Rainwater Irrigation and Storage Calculations

PLN: 13374,13337,13367,13336,13356,&13365

Over view:

Water for cannabis irrigation and the operations buildings will be supplied entirely by an integrated rainwater catchment system. The system will utilize three rainwater catch ponds and 7 separate tank locations to distribute rainwater to PLN: 13374,13337,13367,13336,13356,&13365 .

The combination of rainwater sources will provide over 2,526,197 gallons of water in very low rainfall years, plenty to meet the 1,904,202 gallon projected irrigation and domestic need, including consideration for evaporation from the pond. The breakdown of water catchment, water use, and water storage numbers are provided below.

Although the 50 year average for annual rainfall is 66.68", the rainfall volumes below are calculated using the average precipitation value in the ten lowest rain years (40.105").

*See rainfall data Page 4
*See water distribution system Page 3

Calculations

Volumes by source:

Pond #1 APN 218-051-008 PLN: 13374 potential volume of water availability calculated using low average rainfall. 74,479sf x 40.105" x 0.6234= 1,862,084gallons

Pond #2 APN 218-190-001 PLN: 13365 potential volume of water availability calculated using low average rainfall. 15,981sf x 40.105" x 0.6234= 399,548gallons

Pond #3 APN 218-071-003 PLN: 13336 potential volume of water availability calculated using low average rainfall. 10,582sf x 40.105" x 0.6234= 264,565gallons

*Note: although the 50 average for annual rainfall is 66.68", the rainfall volume above is calculated using the average precipitation value for the ten lowest rain years in the available data set (40.105")

Total water volume available in low rainfall years: 2,526,197gallons

Estimated water use:

PLN#: 13374=276,840
PLN#: 13337=386,812
PLN#: 13367=140,000
PLN#: 13336=456,200
PLN#: 13365=530,300
PLN#: 13356=114,050
=1,904,202

Evaporation Loss:

Willow creek 1 NW
Monthly Pan evaporation (inches)

	Period of record	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	oct	Nov	Dec	Total
WILLOW CREEK 1 NW	1968-2005	0.58	1.35	1.81	2.74	4.73	6.50	7.53	6.05	3.79	1.94	0.75	0.92	38.69

*multiply by .7 correction factor for offset heat exchange

Pond surface area (Median): (P#1- 4,356)+(P#2-1,525)+(P#3-12,851) = 18,731

Class A Pan seasonal evaporation rate-37 year average: 38.69'
Corrected Pan evaporation: 38.69x.7= 27.083'/12= 2.257ft

median surface area x corrected pan evaporation rate
18,731sf.x2.257ft=42,275.867cf.
x7.48052gallon conversion
= 316,245gallons

Annual water need: (=1,904,202 use) + (316,245 evap-loss) = Gallon 2,220,447

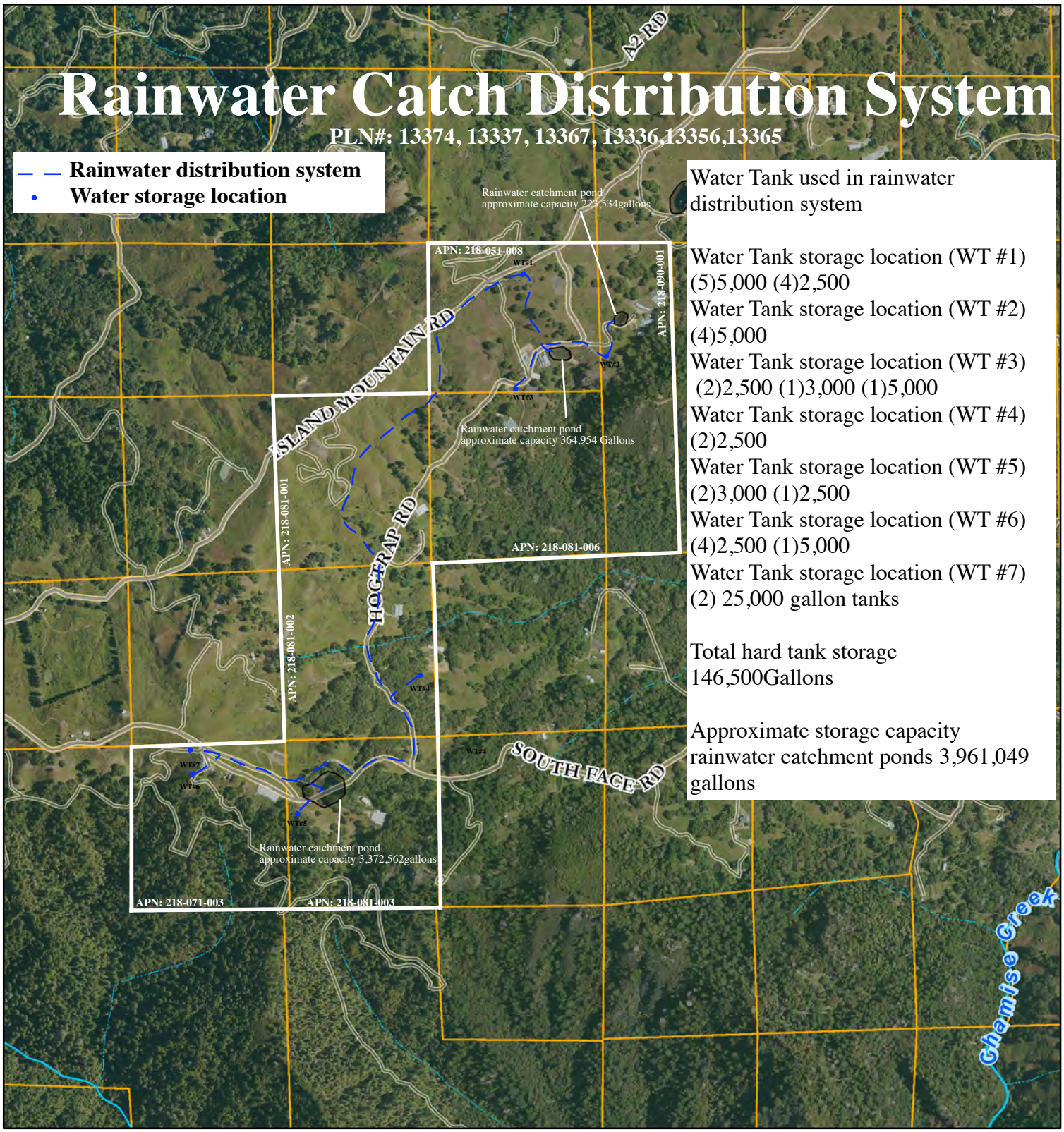
Total water volume available in low rainfall years: 2,526,197gallons

Sources:

Rainfall records: https://prism.oregonstate.edu/explorer/
Evaporation Loss: https://wrcc.dri.edu/Climate/comp_table_show.php?stype=pan_evap_avg

Rainwater Catch Distribution System

PLN#: 13374, 13337, 13367, 13336,13356,13365



Water Tank used in rainwater distribution system

Water Tank storage location (WT #1) (5)5,000 (4)2,500
Water Tank storage location (WT #2) (4)5,000
Water Tank storage location (WT #3) (2)2,500 (1)3,000 (1)5,000
Water Tank storage location (WT #4) (2)2,500
Water Tank storage location (WT #5) (2)3,000 (1)2,500
Water Tank storage location (WT #6) (4)2,500 (1)5,000
Water Tank storage location (WT #7) (2) 25,000 gallon tanks

Total hard tank storage 146,500Gallons

Approximate storage capacity rainwater catchment ponds 3,961,049 gallons

Humboldt County WebGIS

Humboldt County Planning and Building Department

Highways and Roads
- Principal Arterials
- Minor Arterials
- Major Collectors
- Minor Collectors
- Local Roads

- Private or Unclassified
- Major River or Stream

Blue Line Streams
- Perennial 1-3
- Perennial >4

- Intermittent
- Subsurface
- City Boundary
- City Boundary (750K)
- Counties
- Parcels (no APN labels)

0 0.125 0.25 0.5 mi

RF= 1:18,056 1 in = 1,505 ft

N W E S

8/2/2024, 9:29:19 AM Web AppBuilder 2.0 for ArcGIS

Table 1

PRISM Time Series Data		
Location: Lat: 40.0366 Lon: -123.5964 Elev: 1762ft		
Climate variable: ppt		
Spatial resolution: 4km		
Period: 1970 - 2020		
Dataset: AN91m		
PRISM day definition: 24 hours ending at 1200 UTC on the day shown		
Grid Cell Interpolation: Off		
Time series generated: 2024-Jul-25		
Details: http://www.prism.oregonstate.edu/documents/PRISM_datasets.pdf		
Date	ppt (inches)	ppt(inches
1970	89.23	
1971	61.78	
1972	62.48	
1973	92.57	
1974	71.21	
1975	76.59	
1976	31.43	31.43
1977	52.04	
1978	60.3	
1979	68.49	
1980	60.23	
1981	83.06	
1982	91.54	
1983	125.52	
1984	61.43	
1985	36.87	36.87
1986	80.96	
1987	64.79	
1988	50.97	50.97
1989	44.98	44.98
1990	46.44	46.44
1991	38.61	38.61
1992	64.15	
1993	69.91	
1994	48.13	48.13
1995	102.74	
1996	98.09	
1997	66.06	
1998	103.01	
1999	66.78	
2000	58.82	
2001	63.49	
2002	71.17	
2003	70.7	
2004	57.68	
2005	86.05	
2006	76.67	
2007	48.56	48.56
2008	51.11	
2009	53.97	
2010	92.29	
2011	58.58	
2012	90.43	
2013	21.48	21.48
2014	64.93	
2015	51.01	
2016	98.31	
2017	86.93	
2018	54.97	
2019	77	
2020	34.03	34.03
Average	66.68	
Low rainfall years		40.105