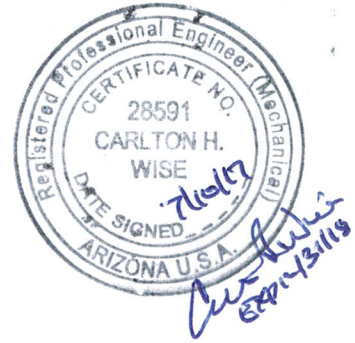

ALTERNATIVE ON-SITE SEWAGE SYSTEM FOR MR. BORUSHKO



Alternative Septic System for:

**Apache County Road N1332, Hidden Meadow Ranch
Lot 46, The Club at Hidden Meadow Ranch
APN 106-79-046 (1.38 acres)
N 34° 08' 32.46" W 109° 32' 0.024"
Section 25 Township 9N Range 26 E**

July 7, 2017

Property Owner:

**Mr. Mark Borushko
1721 East Mallory Street
Mesa AZ 85203**

Prepared By: Carlton H. Wise, P.E.

P.O. Box 1627
Springerville AZ 85938
(928) 333-2297
AZ Registration 28591

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INTRODUCTION

This property is located in Hidden Meadow Ranch. Vegetation is primarily native grasses and ponderosa pine trees. The lot slopes to the Southeast. Soil is 5 ft. of sandy clay loam over a layer of sandy clay loam with more than 50% rock. This area meets the requirement for a CAP Alternative System.

GENERAL REQUIREMENTS: AVAILABILITY OF SEWER HOOK UP

As required by ADEQ, an on-site wastewater treatment and disposal system is prohibited when connection to a sewer is determined by ADEQ as practical

The subject property is not located within 400 feet of a public sewer and connection to a public sewer is not possible.

All conditions required for an on-site wastewater system in accordance with R18-9-A309(A) will be complied with. All flows to the system will be household waste. Flows to the system, present and future, can not exceed the 450 gal/day design flow.

4.17 Cap System

Daily Design Flow for:

Mr. Borushko

106-79-046

3 Bedroom House

3 Low flow toilets @ 3 fixture units each = 9 fixture units

3 Lavatory sinks @ 1 fixture unit each = 3

2 Tub/shower @ 2 fixture units each = 4

1 Kitchen sink @ 2 fixture units = 2

1 Clothes Washer @ 2 fixture units = 2

TOTAL 20 Fixture Units

Site Evaluation Data

Percolation testing shows the receiving soil has a SAR of 0.4 gpcf

Flow Calculations

From the Daily Design Flow Chart, the daily flow for the two bedroom home with a fixture count of 16 dfu is 450 gal/day and requires a 1,000 gal. septic tank.

Absorption Area: From the Cap Trench Drawing the absorption area is 5 sf/linear ft.

Absorption: $0.4 \text{ gpd} \times 5 \text{ sf/lf} = 2.0 \text{ gal/linearft/day}$

Trench Length: $450 \text{ gpd} / 2.0 \text{ gpft} = 225 \text{ ft.}$
Three trenches at 75 ft. are required

Hydraulic Analysis:

Horizontal Loading: The Tyler and Kuns allowable linear loading rate for a sandy clay loam soil with 4% slope and 4' infiltration is 2.5 gal/ft

Horizontal Absorption:	$75' \times 2.5 \text{ gpf} =$	187.5gpd
Vertical Absorption:	$1425 \text{ sf} \times 0.2 \text{ gpd/sf} =$	285
Total		472.5 gpd

Effluent will not surface. There is four feet of soil below the trenches. Fractured rock in the restrictive layer will allow effluent to penetrate this layer since there is sand surrounding the rocks.

Setback

Property Lines*	5	5
Wells	100	100
Live Streams	100	100
Lake or Reservoir	100	100
Dry Wash	50	50
Domestic Service Water Line	5	5
Cuts on Sloping Terrain	15	15
Driveway	5	5
Swimming Pools	5	5

*Without Central Water System (Well) 50 ft.

** Or minimum trench spacing, the greater

Bill of Materials

Cap System Disposal

Borushko Residence

APN: 106-79-046

3" diameter perforated leach pipe: 225 ft.

3" and 4" fittings and adaptors: as required

Distribution Box: In accordance with R18-9-302(C)(1)(d)

Septic Tank: ADEQ approved 1000 gal. tank in accordance with R18-9-A314

Septic Tank Riser: Perkins Precast Tank Lid, Riser and Accessories or equivalent.

Septic Tank Filter: Perkins Precast or equivalent

Two Way Cleanout: 1 ea.

Geotextile Cloth: 75 sq. yds.

Leach Rock: clean graded rock $\frac{3}{4}$ " – 2 $\frac{1}{2}$ " diameter: 38 cu. yds.

Backfill: Native sandy clay loam soil with no rock over 2": 63 cu. yds.

**Construction Notes
For
Septic Tank,**

1. The septic tank site shall be excavated such that elevations shown on the plans are properly maintained. The site selected for tank placement must be an area which is not subject to flooding or sliding and has stable soil conditions. Before excavation, underground utilities should be located. Excavations must be made to allow enough room around the tank for proper bedding and for adequate compaction. The bottom of the excavation must be level with no high spots.
2. All tanks and equipment shall be set on a compacted bed of 3/8" minus sand, gravel, or cinders. This bedding layer shall be 4" to 6" thick and compacted. Proper use of bedding materials is essential for longevity of the tank and for proper function. Bedding material must provide a uniform load bearing surface so that the tank will not have differential settlement. Sand is the bedding material of choice. The areas of tank flanges must be trenched out. The tank must be lifted by placing straps around the tank. The tank must not be dropped into position. The tank must be checked for levelness.
3. All pipes to be bedded with 4" of 3/8" minus sand, gravel, or cinders on the bottom and top of the pipe.
4. The tank perimeter must be back filled with 3/8" minus sand, pea gravel, or cinders. Fiberglass septic tanks require the top 2' of backfill to be sand. Back fill must be worked by hand completely beneath the tank body and ends to provide complete support. Flooding or jetting can not be used to compact or settle back fill. Top soil shall be installed in the top two feet of the excavation and compacted and graded such that water will be drained away from the tank area.
5. The tank and disposal system shall be located away from drainage or discharges from down spouts and accessible for septage pumping.
6. Setback requirements shall be identical to those required in the Aquifer Protection Rule and listed elsewhere in this document.
7. The sewer line from the building to the septic tank shall be sloped at 1/4" per linear foot. A two way cleanout shall be placed on the sewer line within 5 ft. of the structure, at every 50 ft. thereafter and at each aggregate horizontal change in direction exceeding 135 degrees.
8. All tanks, filters, pumps, and ancillary equipment shall be installed in accordance with manufacturers instructions which can be found in the owners' manual. Failure to comply with these standards may void the equipment warranty.

9. All tanks and pressure distribution lines shall be leak tested in accordance with ADEQ procedures and standard engineering practices. (Reference ASTM C 1227-94; water or vacuum testing.) Prior to back filling the tank excavation water is to be placed in the tank so that water level remains above back fill level. Do not completely fill tank before backfill. All leaks and weep holes to be patched. All plumbing connections below grade must be watertight. Seal all joints between components.

10. All work to be done in accordance with NEC and UPC codes and in accordance with ADEQ and Apache County regulations.

**Operation and Maintenance Requirement
Cap System
APN: 106-79-046**

1. The owner shall not allow irrigation of the cap bed.
2. The Cap must be protected from vehicle loads and other damaging activity
3. Septic tank compartment must be inspected annually for leakage, sludge and scum levels.
 Compartment must be pumped if levels exceed ADEQ requirements
 - a. Pump when bottom of scum level is 3" or more from the inlet to the outlet sanitary tee.
 - b. Pump when the top of the sludge layer is 12" or less from the inlet to the outlet sanitary tee.
4. Clean the effluent filter in the septic tank and inspect tank cap for watertightness.
5. Manage vegetation planted on the distribution trenches.
6. Maintain drainage berms, protective barriers, cover materials, and other features.
7. Maintain integrity of the reserve area for future use.

1 Authorization For Site Investigation

I certify that I am (check one) the Owner, the Authorized Representative or an Other Person and have authority to grant the investigator access to the property for this site investigation and authorize the work certified in this site assessment.

Name & Address

(Printed)

Carlton H. Wise, P.O. Box 1627, Springerville AZ 85938

Signature

Carlton H. Wise

2 Project Identification

Property Owner or Project Name 3 BR Residence for Mr. Borushko @ 106-79-046

3 Site Information [A.A.C. R18-9-A309(B)(2)(a)]

Address CR N1330 & N1332 City Greer
 Parcel Number 106-79-046 Lot Number 46, Ranch @ Hidden Meadows
 Township 9N Range 26E Section 25
 Latitude 34 ° 08 ' 32.46 " N Longitude 109 ° 32 ' 0.024 " W

4 Investigator Information [A.A.C. R18-9-A310(H)]

Name Carlton H. Wise Phone 928-333-2297
 Title P.E. Firm Name Carlton Eng. Inc
 Mailing Address PO Box 1627 City Springerville State AZ
 Zip 85938 E-Mail _____

5 Surface Characterization [A.A.C. R18-9-A310(C)]

Identify the presence or absence of all of the following possible limiting conditions in the intended location of the treatment works and the primary and reserve areas of the on-site wastewater treatment facility:

- A) The surface slope is greater than 15 % at the intended location of the on-site wastewater facility YES No
- B) Setback distances do NOT meet all the minimum values specified in R18-9-A312(C) YES No
 NOTE: Check YES if the location or size of the dwelling or other improvements, or the bedroom count or the fixture unit count is UNKNOWN to the site investigator.
- C) Surface drainage characteristics could adversely affect the ability of the facility to function properly
 YES No NOTE: If YES, please describe in Attachment 4.
- D) A 100-year flood hazard zone, as indicated on the applicable flood insurance rate map, is located within the property on which the on-site wastewater treatment facility will be installed YES No NOTE: If YES, please specify the FEMA Flood Insurance Map Number or Other Source _____
- E) An outcropping of rock that cannot be excavated is present and could impair the function of soil receiving the discharge
 YES No
- F) Fill material deposits are present YES No

If the answer is YES to any of the above potential surface limiting conditions, please show location and note the condition type on Site Investigation Map (Item 7).

6 Subsurface Characterization Method [A.A.C. R18-9-A310(D)]

Check method used to perform subsurface characterization per A.A.C. R18-9-A310(D)(1) and (3)

- A) ASTM D5921 used? Yes No (if Yes, please enclose Attachment 1)
- B) Percolation test method used? Yes No (if Yes, please enclose Attachment 2)
- C) Seepage performance test method used? Yes No (if Yes, please enclose Attachment 3)
- D) Other ADEQ approved method? Yes No (if Yes, please provide in Attachment 4 the method and data)

7 Site Investigation Map Showing the Location of Limiting Conditions and Setbacks from Features and Improvements [A.A.C. R18-9-A309(B)(2)(a)]

A. CHECK below the features shown on the Site Investigation Map. **WRITE N/A** if item is **NOT PRESENT**. **RECORD** below the separation (feet) that will be maintained between the system and the checked feature.

<u> </u> Water supply well <u>>100</u> (ft)	<u>N/A</u> Boundary of 100-year flood hazard zone <u> </u> (ft)
<u>25</u> Water main or branch water line <u> </u> (ft)	<u>N/A</u> Drainage easement or wash with
<u>10</u> Domestic service water line <u> </u> (ft)	drainage area more than twenty acres <u> </u> (ft)
<u>N/A</u> Drinking water intake from	<u>N/A</u> Other Easement <u> </u> (ft)
a surface water source <u> </u> (ft)	<u>N/A</u> Downslope cut banks and culvert or roadway ditches <u> </u> (ft)
<u>N/A</u> Perennial or intermittent stream <u> </u> (ft)	<u>N/A</u> Planned cut bank over 2 feet deep <u> </u> (ft)
<u>N/A</u> Lake, reservoir, or canal <u> </u> (ft)	<u>N/A</u> Wall or planned wall over 2 feet high <u> </u> (ft)
<u>N/A</u> Pond or other water feature <u> </u> (ft)	<u> </u> Driveway or parking area <u>5</u> (ft)
<u>N/A</u> Swimming pool <u> </u> (ft)	<u>N/A</u> Storage Area <u> </u> (ft) <u> </u> Earth fissure <u> </u> (ft)
<u> </u> Planned building <u>10</u> (ft)	<u>N/A</u> Other <u> </u> (ft) Describe: <u> </u>
<u>N/A</u> Existing building <u> </u> (ft)	

B. Minimum setback distances are within the limits specified in R18-9-A312(C); Yes UNKNOWN No
Check UNKNOWN if the dwelling location or size (including building footprint, bedroom count & fixture unit count), or the location of other improvements is not known to the person performing the site investigation.

C. Show all soil test locations. Show any condition or feature observed during the site investigation which may affect on-site system design & is located within the **SITE INVESTIGATION AREA (defined as the planned excavation boundaries for the treatment works, primary disposal area and reserve disposal area plus the surrounding area out to 100 feet)** including :
(1) Show land surface contours at appropriate intervals when the elevations across the Site Investigation Area differ by more than 5 feet, and
(2) Any other factor is observed that may affect system design regardless of property ownership (please include the Site Investigation Map with Attachment 4 if the information cannot be depicted on the below Grid).

See Attached

8 Subsurface Limiting Conditions [A.A.C. R18-9-A310(D)(2)]

Identify the presence or absence of all of the following possible limiting conditions in the intended location of the primary and reserve disposal areas of the on-site wastewater treatment facility to a depth of at least 12 feet below land surface or to an impervious soil or rock layer if encountered at a shallower depth:

- A) The soil absorption rate determined under A.A.C. R18-9-A312(D)(2) is:
 - 1. More than 1.20 gallons per day per square foot? Yes No
 - 2. Less than 0.20 gallons per day per square foot? Yes No
 - 3. A **site-specific soil absorption rate (SAR)** is required per A.A.C. R18-9-A312 (D)(2)(b)? Yes No
- B) The vertical separation distance from the bottom of the lowest point of the disposal works to the seasonal high water table is less than the minimum vertical separation specified in A.A.C. R18-9-A312(E)(1)? Yes No
- C) Does seasonal saturation occur within surface soils that could affect the performance of the on-site wastewater treatment facility? Yes No If Yes, describe evidence: _____
- D) Do any of the following subsurface limiting conditions that may cause or contribute to surfacing of wastewater occur within 12 feet of the land surface:
 - 1. An impervious soil or rock layer? Yes No
 - 2. A zone of saturation that substantially limits downward percolation from the disposal works? Yes No
 - 3. Soil with more than 50 percent rock fragments? Yes No
- E) Do any of the following subsurface limiting conditions that may promote accelerated downward movement of insufficiently treated wastewater occur within 12 feet of the land surface:
 - 1. Fractures or joints in rock that are open, continuous, or interconnected? Yes No
 - 2. Karst voids or channels? Yes No
 - 3. **Highly permeable materials** such as deposits of cobbles or boulders? Yes No
- F) Does subsurface conditions exist that may convey wastewater to a Water of the State and cause or contribute to an exceedance of a water quality standard established in 18 A.A.C. 11, Articles 1 and 4? Yes No
- G) Depth to groundwater below land surface 107 feet as determined by Trench or boring, Subdivision report, Published groundwater data or Relevant well data.

If the answer is Yes to any of the above subsurface limiting conditions, please show location and note the associated limiting condition type on Site Investigation Map (Item 7).

9 Site Investigation Attachments

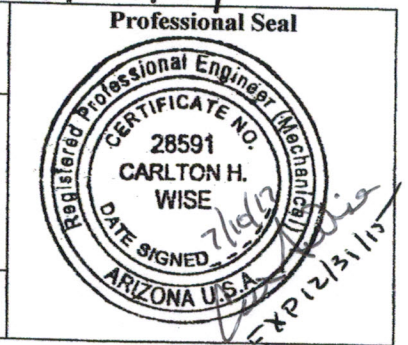
#	Attachment Description	Attached?
1	Soil Analysis	<input checked="" type="checkbox"/> Yes, total of 1 pages.
	Well Data	<input checked="" type="checkbox"/> Yes, total of 1 pages.
		<input type="checkbox"/> Yes, total of _____ pages.

10 Investigator Certification

- A) Arizona-registered Professional engineer Certification Number: 28591 Expiration Date: 12/31/15
- B) Arizona-registered Professional geologist Certification Number: _____ Expiration Date: _____
- C) Arizona-registered Sanitarian Registration Number: _____ Expiration Date: _____
- D) A certificate of training from a course recognized by ADEQ
 Course Name: Soil Analysis Completion Date: 4/01/09
 Qualifies under another category designated in writing by ADEQ. Please use
 Attachment 4 to provide approved Qualification Category & Date Approved.
- E) _____

By signing this section, I certify that I am qualified to conduct this investigation as specified in R18-9-A310(H) and have inspected the property identified in Item 3 for purposes of performing a site investigation. I have performed this site investigation in accordance with R18-9-A310 and have completed this investigation to the best of my knowledge.

Printed Investigator Name/ Date of Investigation: Carlton H. Wise 7/7/17
 Investigator Signature/ Date Signed: Carlton H. Wise 7/10/17



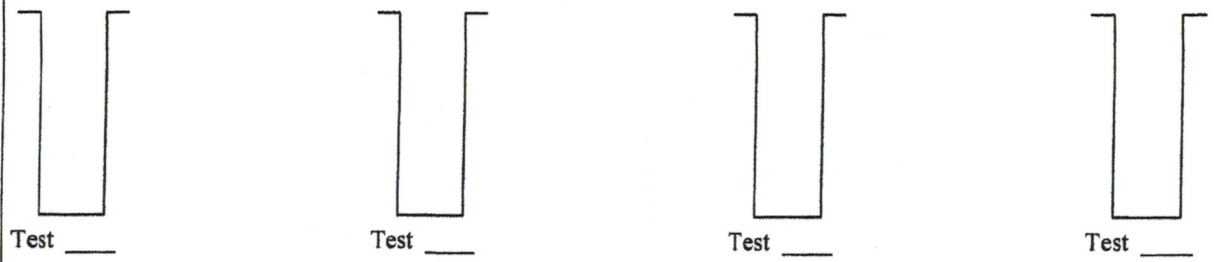
ATTACHMENT 1, CONTINUED – ASTM 5921 METHOD FOR SUBSURFACE SOIL CHARACTERIZATION

Facility Address: ACR N1330 & N1332
 Tested by: Carlton H. Wise
 Date Test Completed: 2/7/17

Parcel Number: 106-79-040
 Depth to Groundwater: PLEASE REPORT IN ITEM 8.G ON PAGE 3 OF FORM

Test Hole #	Depth Interval Below Land Surface (Inches)	Texture	Structure	Rock Fragments %	Mottles %	Boundary	Dry Consistency	Moist Consistency	SAR
1	0-60"	SCC/M	2/M/SBk	10%	None	C/W	SH	FR	0.4
	60"		Rejection	75% Large					
2	0-60"	SCC/M	2/M/SBk	10%	None	C/W	SH	FR	0.4
	60"		Rejection	75% Large					
3	0-60"	SCC/M	2/M/SBk	10%	None	C/W	SH	FR	0.4
	60"		Rejection	75% Large					

Comments: 1/4 - 1/2" ribbon



Professional Seal





Director
Thomas Buschatzke

ADWR
Arizona Department of Water Resources

eGovernment



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Well Registry Search

Enter Township Range

Township	Half	N/S	Range	Half	E/W	Section	Q160	Q40	Q10
9	No	N	26	No	E	25			



Start Over

Back

View Results

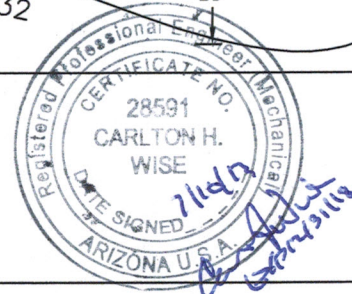
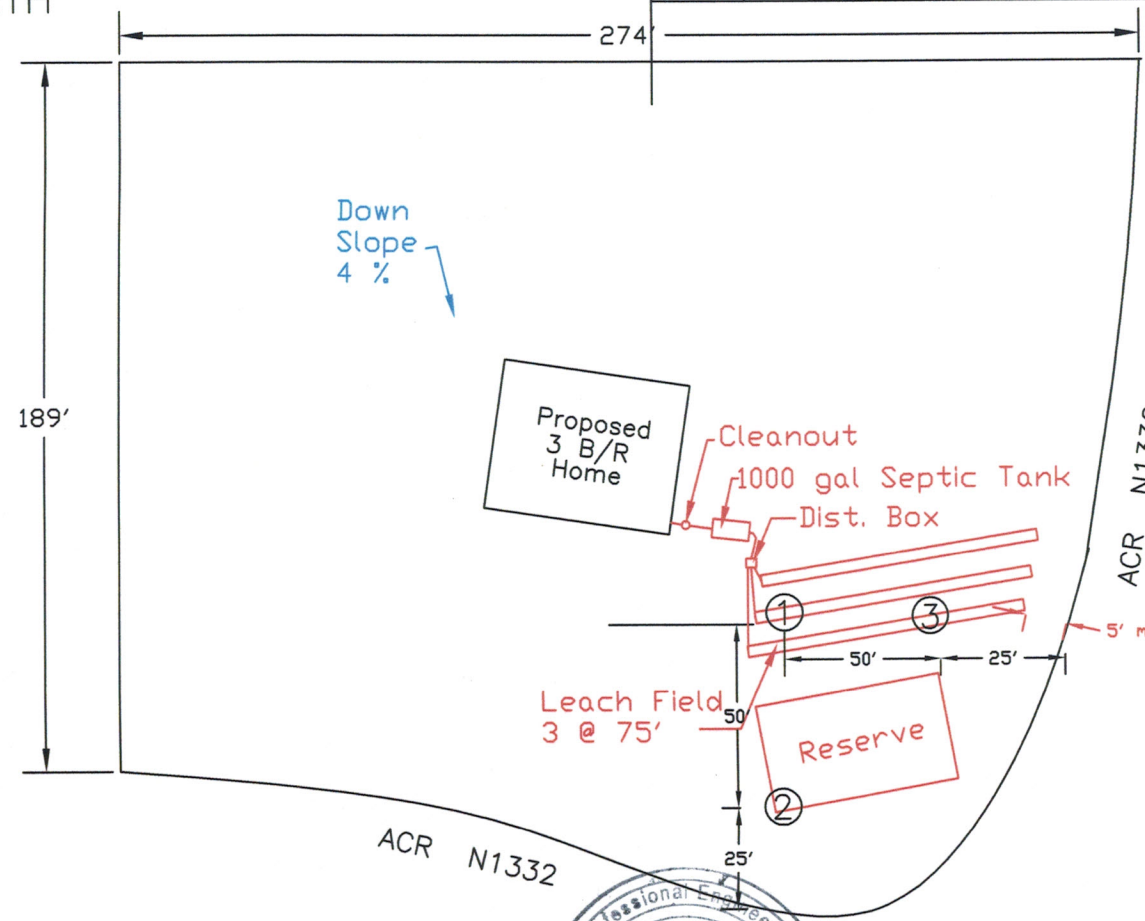
Well Info
 Imaged Record
 Map
 Data Export
 Pump Data Export
 Help

Filter Well Type: No Filter / All Well Types

Water Level

Reg No.	GWSI Site ID	Cadastral	Owner Name	Well Type	Well Depth (ft)	Casing Depth (ft)	Case Dia (in)	Drill Date
587523		A09026025DAD	AM RANCH COMPANY LLC	EXEMPT	500			8/15/10

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



Site Evaluation for: Mr Borushko
 Parcel: 106-79-046 (1.07 acres)

ACR N 1330 & N1332
 Central Water

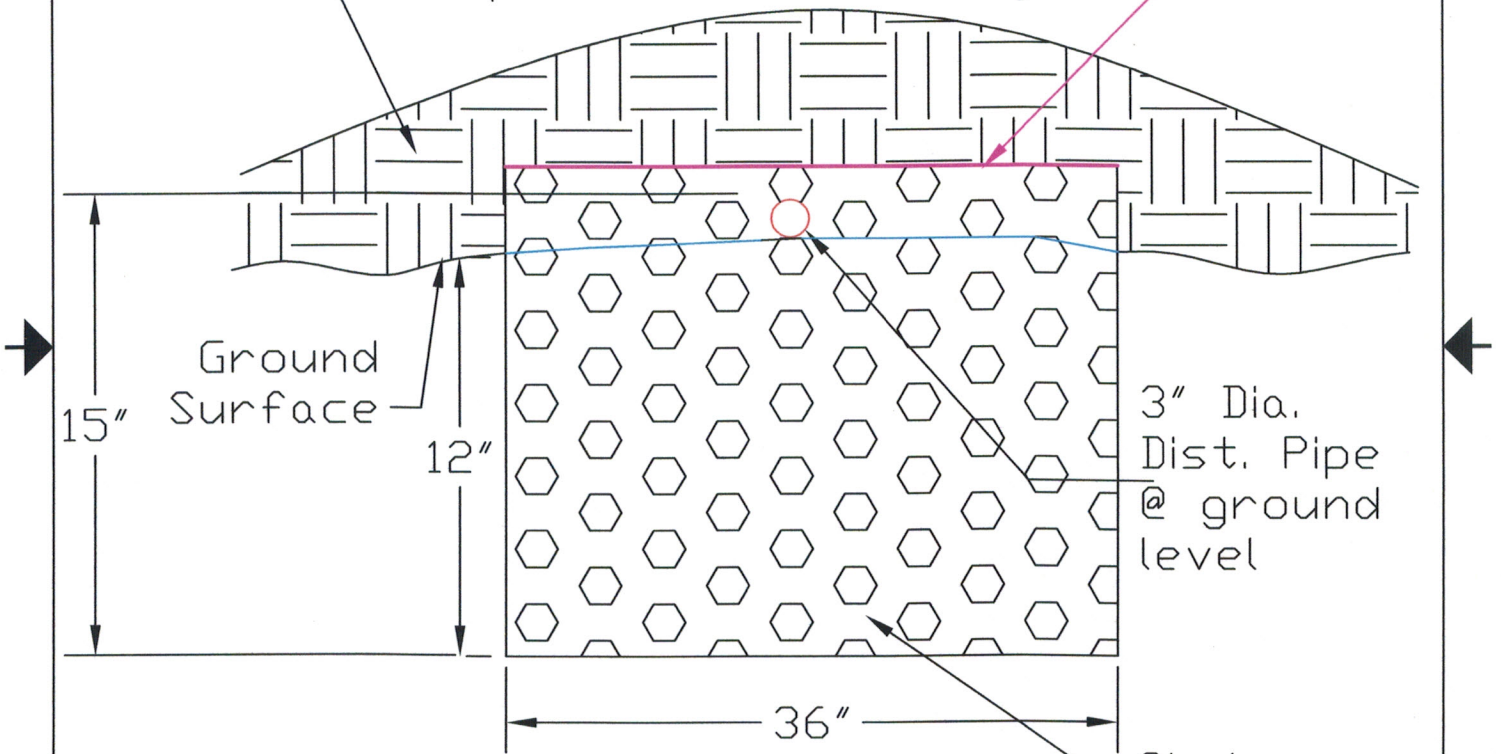
○ Test Hole

7/7/17	SIZE A	FSCM NO.	DWG NO.	REV
C.H. Wise	SCALE 1"=50'		SHEET	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

Sandy Loam Backfill
 (No Rock over 2")
 11" Over Pipe
 Slope Sides to 10 ft.
 Beyond Sidewall & Endwall
 Compact to 90% Density

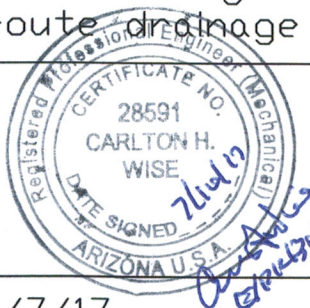
Geotextile
 Fabric



3" Dia.
 Dist. Pipe
 @ ground
 level

Cinder or
 Aggregate
 to 2" Over
 Dist. Pipe

Absorption Area: 5 sqft/linear ft.
 Trench spacing 5'
 Intersecting fill surfaces sloped to
 route drainage to ends of trench.



Cap System Trench Detail (Alt. Sys.)
 for: Mr. Borushko

APN: 106-79-046
 ACR N 1330 & 1332

7/7/17	SIZE A.	FSCM NO.	DWG NO.	REV
C.H. Wise	SCALE 1"=10"		SHEET	