AGEC
Applied GeoTech

January 3, 2019

Plumb Holdings SG, LLC
201 South Main, Suite 2000
Salt Lake City, Utah 84111

Attention: Walt Plumb
email: walter@gardnercompany.net

Subject: Onsite Wastewater Feasibility Study
Moccasin Flats Subdivision - 19 Lot Subdivision
Hurricane, Utah
AGEC Project Number: 2181805

Applied Geotechnical Engineering Consultants, Inc. (AGEC) was requested to conduct percolation testing and log subsurface soil/groundwater information for the proposed Moccasin Flats subdivision in Hurricane, Utah as shown on Figure 1. This information will be used to evaluate the feasibility of onsite wastewater systems for the proposed development.

SITE CONDITIONS

The proposed subdivision will consist of 19 lots and is located in Hurricane, Utah as shown on Figure 1. The topography of the subject site consists of mild to steep slopes sloping downwards from east to west. The existing site slopes are mild near the west property boundary along 1100 West Street and become steeper to the east as the property nears the cliffs formed by the Hurricane Fault. The site generally slopes down towards the west at approximately 8 to 10 percent with much steeper slopes where the site boundary encounters the cliffs at the south end.

Multiple shallow drainage paths run down the slopes from east to west. The site contains native vegetation consisting of sparse low brush and dry grass. The project site is bounded on the north by the Cliff Dwellers subdivision, to the east and south by undeveloped land and to the west by 1100 West Street.

The site plan showing the lot boundaries, lot numbers, and test pit locations, is shown on Figure 2. A drainage plan should be provided by a registered Civil Engineer.

PROPOSED CONSTRUCTION

We understand it is proposed to subdivide the property into 19 lots proposed for residential construction. The 19 lots will be subdivided into three 14-acre lots (lots 1-3), fourteen 10-acre lots (lots 4-17), and two 21-acre lots (lots 18-19) as shown on Figure 2. The proposed residences constructed on each lot will be serviced with individual onsite wastewater systems.

WATER SOURCES / FLOOD PLAIN

According to the Utah Division of Water Rights website, the site contains 8 underground water wells within 1,500 feet of the site (see Figure 3). Of the 8 well sites, 3 were drilled after 1992 and are therefore included in the permit database and are summarized in Table 1 below. Additional records for the other 5 older wells can be accessed at http://maps.waterrights.utah.gov. Based on the interactive map provided on the Utah Division of Water Rights website, only one of the wells is located on the site, with the other 7 wells located on adjacent land to north and west as shown on Figure 3.

Table 1: Well Information

Well ID#	Well Depth (ft)	Diameter (in)	Location
9455	548	10	N 754 W 260 SE 28 42S 13W SL
437901	200	1¼	S 733 W 103 NE 33 42S 13W SL
8174	503	14	S 629 W 693 NE 33 42S 13W SL

The site is not mapped within a flood plain area as designated on the Washington County interactive map utilizing the FEMA Flood Hazard layer. The nearest flood hazard area is approximately 2.5 miles northeast of the site. The FEMA Flood Hazard map is available in the interactive map found on the Washington County Recorder website (http://geo.washco.utah.gov).

A site specific drainage study should be completed by a Civil Engineer to verify flood information and to provide a drainage detail for draining surface water onto and off of the site.

SUBSURFACE CONDITIONS

On October 15 and 16, 2018, a total of 19 test pits were excavated with a mini-excavator. The test pits were excavated to a minimum depth of 10 feet, except for test pit TP-19 where excavator refusal was encountered on large boulders at 7 feet below grade. The results of our field study indicate the subsurface conditions at the site generally consists of sandy loam with various amounts of gravel to the maximum depth investigated approximately 10 feet. Test pit logs for the corresponding percolation test results are attached on the percolation certificates.

Groundwater was not encountered in the 19 excavated test pits to the maximum depth investigated, approximately 10½ feet.

The percolation rates measured at the 19 test pit locations ranged from 2 to 5 minutes per inch. The percolation rates for each test pit are summarized in the Table 2 below and are included on the percolation certificates attached in the Appendix. Photographs of the test pits are also included in the Appendix.

Table 2: Summary of Percolation Testing

Test Pit	Percolation Rate (min/in)	Test Pit Depth (ft)	Soil Type
TP-1	2	10	Sandy Loam with 10-20% gravel
TP-2	3	10	Sandy Loam with 40-50% gravel
TP-3	2	10	Sandy Loam with 40-50% gravel
TP-4	3	10½	Sandy Loam with 40-50% gravel
TP-5	5	10	Sandy Loam with 30-40% gravel
TP-6	5	10	Sandy Loam with 30-40% gravel
TP-7	5	10	Sandy Loam with 30-40% gravel
TP-8	5	10	Sandy Loam with 40-50% gravel
TP-9	3	10	Sandy Loam with 20-30% gravel
TP-10	2	10	Sandy Loam with 20-30% gravel
TP-11	2	10	Sandy Loam
TP-12	2	10	Sandy Loam with 20-30% gravel
TP-13	3	10	Sandy Loam with 30-40% gravel
TP-14	2	10	Sandy Loam with 20-30% gravel
TP-15	2	10	Sandy Loam with 30-40% gravel
TP-16	2	10	Sandy Loam with 20-30% gravel
TP-17	2	10	Sandy Loam with 10-20% gravel
TP-18	2	10	Sandy Loam with 10-20% gravel
TP-19	5	7	Sandy Loam with 10-20% gravel

CONCLUSIONS

Based on the percolation test results and the soil types observed within the 19 test pits, the subsurface conditions meet the department of Environmental Quality regulations and fall within the guidelines of the Utah Administrative Code R317-4. All 19 percolation test locations meet the requirements for the design of conventional onsite wastewater systems. These conventional systems may vary between deep wall and shallow trench systems based on the depths and types of soils encountered.

Due to the relatively large size of the proposed lots and variation of subsurface conditions/ percolation rates across the site, we recommend future test pit observations and percolation testing be conducted as recommended by the Southwest County Health Department for design of future onsite wastewater systems. Future test pit observations and percolation tests should be conducted near the site of the proposed onsite wastewater system. The attached percolation test results should be valid for systems constructed near the approximate locations shown on Figure 2.

LIMITATIONS

This report is prepared in accordance with generally accepted soil engineering practices in the area for the use of the client for design purposes. The conclusions and recommendations included within the report are based on the information obtained from the test pits excavated, observation of subsurface conditions, and percolation rates measured at the approximate locations indicated on the attached site plan. If the soil or groundwater conditions are found to be different from those described in the report, we should be notified to reevaluate the recommendations given.

If you have any questions or if we can be of further assistance please call.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

Jake Erickson, P.E., Certification No. 02735-OSP-2

Reviewed By: Arnold DeCastro, P.E., Certification No. 00173-0SP-2

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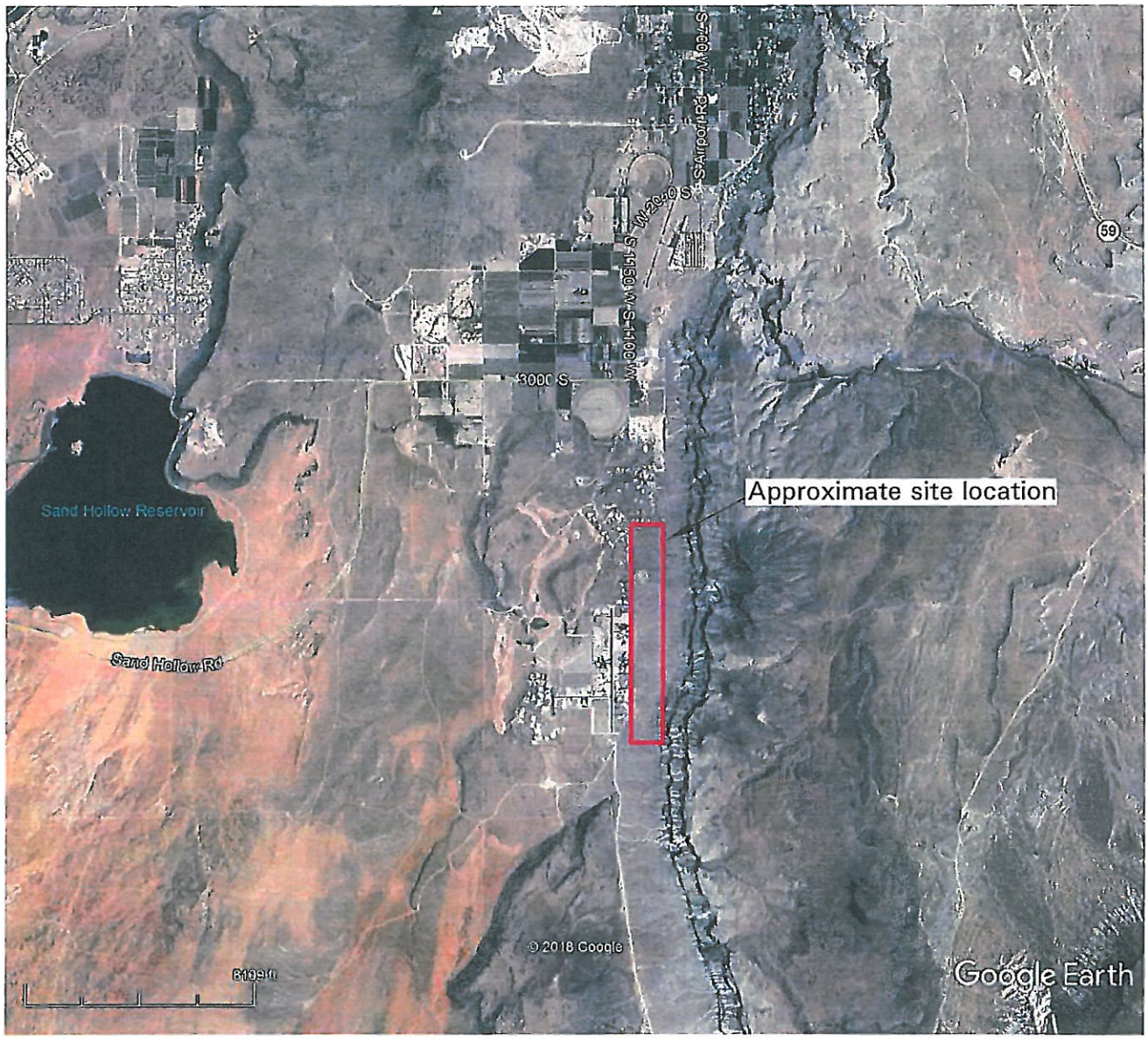


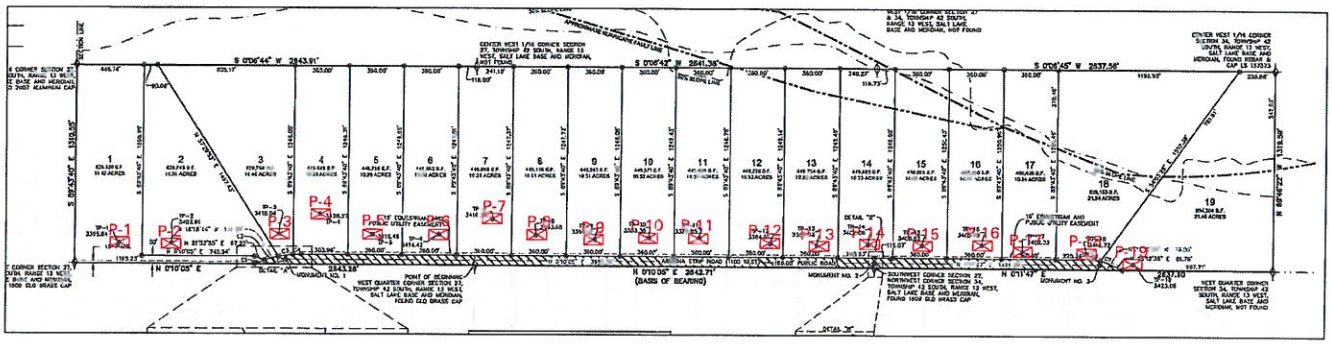
MOCCASIN FLATS SUBDIVISION
HURRICANE, UTAH

N

Not to Scale

2181805	AGEC	Vicinity Map	Figure 1

MOCCASIN FLATS SUBDIVISION
HURRICANE, UTAH



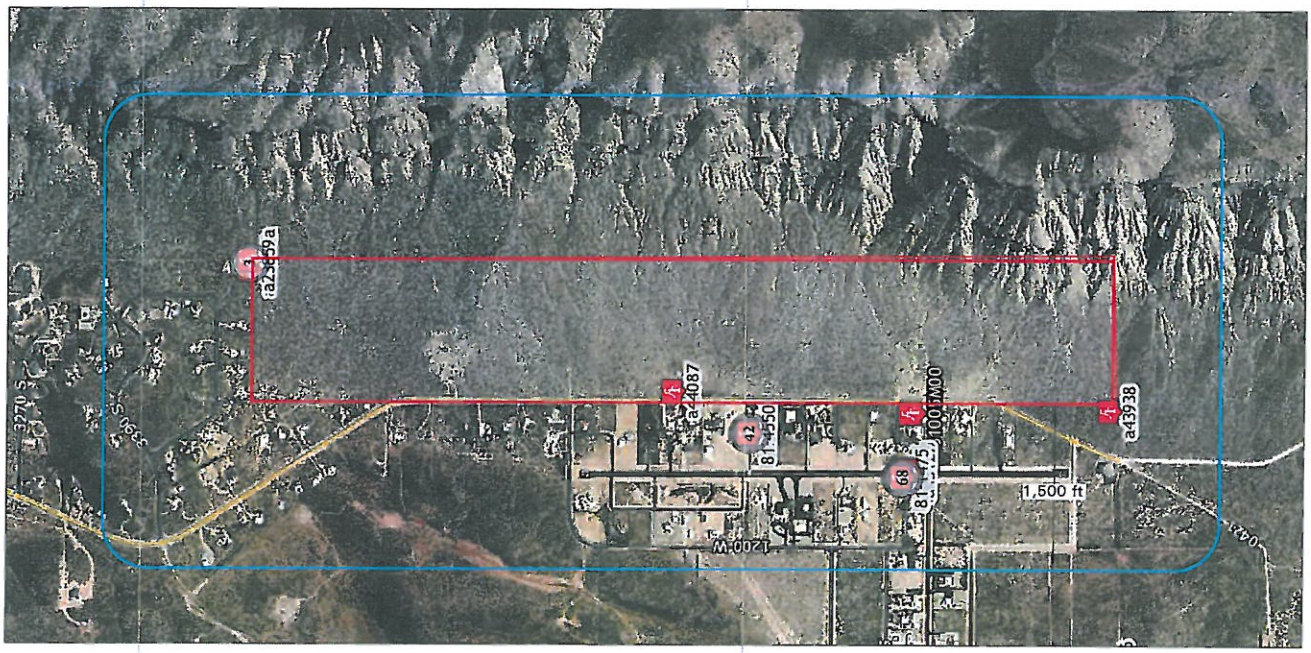
N

Approximate percolation test location

0 600 1,200 feet
Approximate Scale

2181805	AGEC	Site Plan	Figure 2

MOCCASIN FLATS SUBDIVISION
HURRICANE, UTAH



N

0 800 1,600 feet

Approximate Scale

2181805	AGEC	Water Well Locations	Figure 3

APPENDIX

Photo 1: Test Pit TP-1

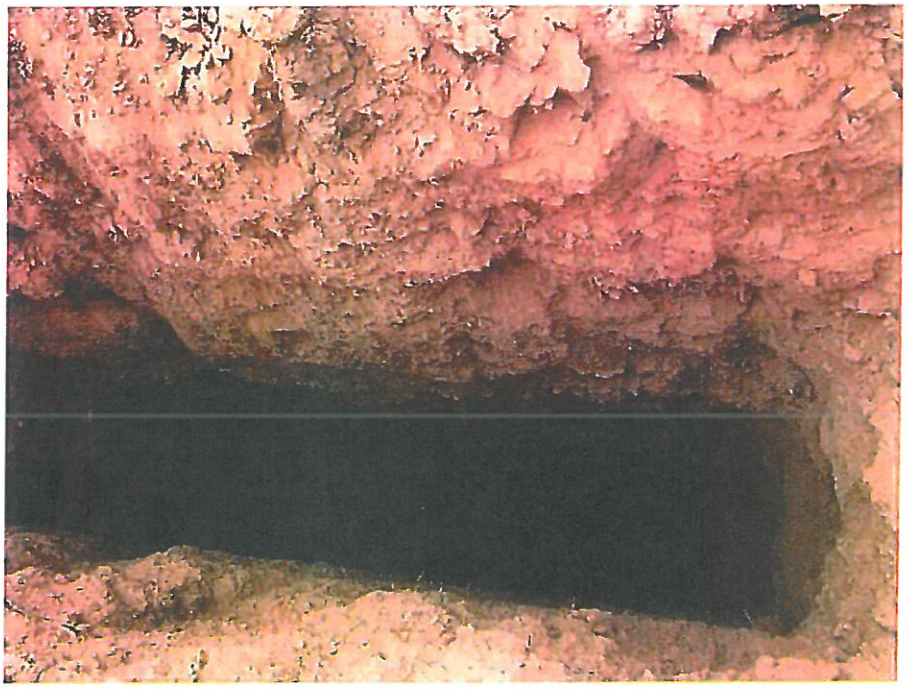


Photo 2: Test Pit TP-2

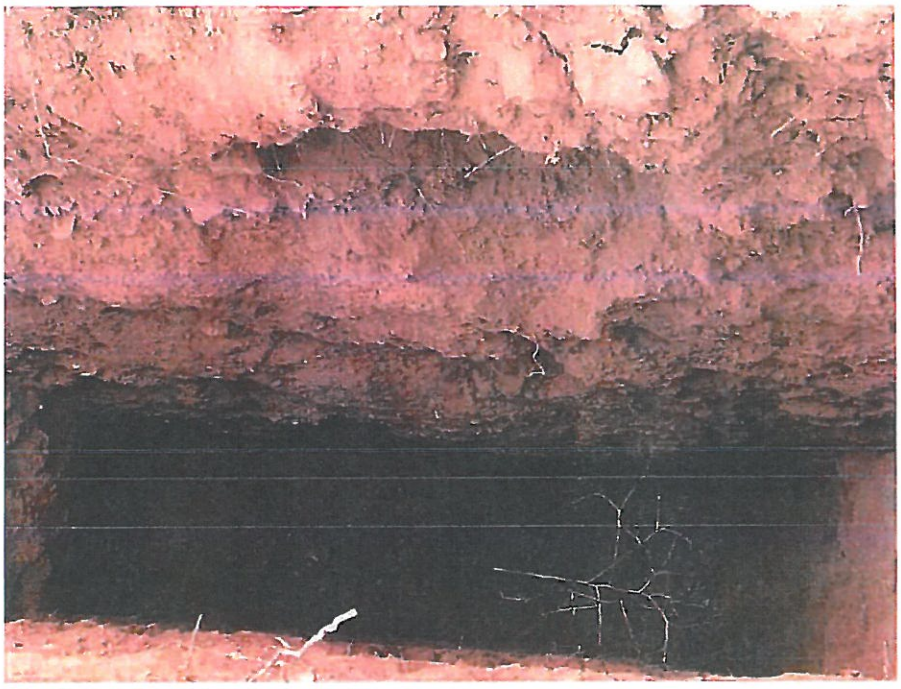


Photo 3: Test Pit TP-3

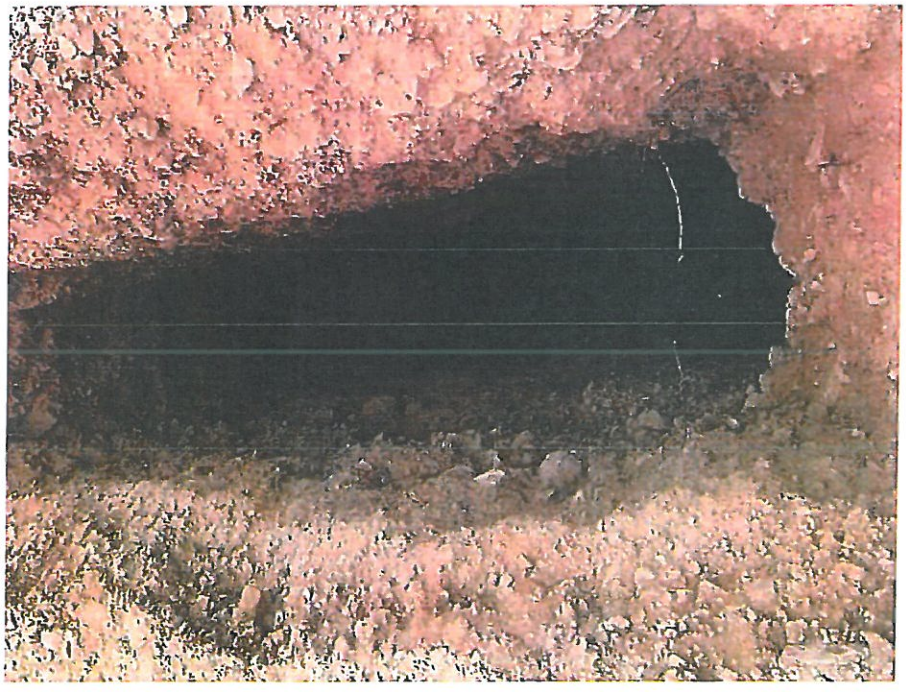


Photo 4: Test Pit TP-4

Photo 5: Test Pit TP-5

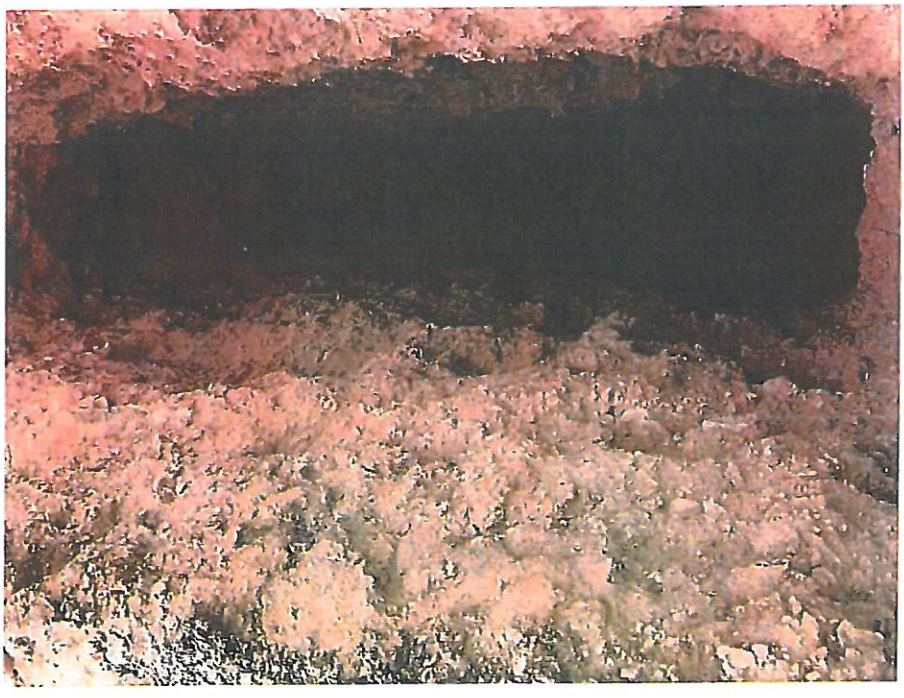
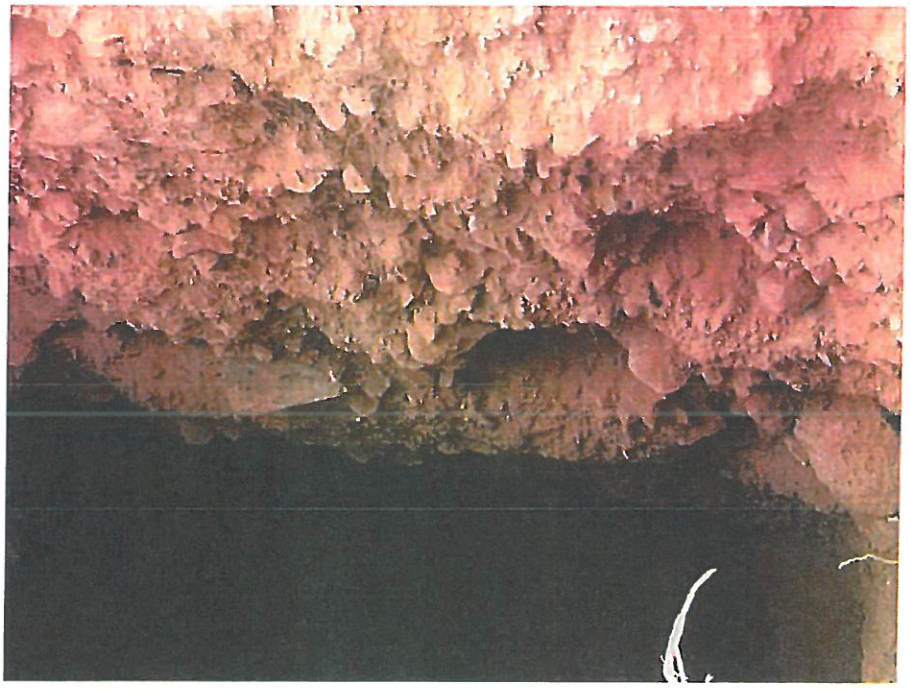


Photo 6: Test Pit TP-6

Photo 7: Test Pit TP-7



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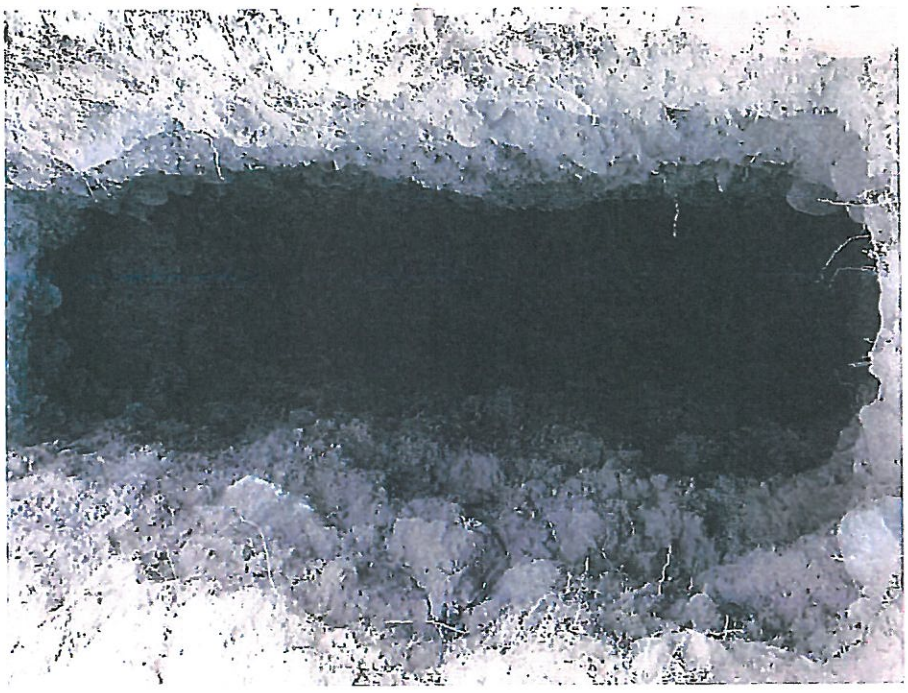


Photo 9: Test Pit TP-9

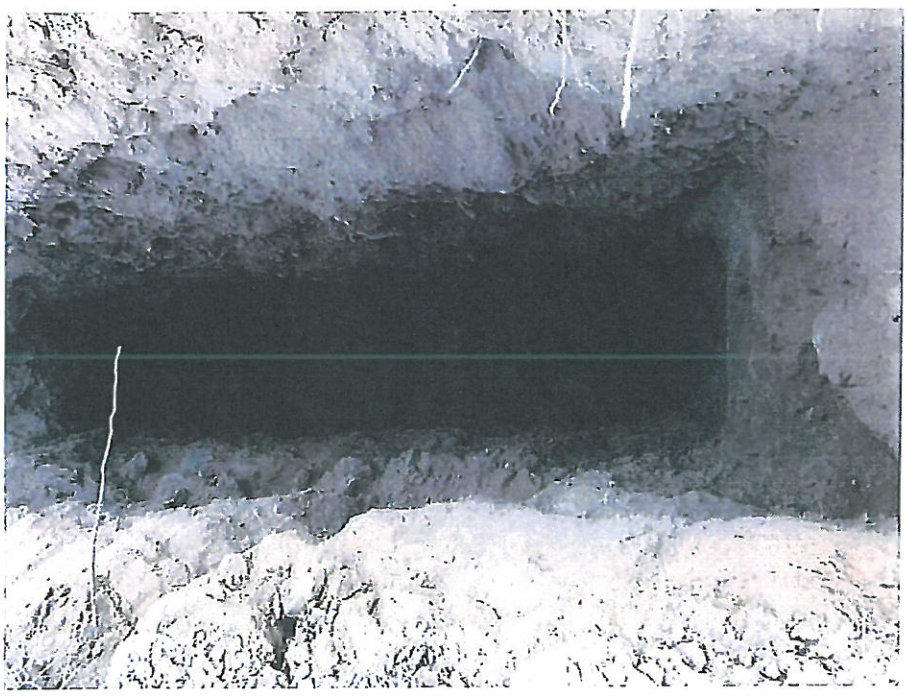


Photo 10: Test Pit TP-10

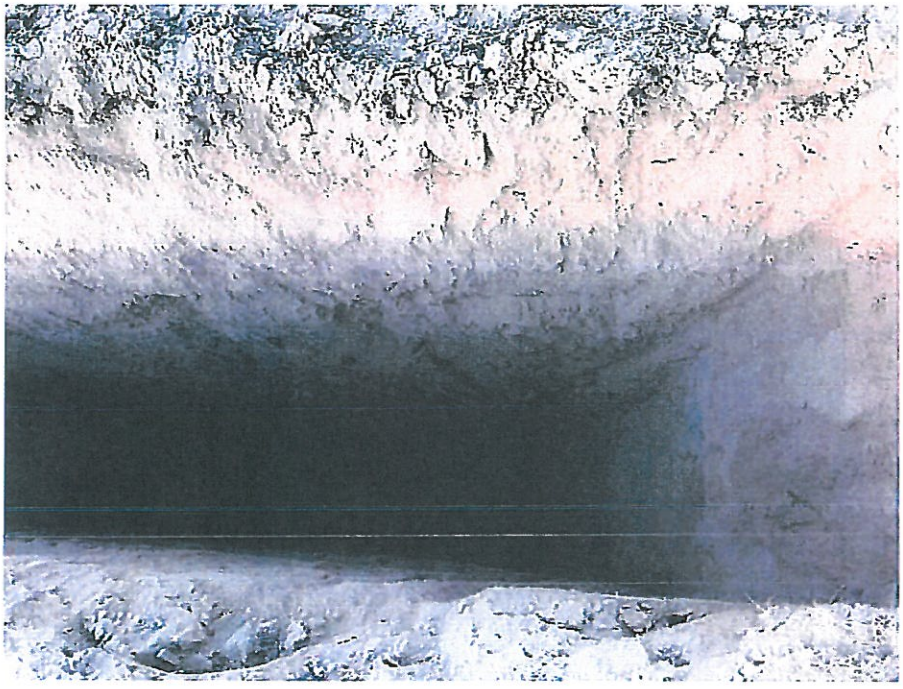
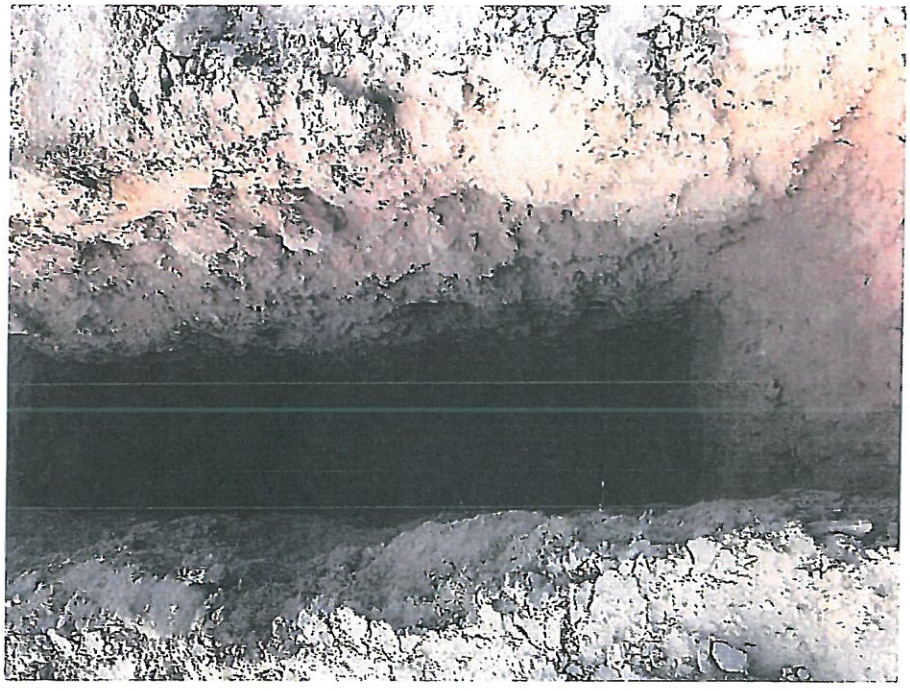


Photo 11: Test Pit TP-11



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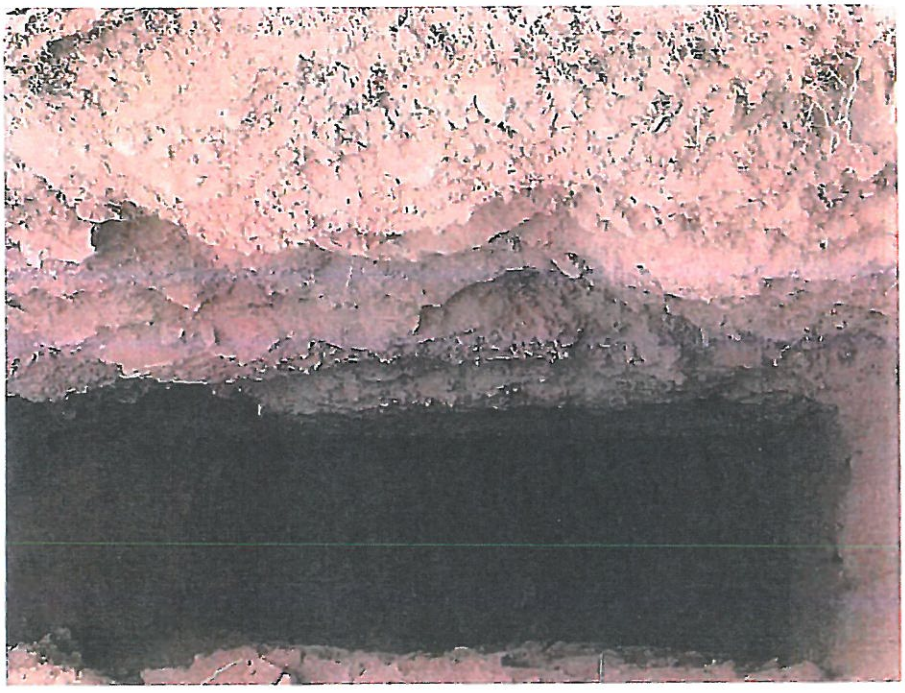

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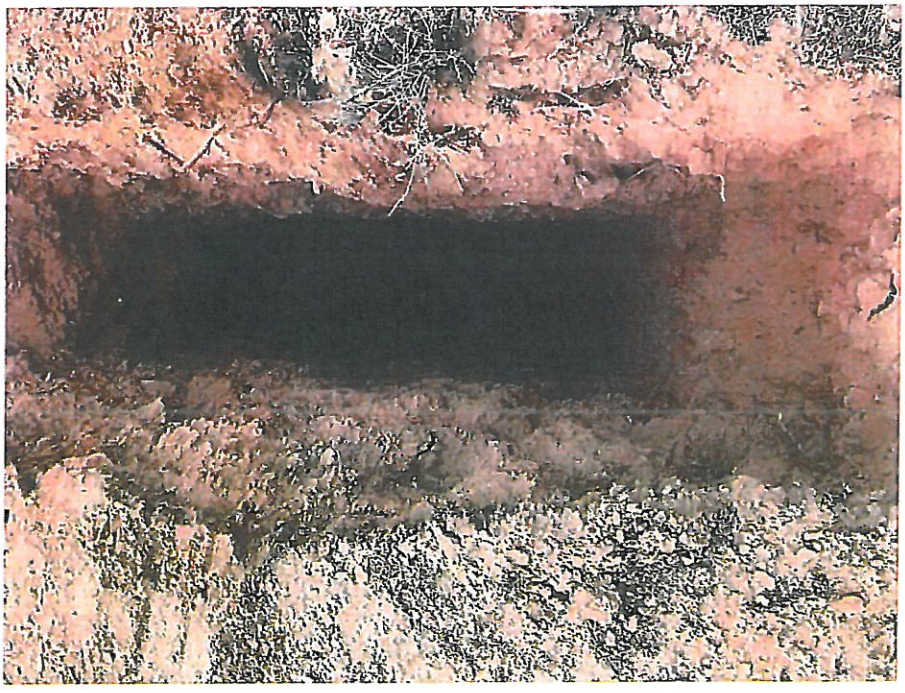

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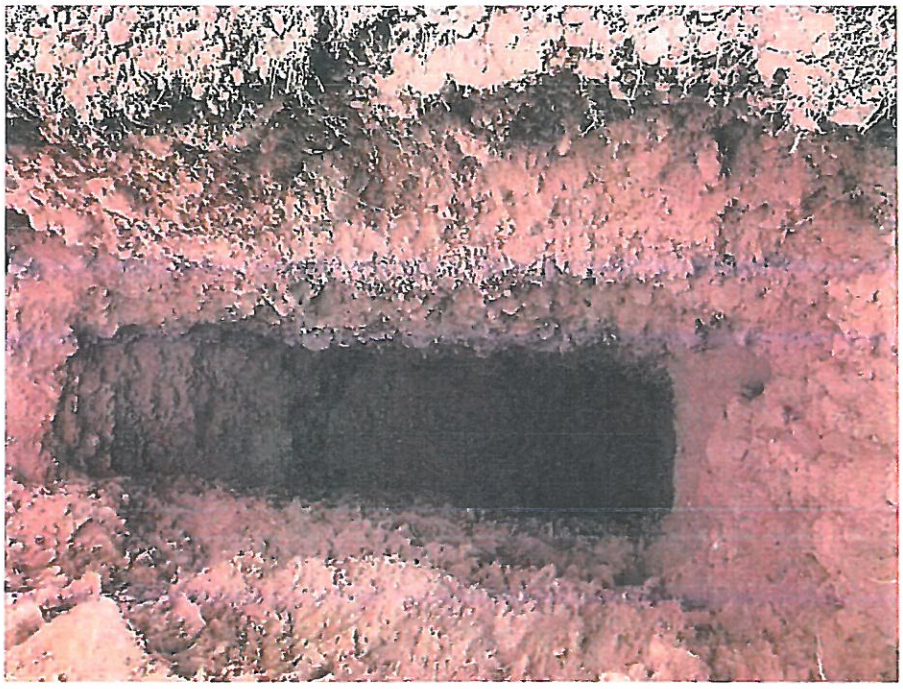

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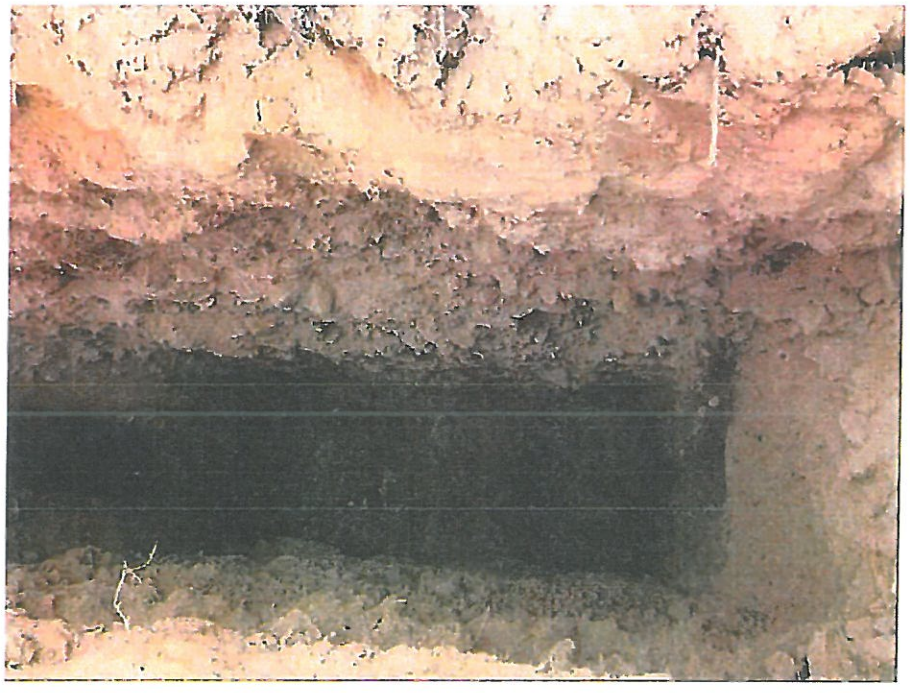

Photo 16: Test Pit TP-16

Photo 17: Test Pit TP-17

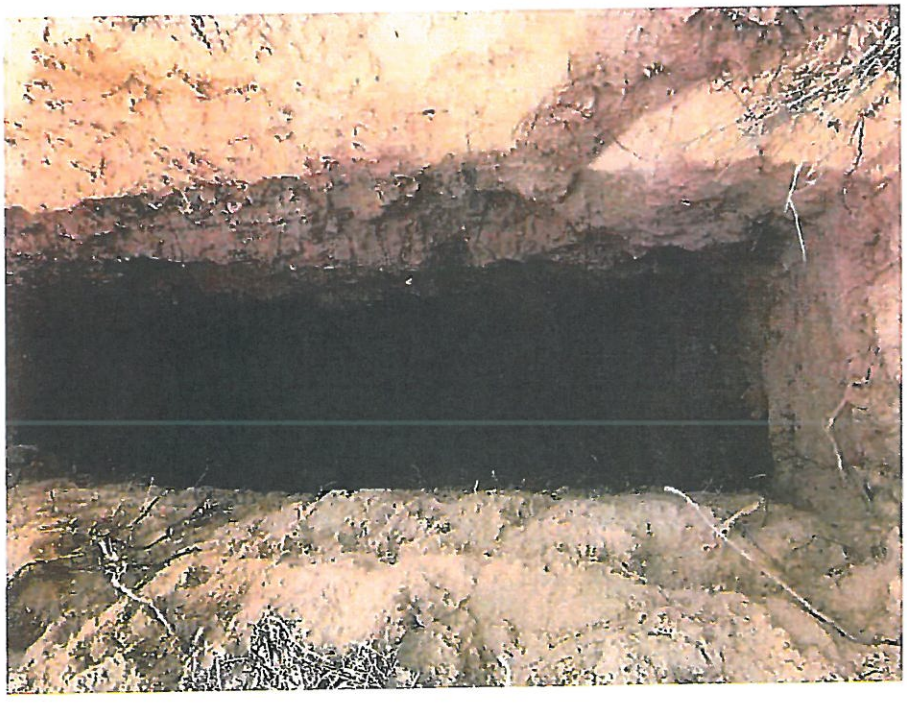

Photo 18: Test Pit TP-18

Photo 19: Test Pit TP-19