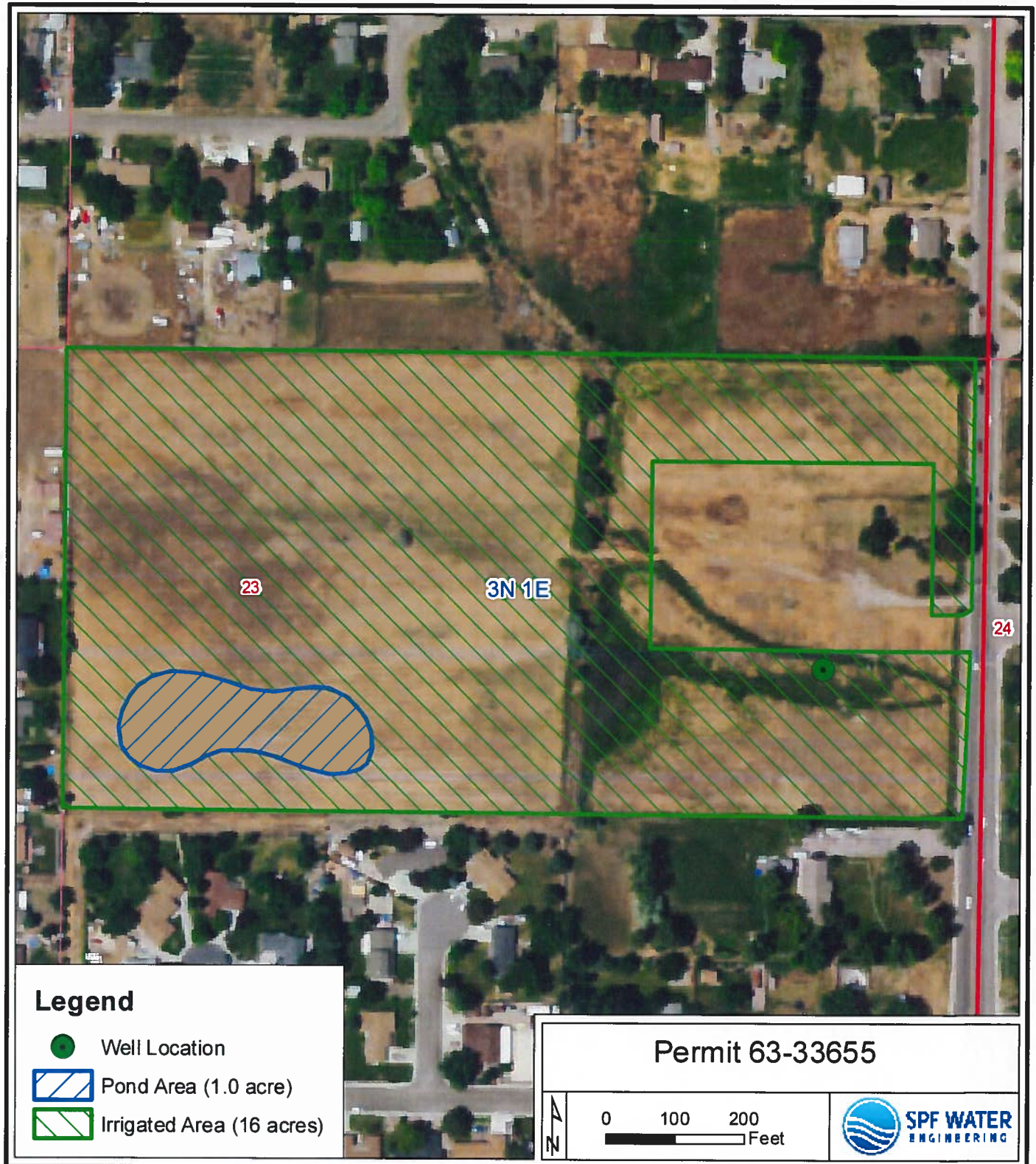
9/29/2017

Reviewer

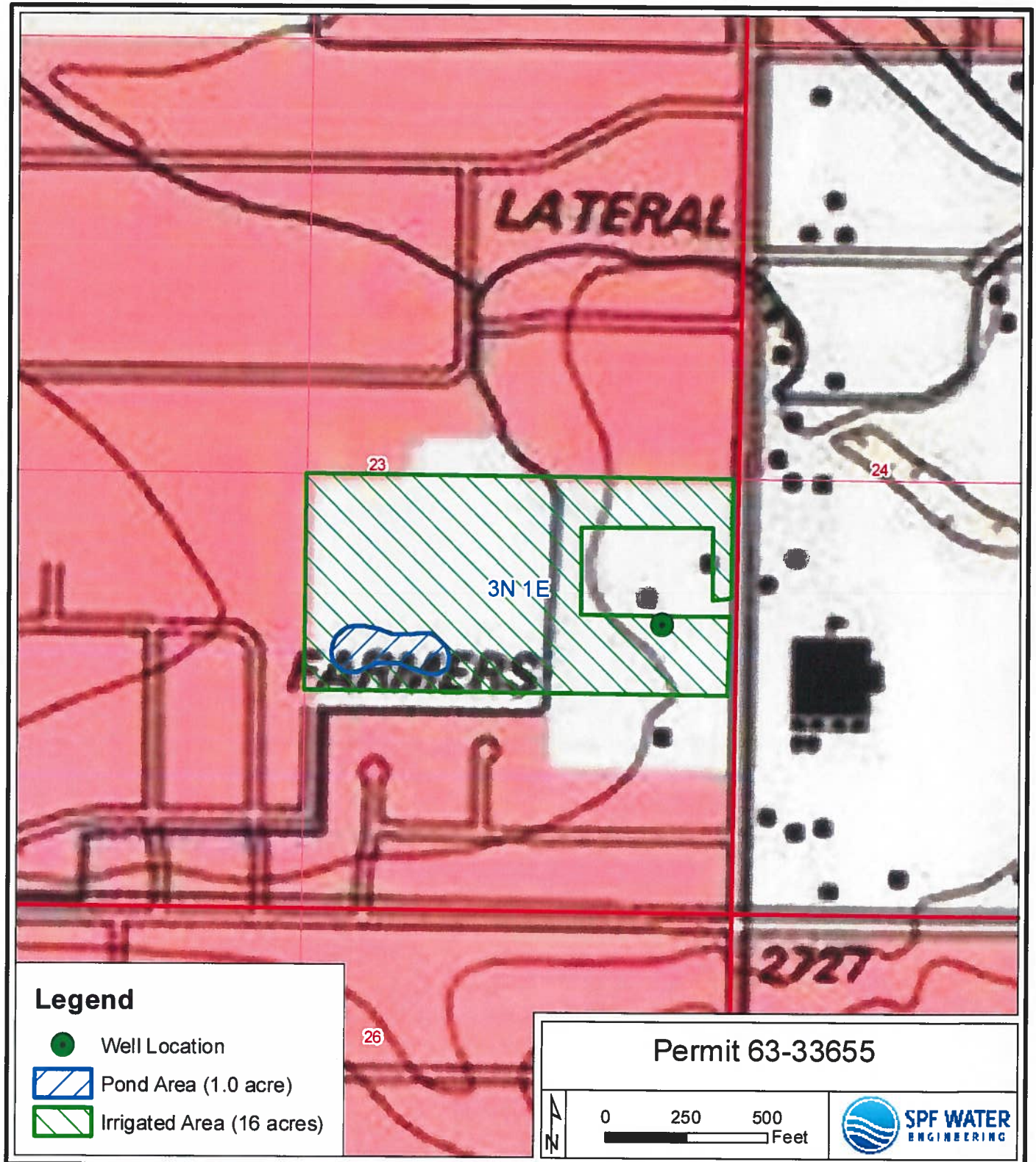
Date



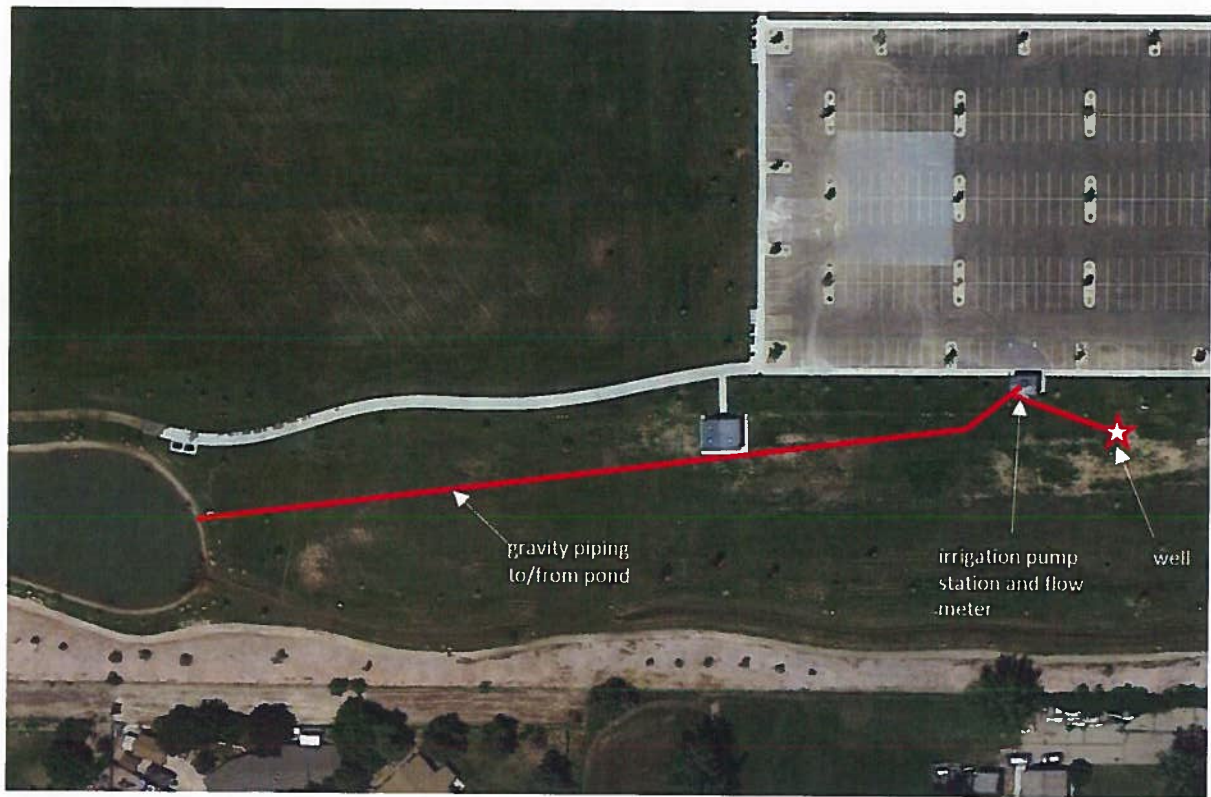
Molenaar Park



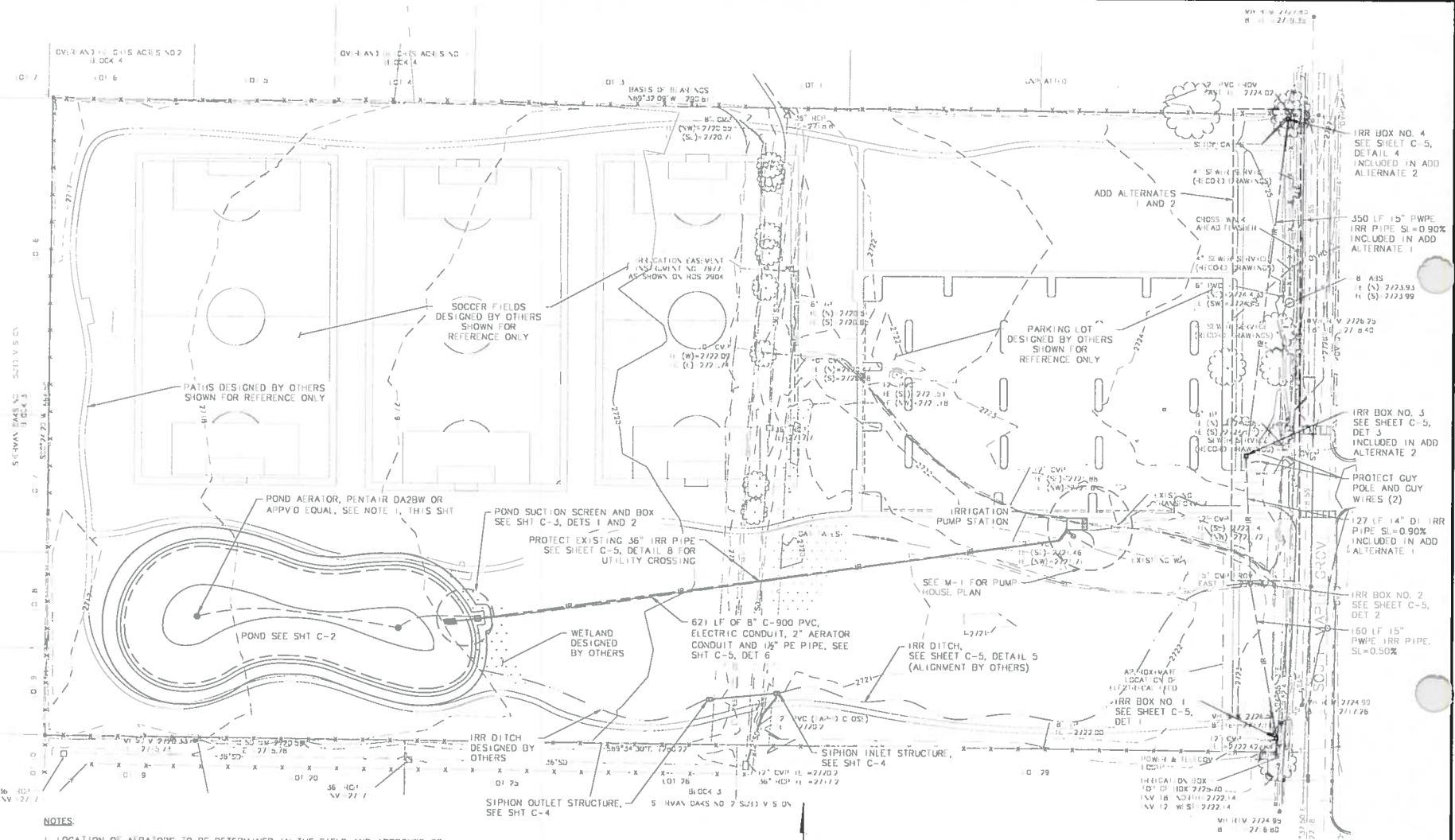
Molenaar Park



Attachment B
System Components and Diagrams



\\BOI-Proj\proj\14\1621-Sub\Drawings\Site Plan\14-1621-Sub-Cong-E-1-2-2720-5-4-57-PV-DWG-20-0a (LVS) (rev)



NOTES:

1. LOCATION OF AERATORS TO BE DETERMINED IN THE FIELD AND APPROVED OF BY OWNER. FOR EACH AERATOR INCLUDE ENOUGH TUBING TO REACH THE PUMP HOUSE (WEIGHTED TUBING IN THE POND, UN-WEIGHTED TUBING IN THE 2\"/>
2. HORIZONTAL CONTROL BY OWNER



PLAN
SCALE: 1"=50'

NO	DATE	BY	REVISION

NOTICE
0 1/2" = 1'
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NOTICE
DJK DESIGNED BAW DRAWN DC CHECKED



Murray, Smith & Associates, Inc.
Engineers/Planners
345 Riverside Court, Suite 230
Boise, Idaho 83706
PHONE: 208.947.9003
FAX: 208.947.9004



**MOLENAAR PARK
IRRIGATION
SUPPLY SYSTEM**

**SITE PLAN AND
EXISTING CONDITIONS**

C-1

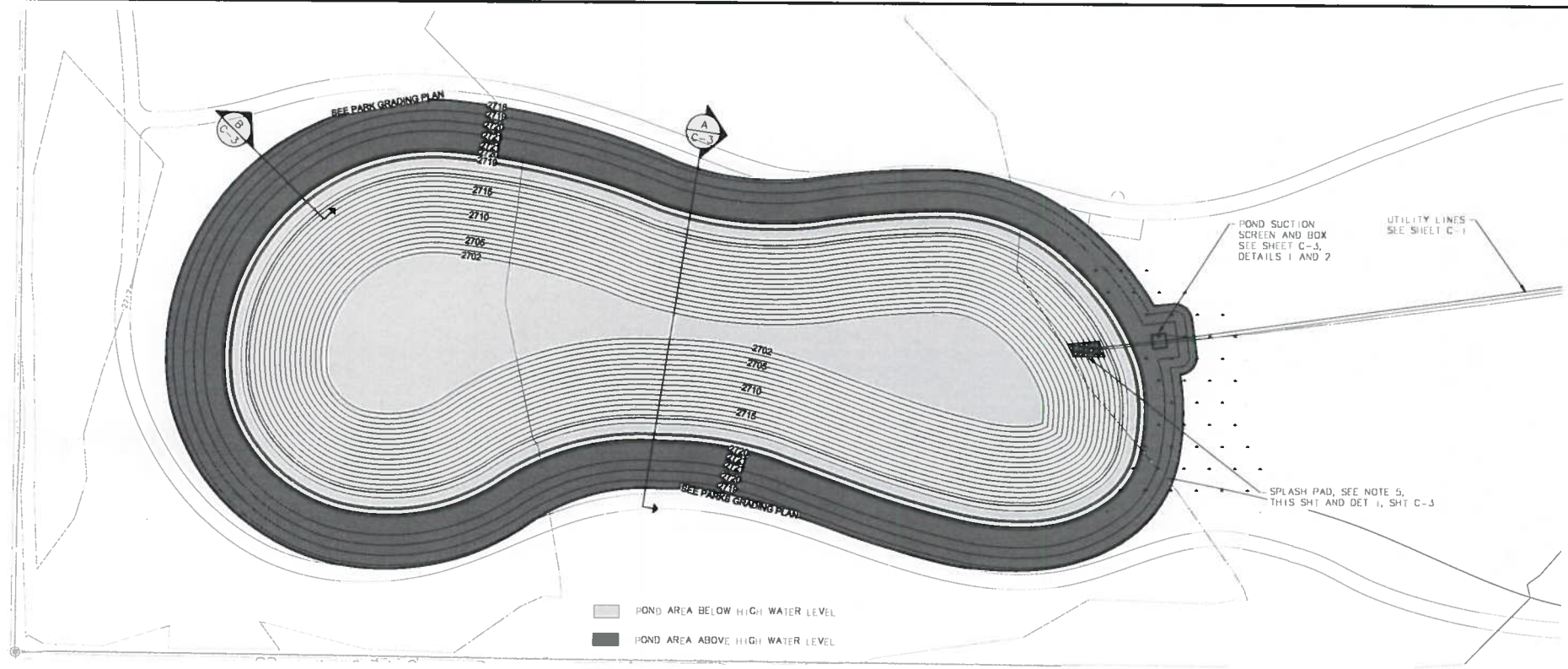
PROJECT NO. 14-1621-507 SCALE AS SHOWN DATE FEBRUARY 2015

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Attachment A

Field Exam Maps

\\B01-Projects\4-621-Molenaar Park\CAD\Drawings\4-621-Cong C-2-2-2\2013-4-57-PW-DJK 200k (US-1)en



NOTES:

1. SEE NOTE 2, SHEET C-1 FOR HORIZONTAL CONTROL
2. POND EMBANKMENTS TO BE CONSTRUCTED WITH NATIVE MATERIAL PER ISPWC SECTION 202.3.B. MATERIAL TO BE PLACED IN 6" LIFTS AND COMPACTION TESTING AT 4 LOCATIONS AROUND POND FOR EACH LIFT.
3. ALL EXCESS EXCAVATION FROM THE POND SHALL BE PLACED IN BERMS AND SHAPED WITH 5:1 SLOPES AT LOCATIONS AND PER THE DIRECTION OF THE BOISE PARKS AND RECREATION DEPARTMENT.
4. ALL EARTHWORK SHALL BE PERFORMED IN A MANNER CONSISTENT WITH THE MATERIALS TESTING, INC. GEOTECHNICAL REPORT DATED JUNE 6, 2012. ANY DISCREPANCIES BETWEEN THE REPORT AND THE ACTUAL SOIL CONDITIONS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
5. HAND PLACE 6" TO 12" IMPORTED ANGULAR RIP RAP.
6. HORIZONTAL CONTROL BY OWNER

NO.	DATE	BY	REVISION

NOTICE
0 1/4 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DJK
DESIGNED
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DC
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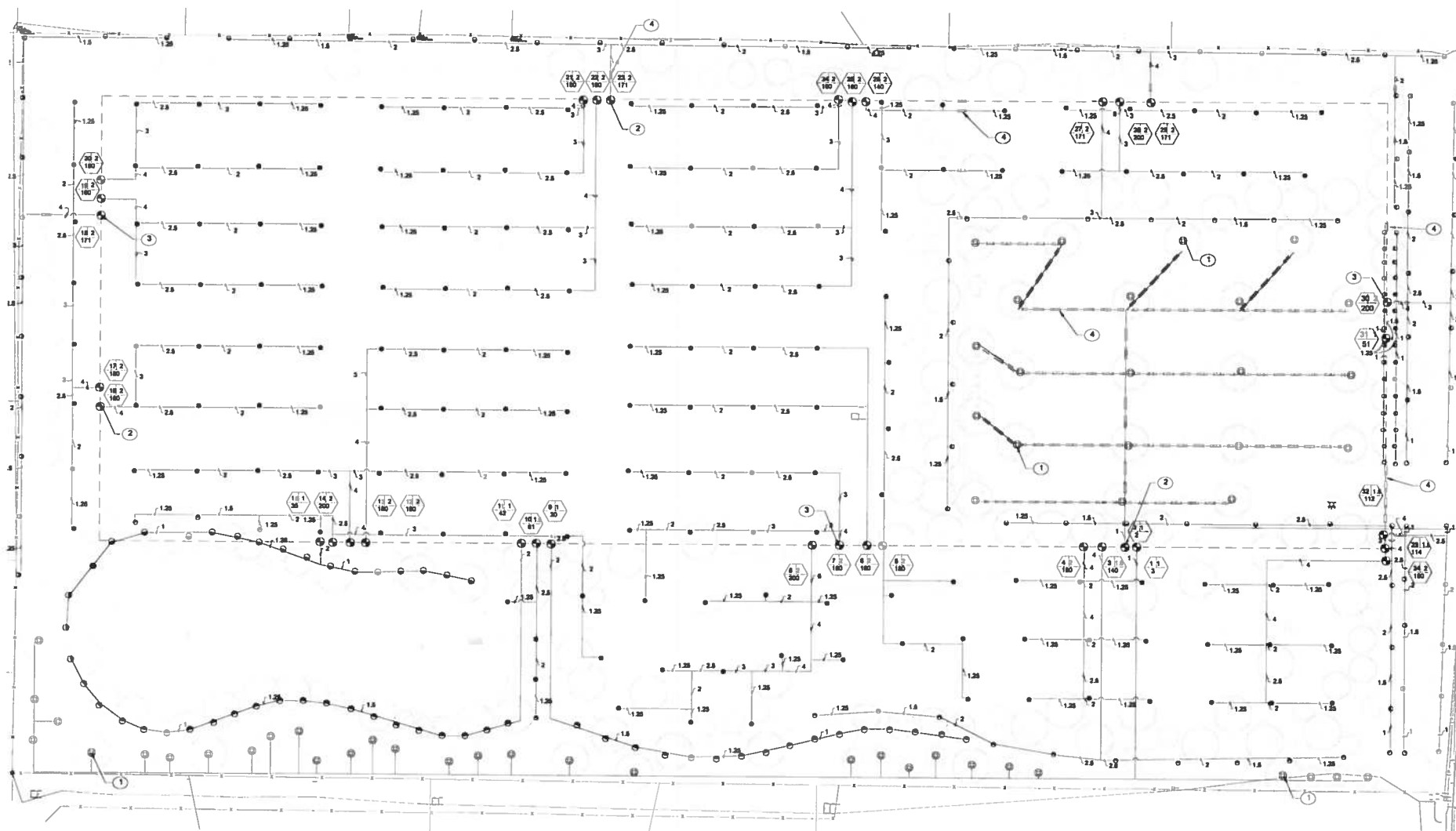
MSA Murray, Smith & Associates, Inc.
Engineers/Planners
345 Behrville Court, Suite 230
Boise, Idaho 83706
PHONE 208.947.8033
FAX 208.947.8034



**MOLENAAR PARK
IRRIGATION
SUPPLY SYSTEM**

**POND GRADING
AND HORIZONTAL CONTROL**
PROJECT NO. 14-621-507 SCALE: AS SHOWN DATE: FEBRUARY 2013

SHEET
C-2
5 of 14



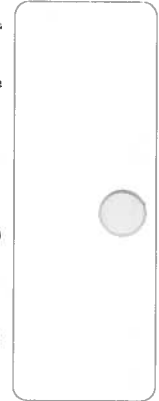
1 IRRIGATION PLAN
SCALE: 1"=40'-0"

2 SHEET NOTES

1. NETAFIM DRIP LINE OR APPROVED EQUAL. INSTALL PER MANUFACTURER'S RECOMMENDATION FOR INDIVIDUAL TREES. RE: 10-4, 8, 6
2. GROUP CONTROL VALVES FOR TRANSMITTER FOR 2-WIRE SYSTEM
3. INSTALL VALVES IN 'JUMBO' VALVE BOXES ALL LIDS TO BE 'NON-POTABLE' PURPLE. RE: 10-2
4. NEW SLEEVES SIZE TWICE AS LARGE AS IRRIGATION LINE.



Date	Review



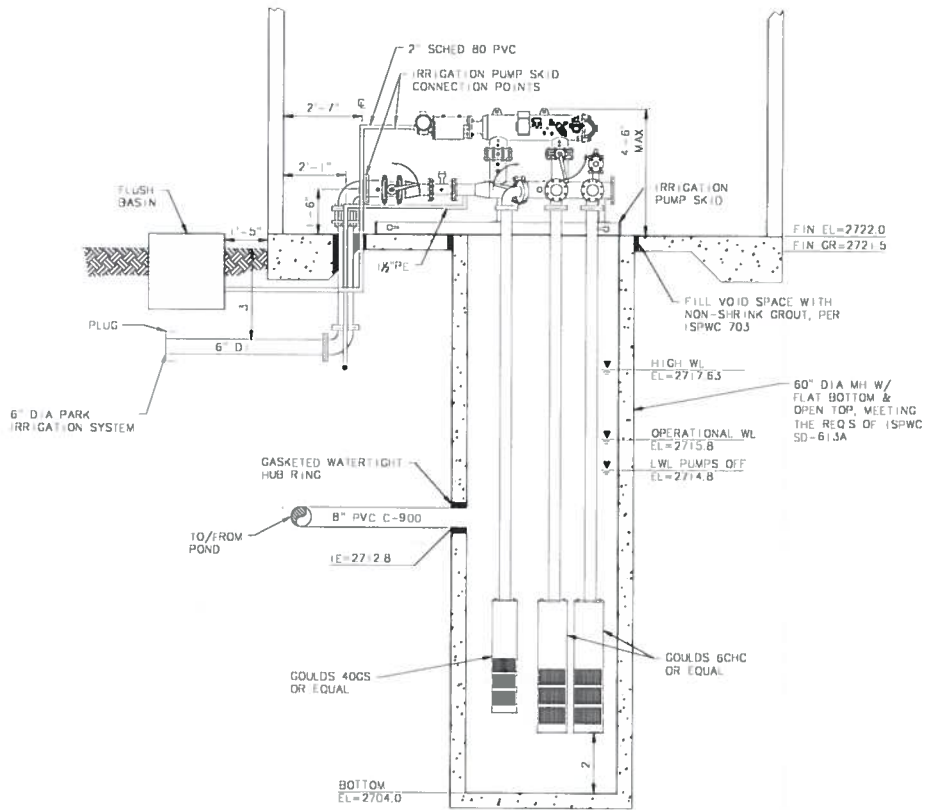
**MOLENAAR
COMMUNITY PARK
REEN-UP**

IRRIGATION
PLAN

Drawn By: [Signature]	Checked By: [Signature]
Drawn On: [Date]	Checked On: [Date]
Scale: 1"=40'-0"	Scale: 1"=40'-0"

9/12





PACKAGE PUMP STATION-SECTION (A)
SCALE: 1/2" = 1'-0" (M-1)

[illegible]

NOTICE

1/2

THIS BAR DOES
NOT MEASURE 1"
IN DRAWING IS
NOT TO SCALE

KRS
DESIGNED
BAW
DRAWN
DC
CHECKED



MSA

Murray Smith & Associates, Inc.
Engineers/Planners
345 Holmiste Court, Suite 230 PHONE 208.947.9033
Boise, Idaho 83706 FAX 208.947.9034



MOLENAAR PARK IRRIGATION SUPPLY SYSTEM

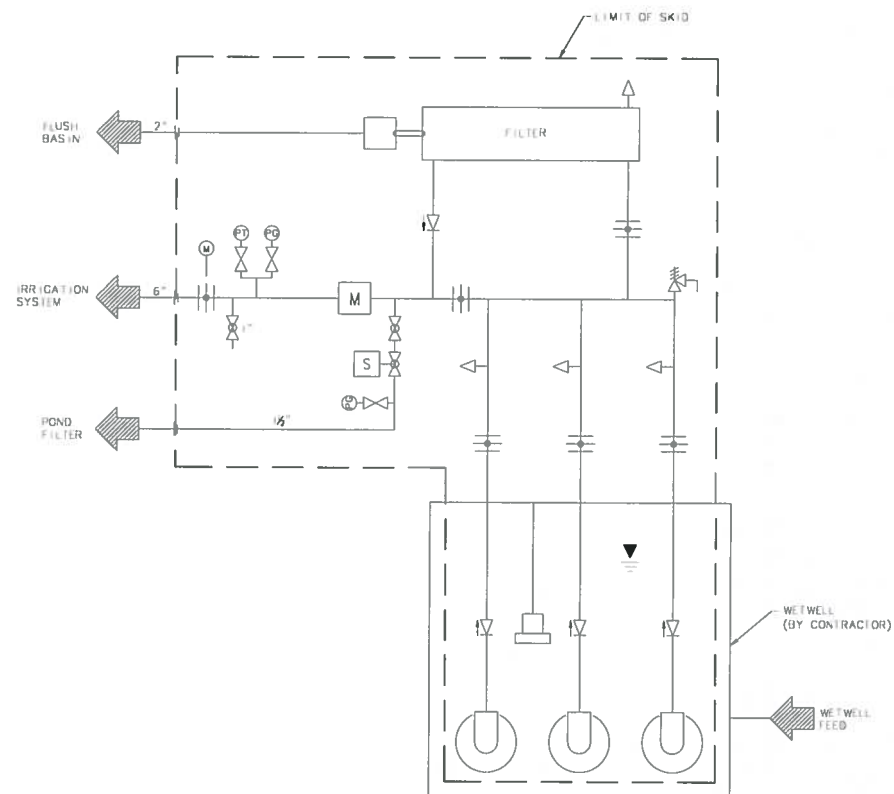
SYSTEMS SECTIONS

PROJECT NO. 14-67-507	SCALE AS SHOWN	DATE FEBRUARY 2015
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SHEET

M-2

10 of 14



PROJECT NO.	14-62-507	SCALE	AS SHOWN	DATE	FEBRUARY 2015
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Pond Seepage Rate Specification

3.3 Field Testing

- A. General: All field soils testing will be done by an independent testing laboratory of the CONTRACTOR's choice and approved by OWNER. Testing is at the CONTRACTOR's expense.
- B. Field density in-place tests will be performed in accordance with ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand- Cone Method, ASTM D 2922 - Standard Test Methods for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth), or by such other means acceptable to the ENGINEER. A minimum of four test location at equal spacing for each lift shall be provided.
- C. In case the test of the fill or backfill show non-compliance with the required density, the CONTRACTOR shall accomplish such remedy as may be required to insure compliance.
- D. When the pond is completed, it shall be filled slowly to protect the liner from erosion to the high water level. At the CONTRACTOR'S sole expense, the pond shall be tested over a minimum of five days and shall demonstrate it does not leak more than 0.5 inches per day. The CONTRACTOR shall present their testing plan to the ENGINEER and submit sufficient data to the ENGINEER that demonstrates the pond does not leak more than specified. If the pond leaks more than 0.5 inches per day, the contractor shall accomplish such remedy as may be require to insure compliance, at CONTRACTOR's sole expense.

END OF SECTION

Attachment C

Flow Rate and Volume Calculations

ETIdaho data - Open water - shallow systems (ponds, streams)

Boise WSFO Airport (NWS--101022)

<http://data.kimberly.uidaho.edu/ETIdaho/stcvrstats.py?station=101022&cover=55&stats=Deficit>

30-May-17

	mm/day												growing season	annual	Total
Monthly ^a	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
days/mo	31	28	31	30	31	30	31	31	30	31	30	31	634	634	
monthly ET (mm)		2.24	22.94	60.3	82.15	121.5	148.49	125.55	83.7	47.74					365 days/yr
monthly ET(ft)	0	0.007	0.075	0.198	0.270	0.399	0.487	0.412	0.275	0.157	0.000	0.000			694.61 mm/yr
															2.28 af/yr

Expected annual pond evap

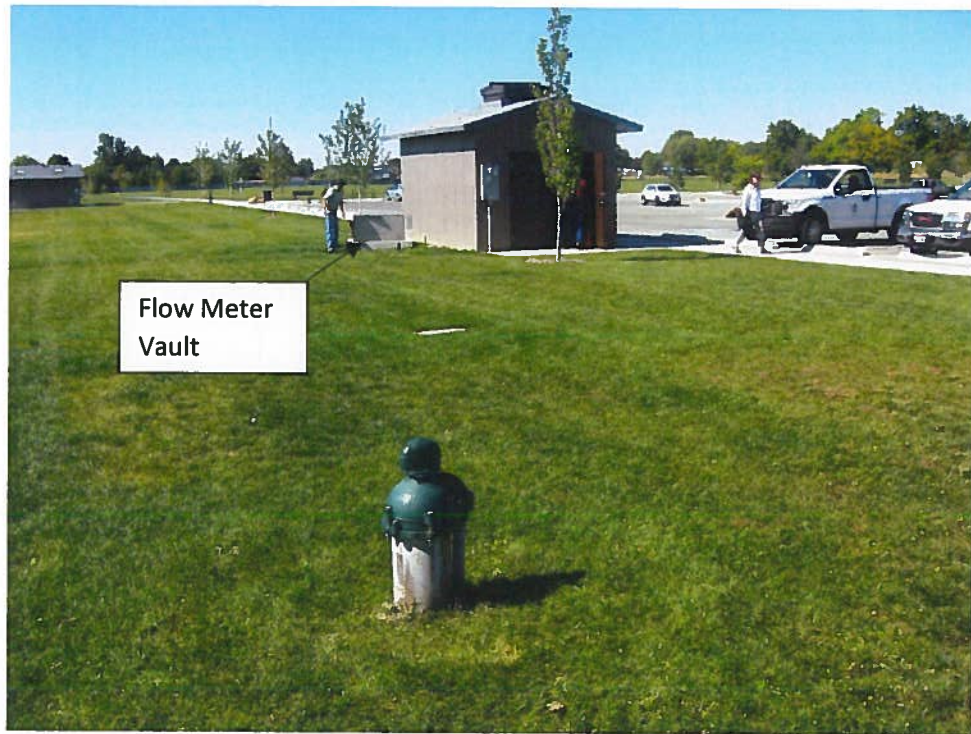
1 acre pond area

2.28 ft/yr pond evaporation during months with positive precipitation deficit

2.3 afy, annual pond evaporation (1.0 x 2.28)

Attachment D

Exam Photos



Flow Meter
Vault

Well and Pump House



M-Series Flow Meter



M-Series Flow Meter



Pressure Irrigation Pumping System Motor Controls



Surface Water Pump Station from Pond



BaseStation irrigation Controller



Surface Water Delivery Inlet to Pond



Pond Place of Use



Irrigation Place of Use

Attachment E
Proof of Beneficial Use