

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 97-7538

Exam Date: 07/20/2020

1. Current Owner:
JANA OSTLER 4672 GLEASON MC ABEE FALLS RD PRIEST RIVER ID 83853
2. Accompanied by: Jana Ostler
Phone No: 208-946-5353
Address: Same as above
Relationship to permit Holder: Permit holder

3. SOURCE:

SPRING
SURFACE RUNOFF

Tributary

SINKS

Method of Determination: Arcmap and DRG.

B. OVERLAP REVIEW

1. Other water rights with the same place of use: NO Overlap

Water Right No.	Source	Purpose of Use	Basis

Comments: _____

2. Other water rights with the same point-of-diversion: NO Overlap

Water Right No.	Source	Purpose of Use	Basis

Comments: _____

C. DIVERSION AND DELIVERY SYSTEM**1. LOCATION OF POINT(S) OF DIVERSION:**

SPRING NE¼ NE¼ SW¼, Sec. 8, Twp 58N, Rge 04W, B.M. BONNER County
SURFACE RUNOFF NE¼ SW¼, Sec. 8, Twp 58N, Rge 04W, B.M. BONNER County

Method of Determination: GPS. POD(s) are a spring located at -116°53.167, 48°23.561, and a pond earthen dam located at -116°53.157, 48°23.553.

PLACE OF USE: IRRIGATION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
58N	04W	8									0.2								0.2

Total Acres: 0.2

PLACE OF USE: STOCKWATER

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
58N	04W	8								X	X								

PLACE OF USE: STOCKWATER STORAGE and FIRE PROTECTION STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
58N	04W	8									X								

Method of Determination: Field exam and Arcmap aerial imagery.

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.

X Indicate weir size/pipe as applicable.

Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.

X Aerial Photo Attached (required for irrigation of 10+ acres).

X Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
1" POLY PIPE FROM SPRING					

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
NONE						

2. Measurements: A flow measurement from the spring source POD to a concrete catch basin was not able to be completed, as the 1" poly pipe routed underground and filled the concrete cistern from the bottom of the reservoir. A Manning's Flow Equation was used to derive a flow measurement of 0.03 cfs, which is recommended as the maximum diversion rate for licensing purposes.

E. FLOW CALCULATIONS

X Additional Computation Sheets Attached

Measured Method: Manning Equation was completed, using a 1 inch poly pipe (full) with rise of 3 feet and run of 12 feet, equaling a flow rate of **0.03 cfs**.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 0.2 \text{ acres} \times 3.0 \text{ afa} = 0.6 \text{ af}$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.01 \text{ cfs} \times 214 \text{ days} \times 1.9835 = 4.2$$

V = Smaller of V_{IR} and V_{DR} = 0.6 af, but as this is a surface water source, no volume metrics are applied to the irrigation beneficial use component for licensing purposes.

2. Volume Calculations for Other Uses:

See attached pond analysis sheet.

Stockwater annual volume = 12 head mixed stock x 12 gpd x 365 days = 52,560 gal / 325,850 gal per af = **0.2 af** considering department rounding standards.

Stockwater storage annual volume = **0.2 af**

Fire Protection storage annual volume = 0.1 af (pond capacity + 0.2 af (pond seepage and evaporation rates)) = **0.3 af**

G. NARRATIVE/REMARKS/COMMENTS

Field exam conducted on 7/20/2020 with the applicant, Jana Ostler, showed water being diverted from a spring to a small concrete cistern for irrigation and stockwater purposes. The applicant used a small ½ hp grundfos pump and pressure tank to route water uphill to for stockwater use by hose and irrigation use by hose and portable sprinkler at their respective POUs. A flow measurement from the spring source POD was not able to be completed, as the applicant's 1" poly pipe routed underground and filled a concrete cistern from the bottom of the reservoir. A Manning's Flow Equation was used to derive a flow measurement of **0.03 cfs** from the spring source POD, which is recommended as the maximum diversion rate for licensing purposes. The stockwater use diversion rate for licensing equals **0.02 cfs**, which is the department standard for 12 head of mixed stock. The irrigation use diversion rate for licensing equals 0.03 cfs per acre x 0.2 acres irrigation = **0.01 cfs**, considering department rounding standards. The sum of the stockwater and irrigation diversion rates equals the spring flow as determined using a Manning's Flow Calculation (see above).

The surface runoff source and spring source both flow to a concrete cistern where they co-mingle prior to beneficial use by the applicant. After both water sources mix, they overflow from the cistern to fill a small pond with an earthen dam for stockwater storage and fire protection storage uses. Due to the fact that both water sources co-mingle in the cistern, it is recommended they both remain on this license and not be split for licensing purposes. Due to both water sources being used from the cistern for irrigation and stockwater beneficial uses prior to overflow discharge filling the pond there is no diversion to storage beneficial use applied, and it was removed from the permit during licensing review.

During the field exam the applicant asserted the pond was used for storage purposes only, and that stock animals used the pond directly as a water source. The irrigation from storage and stockwater from storage beneficial uses were removed from the permit during licensing review. The stockwater storage and fire protection storage pond POU was sketched out during the field exam, and during licensing review Arcmap aerial imagery was used to trace out the pond surface area equaling 0.03 acres. The pond had a maximum depth of 3 feet, was shaped more like a bath tube equating to an average depth of 2 feet, a pond capacity of 0.1 af, and estimated seepage and evaporation loss of 0.2 af annually, and incorporated 0.2 af for stockwater storage purposes. Based on current pond analysis sheet calculations, the annual volume calculations for the pond recommended for the license equal:

- Stockwater storage annual volume = **0.2 af**
- Fire Protection storage annual volume = 0.1 af (pond capacity + 0.2 af (pond seepage and evaporation rates)) = **0.3 af**

The pond has a discharge pipe in the dam that allows overflow into a small area downgrade from the pond where it went to ground sinking on the applicant's property.

The irrigation beneficial use POU was sketched out during field exam and consisted of a fenced in large garden and small flower bed area. During licensing review, Arcmap aerial imagery was used to trace out the irrigation POU equal to 0.2 af. The annual volume associated with irrigation equals 0.2 acres x 3.0 afa = 0.6 af. Due to this being a surface source water

right, no annual volume was applied to the irrigation beneficial use, and no maximum diversion volume is applied to this water right. The applicant stated the method of irrigating by hose and small portable sprinkler was used daily, and the spring would refill the small concrete cistern each night.

The stockwater beneficial use POU consists of the applicant's fenced in parcel. The applicant has several stock pens and farm structures designed to house horses, cows, chickens, goats, and waterfowl. The term 'mixed stock' was retained during licensing review, and the annual volume applied to stockwater use equals 12 head mixed stock x 12 gpd x 365 days = 52,560 gal / 325,850 gal per af = **0.2 af** considering department rounding standards which is recommended for licensing purposes.

Condition 082, 26A, and X02 were removed from the permit during licensing review. Condition R66 was replaced with X31, describing irrigation of less than 1 acre of land. Conditions 219 and 220 were updated to reflect the pond storage components following the field exam. All other conditions on permit will remain on license. There are no overlap concerns for this water right.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
IRRIGATION	04/01 to 10/31	0.01 CFS	
STOCKWATER	01/01 to 12/31	0.02 CFS	0.2 AF
STOCKWATER STORAGE	01/01 to 12/31		0.2 AF
FIRE PROTECTION STORAGE	01/01 to 12/31		0.3 AF

Totals: 0.03 CFS

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☒ None

I. AUTHENTICATION Luke Bates - Water Resource Agent






Field Examiner's Name  Date 11/5/2020

Reviewer  Date 11/27/2020

State of Idaho
Department of Water Resources
Attachment to Field Exam
97-7538

STOCKWATER STORAGE and FIRE PROTECTION STORAGE system diagram.



-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters

0 0.025 0.05 0.1 Miles

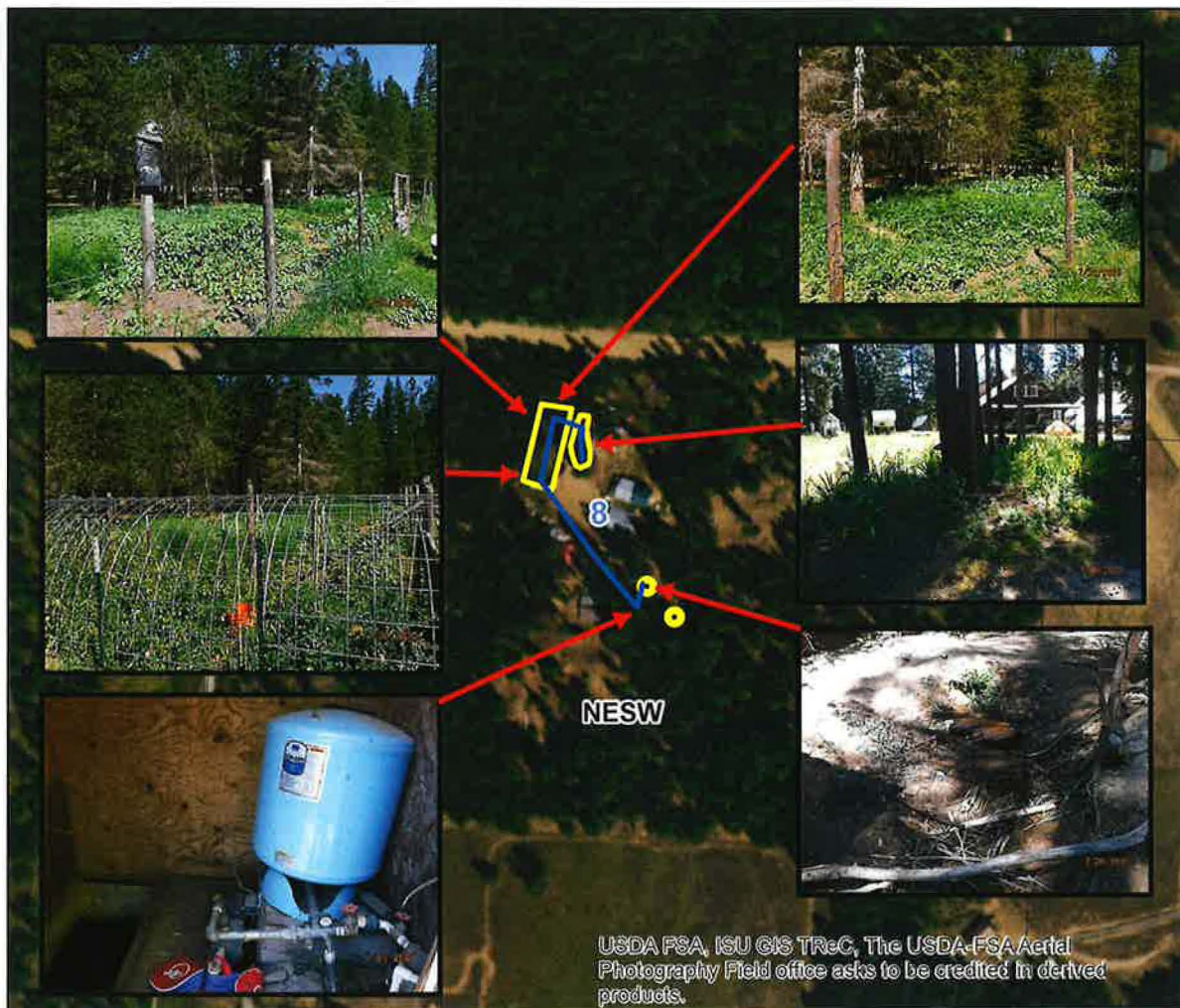







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IRRIGATION system diagram.

04W

58N



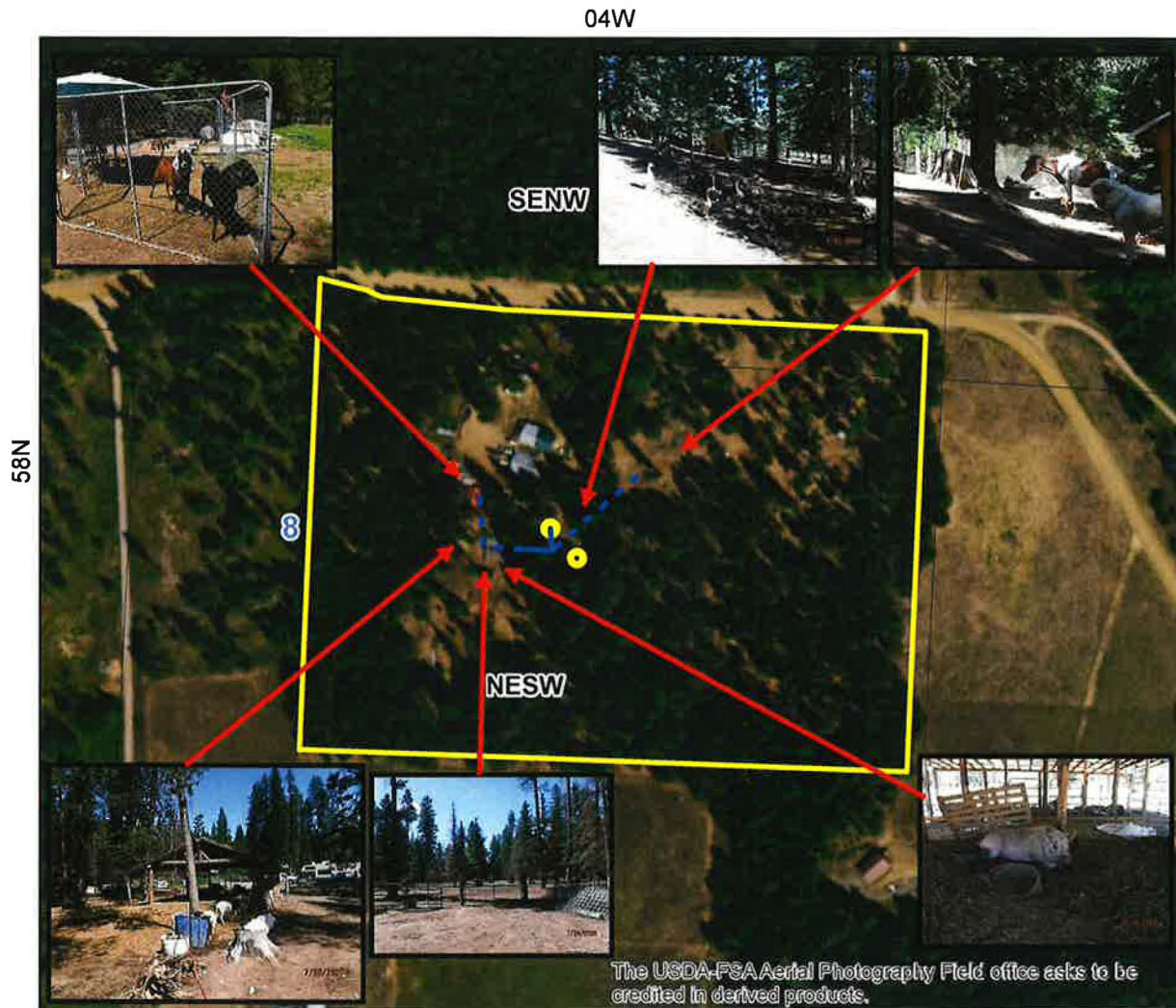
-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters

0 0.035 0.07 0.14 Miles



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STOCKWATER system diagram.



- Point of Diversion
- Place Of Use Boundary
- Townships
- PLS Sections
- Quarter Quarters

0 0.035 0.07 0.14 Miles



Manning's Equation Calculator for Flow Rate in a Circular Conduit Flowing Full $S = 0.2500$ ft/ft $n = 0.009$ manning's coefficient $d = 1.0$ pipe diameter (inches) $D = 0.08$ pipe diameter (feet) $r = 0.04$ pipe radius (feet) $A = 0.01$ area (ft²) $WP = 0.26$ wetted perimeter (ft) $R = 0.02$ hydraulic radius (ft) $Q = 0.03$ flow rate (CFS)**Channel Slope**

Slope Options



Manual Entry



Slope Calculator

Slope Calculator

Rise = 3 feet

Run = 12 feet

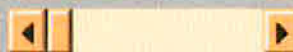
Slope, $S = 0.2500$ ft/ft

Pipe Material, (n):



plastic (pvc, abs)

Pipe Diameter (inches)



1.0 inches

Total Storage Calculations

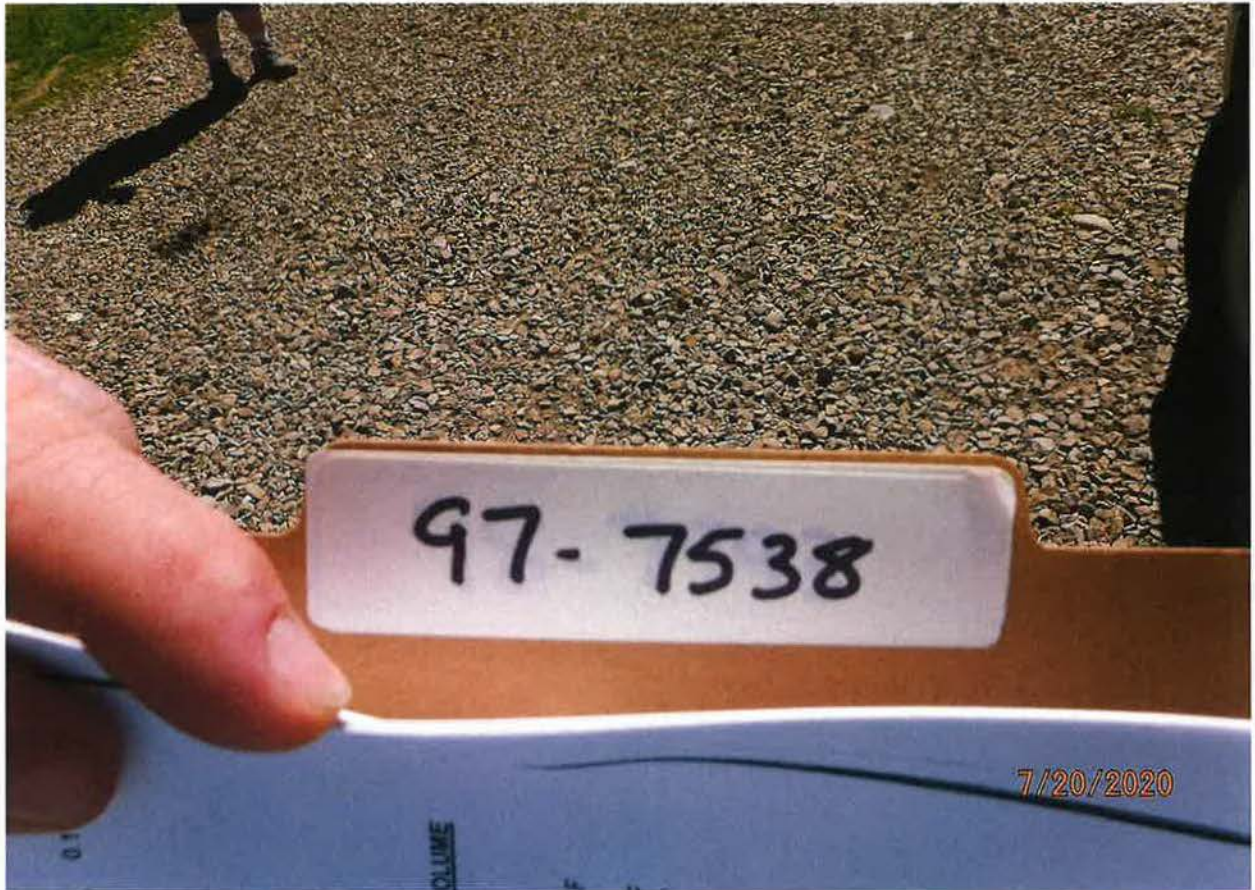
FILE NUMBER	97-7538
REVIEWER	Luke Bates
DATE	11/4/2020

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.

User Input
Calculated value
Formula Explanations

Surface Area (AC.)	0.03	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	2	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you know the maximum depth and not the average depth, the Field Examiner's Handbook suggests multiplying the maximum depth by 0.4 to get the average depth, or you can use any method that seems reasonable to attain average depth.
Pond Capacity (AF)	0.1	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.

Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	0.2	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 acre feet from the initial fill = 5 acre feet of additional storage needed). Note: You must have a "From Storage" component exceeding the initial fill on the permit to include a volume in this space.
Estimated Seepage Loss (AF)	0.1	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.1	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	0.5	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Loss, and Evaporation Loss amounts to determine the total amount of storage required.



POD – SPRINGWATER ROUTED USING POLY PIPE TO 24HR STORAGE CONTAINMENT



POD – SPRING WATER WITH POLY PIPE TO 24HR STORAGE CONTAINMENT



SPRING WATER OVERLAND FLOW TO 24HR STORAGE CONTAINMENT



SHED WITH 24HR USE STORAGE CISTERN IN FLOOR AND PUMP HOUSE





25 PSI PUMP OPERATING PRESSURE



1/2 HP GRUNDFOS PUMP FROM 24HR STORAGE CONTAINMENT TO POU USES



STOCKWATER STORAGE AND FIRE PROTECTION STORAGE POU





EARTHEN DAM FOR SMALL POND



DISCHARGE PIPE FROM POND



STOCKWATER POU





STOCKWATER POU





STOCKWATER POU





STOCKWATER POU





IRRIGATION POU





IRRIGATION POU

