



Drainage Reports

Abbreviated Water and Sewer Needs

Water Study

Wastewater Study

Stormwater Waiver Application

Larson Engineering, Inc.
6380 E. Thomas Road, Suite 300
Scottsdale, AZ 85251
480.212.4200
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Sewer Basis of Design Report

For

Scottsdale Storage

CASE#: 965-PA-2018

22001 N Scottsdale Road
Scottsdale, AZ 85255

Scottsdale, ARIZONA

PREPARED FOR:

RKAA Architects, Inc.
2233 E. Thomas Rd.
Phoenix, Arizona 85016

PREPARED BY:

Larson Engineering, Inc.
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August 2019



Larson



FINAL Basis of Design Report

- APPROVED
- APPROVED AS NOTED
- REVISE AND RESUBMIT



Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance. For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

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DATE 11/19/2019

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Appendix:

Sewer Exhibit

Calculations



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Introduction

The proposed Scottsdale Storage (The Project) is located at 22001 N. Scottsdale Road in Scottsdale Road. The parcel numbers for this project is 212-02-967B and 212-02-968. The Project consists of adding a four story storage facility, curbing, refuse container, utilities, underground retention, a drywell and landscaping. The building is a floor layout of 24,340 square feet in size with four floors of varying floor layouts. The total square footage of the building is 97,595 square feet. The Project is located at the northeast corner of the intersection of Scottsdale Road at Monogram Drive. See Location Map below:



The Project will not alter the existing zoning, which is C-3. The surrounding area at This location is commercial businesses and consists of commercial services and offices along with undeveloped land to the west. The existing site is undeveloped land. The new building will remain consistent with the City of Scottsdale's general plan. There is an existing was to the immediate west and south of this proposed building. The project will not disturb the wash or drainage easement area.

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Design Documentation

Wastewater Design Flows are based on criteria provided in the City of Scottsdale's Design Standards & Policies Manual Chapter 7 dated 2018. This criteria was compared to the information provided in Chapter 9 Title 18 of the Arizona Administrative Code and was more conservative, thus satisfying both codes. Specifically, the design criteria used are as follows:

- Average Daily Flow 0.5 Gallons/SF/Day
- Peaking Factor (peak hour) 3
- Minimum Full Flow Velocity 2.5 ft/s
- Maximum Full Flow Velocity 10 ft/s
- Manning's Coefficient (n): 0.013

Wastewater Calculations are attached in the Appendix for reference. The Manning Equation was utilized to analyze the proposed system.

Existing Conditions

The Project will not alter the existing zoning, which is C-3. The existing site is currently undeveloped land with a drainage wash to the west and south of the proposed building. The area to the north of the Project is a car wash, to the east is a business center, to the south is Monogram Road and the west is Scottsdale Road.

Proposed Conditions

The attached Wastewater Exhibit shows the tie in location for the proposed sewer. This Project proposes to use 6-inch SDR35 PVC pipe. The tie in is seen in the Utility Plan. All maintenance of the private onsite system is the responsibility of the owner.

Computations

The proposed wastewater collection system is designed to provide adequate capacity to serve the proposed Project. The proposed pipe is SDR35 PVC at 6 inch diameter. The slope is proposed 0.5% and the depth of cover of the pipe will be a minimum of 36" to top of pipe.

Summary

The Proposed Wastewater Distribution System has been analyzed to ensure all City of Scottsdale Design Standards and Policies Manual Chapter 7 requirements are being met. Figure 7.1-2 of that manual provided the demand and peaking factors included in the analysis and stated in this report.

Enclosed is a set of drawings and spreadsheets which summarize the design and capacity of the system.

Thank you for your prompt review of the proposed wastewater collection system.

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Scottsdale Storage

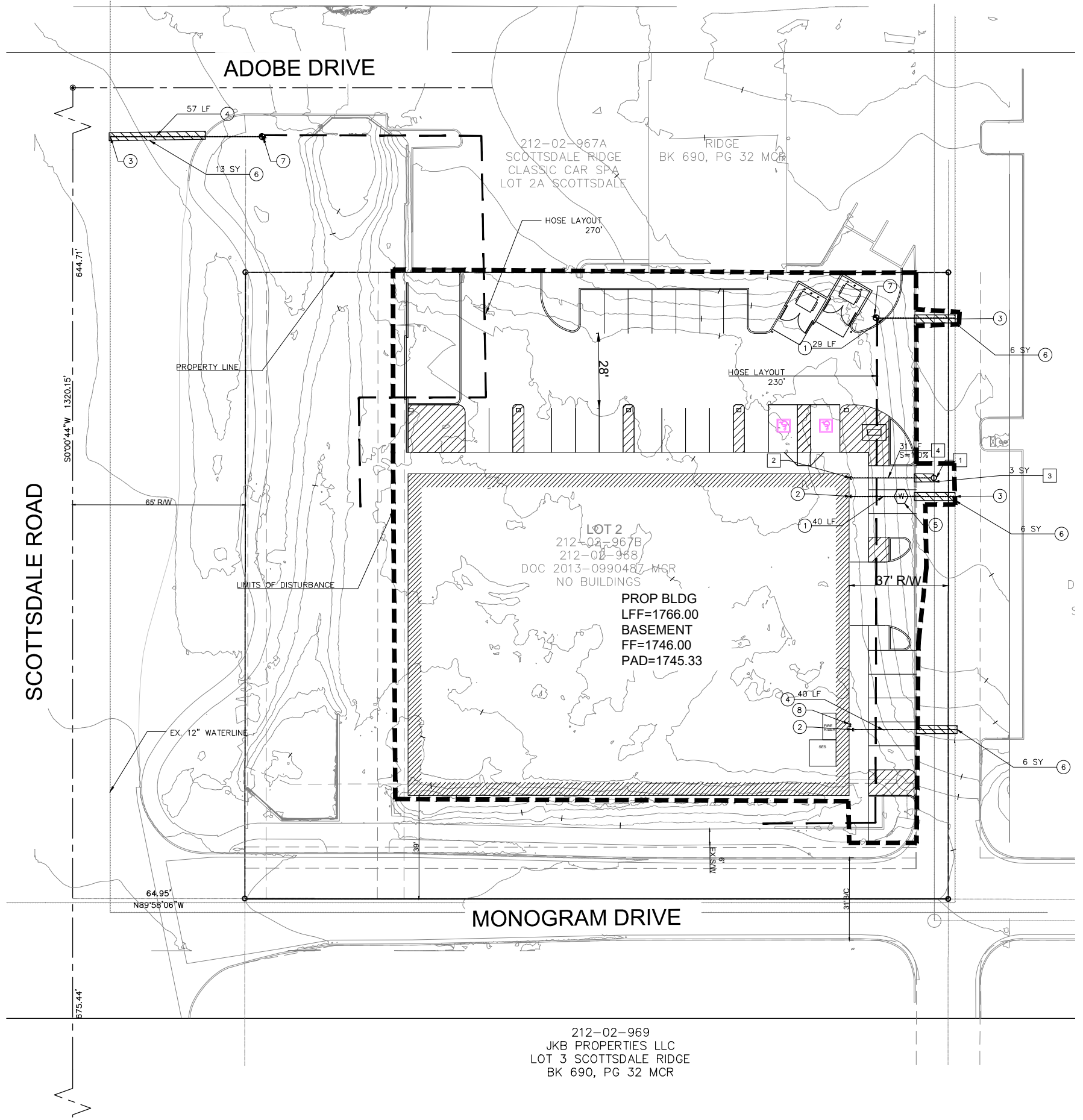
Wastewater Flows

Description	Use	Bldg Sqft	Demand ADF (Gal/SF/Day)	Avg. Daily Flow (GPD)	Peak Factor	Peak Flow (GPD)	Peak Daily Flow (GPM)
Storage Bldg	Office	1,441	0.5	721	3	2,162	1.50

Demand and Peak Factors based on City of Scottsdale's Design Standards & Policies Manual Chapter 7 Dated January 2010 only the office has sewer

Scottsdale Storage

Pipe Diameter (in)	Pipe Length (FT)	Pipe Slope(%)	Peak Daily Flow (gpm)	Max Capacity (GPM)	Velocity (ft/sec)
6	60	0.5%	1.50	252.4	2.9



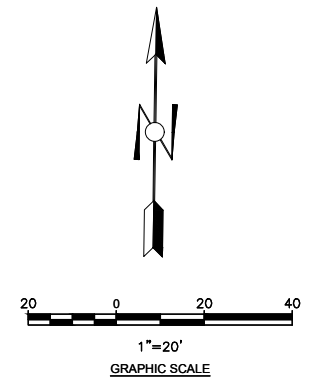
WATER CONSTRUCTION NOTES		QUANTITIES
1	INSTALL 1" TYPE K COPPER PIPE OR EQUIVALENT PER COS STD DTL 2201. MAINTAIN MINIMUM 36" OF COVER.	40 L.F.
2	CONNECT TO BUILDING, SEE PLUMBING PLANS	1 EA
3	CONNECT TO EXISTING 12" CIP WATERLINE WITH TAPPING SLEEVE AND VALVE PER COS STD DTL 2362-2.	1 EA
4	INSTALL 6" D.I.P. FIRELINE	126 LF
5	INSTALL 1" WATER METER	1 EA
6	PAVEMENT REPLACEMENT PER COS STD. DTL. 2200	34 SY
7	NEW FIRE HYDRANT PER MAG STD DTL 360-3	2 EA
8	SIAMESE FDC ON BUILDING, SEE ARCHITECTURAL AND PLUMBING PLANS	1 EA

SEWER CONSTRUCTION NOTES		QUANTITIES
1	INSTALL SEWER CLEANOUT AT EXISTING SEWER LOCATION	1 EA
2	CONNECT TO BUILDING SEWER SERVICE PER MAG STD. DTL 440-1	1 EA
3	PAVEMENT REPLACEMENT PER COS STD. DTL. 2200	2.5 SY
4	INSTALL 6" SDR-35 PVC PIPE PER COS STD DTL 2201. SEE PLUMBING PLANS FOR CONTINUATION	31 LF

NOTE:
CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES AND TYPE OF MATERIAL BEFORE PROCEEDING WITH TRENCHING

LEGEND

	LIGHT DUTY CONCRETE
	LANDSCAPE AREA
	TRASH ROUTE
	EXISTING STORM DRAIN
	EXISTING WATERLINE
	EXISTING GAS LINE
	EXISTING OVERHEAD ELECTRIC
	EXISTING SANITARY SEWER
	EXISTING WATER METER
	EXISTING POWER POLE
	EXISTING STREET SIGN
	PROPOSED BUILDING OUTLINE
	CONCRETE BOLLARD
	DRIVEWAY CURB ENTRANCE
	LOADING ZONE



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CLIENT
1784 Capital Holdings

PROJECT DESCRIPTION
PROPOSED INTERNALIZED COMMUNITY STORAGE

SCOTTSDALE
 ARIZONA

ISSUE DATES

**PRELIMINARY
 NOT FOR
 CONSTRUCTION**

SD	SCHEMATIC DESIGN	05-20-19
MARK	DESCRIPTION	DATE

PROJECT NO: 20192780
 DRAWN BY: MAB
 CHECKED BY: MAB

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DRAWING TITLE
UTILITY PLAN



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Appendix:

Utility Plan

Calculations

Hydrant Flow Test



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Introduction

The proposed Scottsdale Storage (The Project) is located at 22001 North Scottsdale Road in Scottsdale. The parcel number for this project is 212-02-967B and 212-02-968. The Project consists of adding a building, curbing, refuse container, utilities, and landscaping. The building is 97,500 square feet in size. This project is for personal storage and the water is only provided to the office portion of the building which is 1,400 square feet in size. The Project is located at the Northeast corner of the intersection of Monogram Road at Scottsdale Drive. See Location Map below:



The Project will not alter the existing zoning, which is C-3. The surrounding area at This location is commercial businesses and consists of commercial services and offices along with undeveloped land to the west. The existing site is undeveloped land. The new building will remain consistent with the City of Scottsdale's general plan. There is an existing was to the immediate west and south of this proposed building. The project will not disturb the wash or drainage

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easement area.

Design Documentation

Water Design Flows are based on criteria provided in the City of Scottsdale's Design Standards & Policies Manual Chapter 6 dated 2018. Specifically, the criteria used are as follows:

Water Calculations are attached in the Appendix. Existing service line size, backflow preventer and building supply sizes will need to be verified and if needed upgraded and identified prior to final plan approval. The site proposes to install an FDC and a fire sprinkler line. See the attached Utility Plan in the Appendix for details.

Existing Conditions

The existing site is currently undeveloped land with a drainage wash to the west and south of the proposed building. The area to the north of the Project is a car wash, to the east is a business center, to the south is Monogram Road and the west is Scottsdale Road. .

The existing site is undeveloped land. The site does not contain an existing water service tap. The proposed building will tie into the existing 8" waterline in the road to the east of the site with a new water service. The site will be adding a water meter.

The fire line will utilize a 6-inch Ductile Iron Pipe for the fire sprinkler system.

Proposed Conditions

The attached Water Exhibit shows the tie in locations for the domestic water, and fire sprinkler system. This Project proposes to use 1 inch Copper pipe. All maintenance of the private onsite system is the responsibility of the owner.

Calculations

The proposed Water distribution system is designed to provide adequate capacity to serve the proposed Project.

Summary

The Proposed Water Distribution System has been analyzed to ensure all City of Scottsdale Design Standards and Policies Manual Chapter 6 requirements are being met. Figure 6.1-2 of that manual provided the water demand and peaking factors included in the analysis and stated in this report. The Appendix includes calculations of pressure loss, the hydrant flow test and a water exhibit showing proposed water and fire line.

The Project is expected to be completed in late 2020.

Enclosed is a set of drawings and spreadsheets which summarize the design and capacity of the system. The spreadsheets show the use, average daily flow rate and peak flow rates for the project. This project is proposed to start as soon as approval is obtained and completed within 6 months. Please refer to the attached Water exhibit for layout of the lines and connections.

Thank you for your prompt review of the proposed water collection system.



Flow Test Summary

Project Name: EJFT 19169
Project Address: 22001 N Scottsdale Rd, Scottsdale, AZ 85255
Date of Flow Test: 2019-08-01
Time of Flow Test: 7:00 AM
Data Reliable Until: 2020-02-01
Conducted By: Cesar Reyna & Austin Gourley (EJ Flow Tests) 602.999.7637
Witnessed By: Sonny Schreiner (City of Scottsdale) 602.819.7718
City Forces Contacted: City of Scottsdale (602.819.7718)
Permit Number: C59032

Note Scottsdale requires a max static pressure of 72 psi for safety factor

Raw Flow Test Data

Static Pressure: 102.0 PSI
Residual Pressure: 84.0 PSI
Flowing GPM: 2,545
GPM @ 20 PSI: 5,772

Data with a 30 PSI Safety Factor


Static Pressure: 72.0 PSI
Residual Pressure: 54.0 PSI
Flowing GPM: 2,545
GPM @ 20 PSI: 4,513

Hydrant F₁

Pitot Pressure (1): 55 PSI
Coefficient of Discharge (1): 0.9
Hydrant Orifice Diameter (1): 2.5 inches
Pitot Pressure (2): 60 PSI
Coefficient of Discharge (2): 0.9
Hydrant Orifice Diameter (2): 2.5 inches



 Project Site

 Static-Residual Hydrant

 Flow Hydrant

Main Size
8 inches

Distance Between F₁ and R
621 ft (measured linearly)

Static-Residual Elevation
1769 ft (above sea level)

Flow Hydrant (F₁) Elevation
1761 ft (above sea level)

Elevation & distance values are approximate

EJ Flow Tests, LLC

21505 North 78th Ave. | Suite 130 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejengineering.com
John L. Echeverri | NICET Level IV 078493 SME | C-16 FP Contractor ROC 271705 AZ | NFPA CFPS 1915
www.flowtestsummary.com

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Static-Residual Hydrant



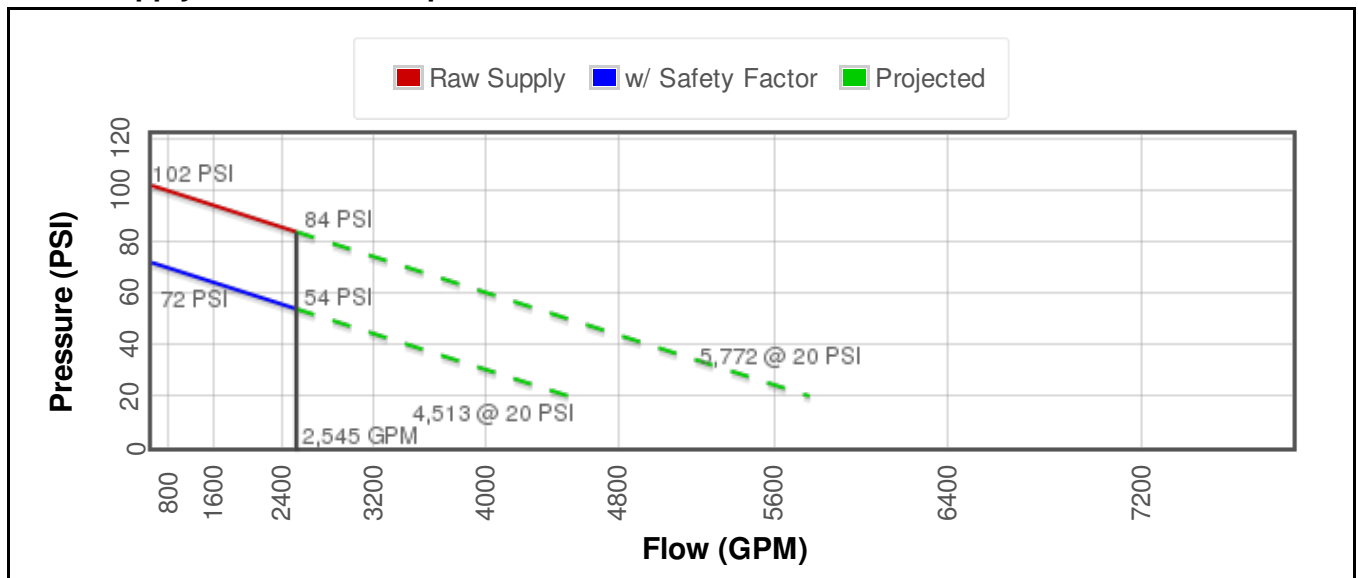
Flow Hydrant (only hydrant F1 shown for clarity)



Approximate Project Site



Water Supply Curve N^{1.85} Graph



Scottsdale Storage													
Water Calculations													
Bldg Sqft	Office Area (SF)	*Demand (GPD/SF) Interior (Office)	Demand Exterior (GPD/SF)	Demand Bldg + Exterior (GPD)	Demand Total GPM	Max Day Demand (GPM)	Peak Day Demand (GPM)	Residual Pressure (P.S.I.)	**1" Meter Loss	**Backflow Pressure Loss	Friction Loss (P.S.I.)	Total Pressure Loss (P.S.I.)	Peak Hour (P.S.I.)
97,500	1,400	0.5	0.1	10,450	7.3	14.5	21.8	54	0.1000	4	4.7	8.8	45.2

*Based on City of Scottsdale Design and Engineering Manual Chapter 6

Scottsdale Storage						
Water + Fire Flow						
Bldg Sqft	Max Day Demand (GPM)	*Fire Flow Requirement (GPM)	Max Day Demand + Fire Flow Requirement (GPM)	Peak Day Demand (GPM)	Peak Day + Fire Flow Demand (GPM)	Hydrant Flow Test Results (GPM)
97,500	14.5	1,625	1,639.5	21.8	1,646.8	2,545

*Per IFC 2015 Table B105.1 (2)

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Drainage Report

Scottsdale Storage

CASE#: 965-PA-2018

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August 2019



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Grading Plan

Calculations

FEMA FIRM

City of Scottsdale Design Criteria

City of Scottsdale Isopluvial Map

Underground Storage Durability/Life Cycle Guide

Underground Storage Operations Manual

LOMR Approval Letter



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Introduction

The proposed Scottsdale Storage (The Project) is located at 22001 N. Scottsdale Road in Scottsdale Road. The parcel numbers for this project is 212-02-967B and 212-02-968. The Project consists of adding a four story storage facility, curbing, refuse container, utilities, underground retention, a drywell and landscaping. The building is a floor layout of 24,340 square feet in size with four floors of varying floor layouts. The total square footage of the building is 97,595 square feet. The Project is located at the northeast corner of the intersection of Scottsdale Road at Monogram Drive. See Location Map below:



Figure 1 Location Map

The Project will not alter the existing zoning, which is C-3. The surrounding area at This location is commercial businesses and consists of commercial services and offices along with undeveloped land to the west. The existing site is undeveloped land. The new building will remain consistent with the City of Scottsdale's general plan. There is an existing was to the immediate west and south of this proposed building. The project will not disturb the wash or drainage easement area.

Design Documentation

Drainage Design Flows are based on criteria provided in the City of Scottsdale's Design Standards & Policies Manual Chapter 4 dated 2018 and the Flood Control District of Maricopa County Volume I & II. Specifically, the criteria used are as follows:

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This project will utilize the existing topography to convey stormwater runoff to an underground storage tank proposed on the property. The proposed condition will capture all required runoff for the 100 year 2 hour storm. The elevations for this design are based on the survey performed by Synergy Surveying LLC., performed on January 15, 2019. The benchmark used Name 2222 and is GLO brass cap, 1919, in hand hole @ Deer Valley Road and Scottsdale Road (down 0.45') at NAVD 88 EL = 1747.03.

Existing Conditions

The Project will not alter the existing zoning, which is C-3. The existing site is currently undeveloped land with a drainage wash to the west and south of the proposed building. The area to the north of the Project is a car wash, to the east is a business center, to the south is Monogram Road and the west is Scottsdale Road.

Currently, the site has a Drainage Wash that runs south from the north and east. There is a floodzone located here, zone AO. The building will be located adjacent to the wash in flood zone X. The proposed condition will not disturb the existing wash as the building is located outside of the wash. No improvements are proposed inside the wash. There is an approved Letter of Map Revision (LOMR) that covers this property. The LOMR Case number is 17-09-0074P and the effective date is August 25, 2017, this approval is provided in the Appendix. See FEMA FIRM map in Appendix.

FEMA Information

According to the FEMA Flood Insurance Rate Map (FIRM), panel number 04013C1320L. Dated October 16, 2013 part of the project site, including the building, is within a Zone "X". A Zone "X" is described as follows. The Approved LOMR letter also confirms the following:

"Areas of 0.2% annual chance of flood; areas of 1% annual chance of flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood."

A portion of the property, that will remain undisturbed is in a Zone AO with a depth of 1 foot and velocity of 3 feet per second. See FEMA FIRM in Appendix.

Offsite Flows

The Project is not affected by offsite flows. There is an existing wash on the south and the west of this Project. The building will be outside of this wash and the finish floor set above the high water elevation. The existing wash has a varying high water elevation with the maximum height adjacent to the building of 1761.36 on the northwest corner of the building, see Grading Plan in the Appendix. The maximum flow adjacent to the building is 37.23 cfs. The remainder of this project is protected from offsite flows by vertical curbing as well as grade break points to keep offsite flows off the property and onsite flows directed to the underground storage. The building is located outside of the wash and will not disturb the wash.

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This project will fully retain the 100 year 2 hours storm event. All onsite flows are directed to the proposed underground storage tank that will infiltrate runoff via a Maxwell Plus two chamber drywell. Since the site is fully retaining all runoff there will be no impact to the existing washes or to offsite flows by this Project.

Proposed Conditions

The proposed condition includes a 2 basement and 2 story high storage facility, curbing, refuse container, utilities, underground retention, drywell and landscaping. The site is proposed to have slopes of around 0.5-7%. Stormwater will be conveyed away from the building into the underground retention. Runoff is conveyed via overland flow and via pipes directly into the underground storage tank.

The building finish floor has been designed to be protected during the 100 year peak runoff event. The building finish floor is set at 3.6' above the site outfall. The site outfall can be seen on the attached Grading Plan. The finish floor elevation of 1766 is also 4.6 feet higher than the highest 100 year water surface elevation adjacent to the building in the wash. This 4.6 feet provides plenty of freeboard to protect the building from flooding. Since the 100 year 2 hour storm event is fully captured and retained onsite there will be no impact on the washes.

The proposed retention basin will include a drywell to ensure drainage within 36 hours. This drywell will drain the basin by gravity. The drywell will be governed by the City of Scottsdale Design Standards and Policy Manual and the FCD of Maricopa County Hydraulic Manual. The drywell must be permitted through ADEQ. The maintenance of the dry well will be the sole responsibility of the property owner. The underground tank will drain within 36 hours, calculations are included in the Appendix.

The proposed underground storage tank has a life cycle that exceeds 75 years including the lining and coating. The attached CSP Durability Guide has been included in the Appendix as verification. The Operations and maintenance Manual for the underground storage is also included in the Appendix. This will be followed by the property owner.

The underground Storage Tank will also include signs on each end of the underground storage tank indicating the tank location and depth.

Calculations

The Project has been designed to provide positive drainage away from the building. The project will convey runoff into 10 foot diameter underground retention tank. The grading plan shows the proposed retention and volume provided. The appendix includes the calculations for the required retention and the provided retention. The basin includes a drywell to percolate water within 36 hours of a storm event.

The proposed site is broken down by open space and a weighted C value is calculated and included. Utilizing the City of Scottsdale's Design Standards & Policies Manual Chapter 4 Figure 4.1-4 yields the C value utilized for the calculations. The Depth of precipitation was gathered from the City's Isopluvial Map in the Design Standards & Policies Manual Appendix 4-1D, which has been included in the appendix of this report.

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Fire Hydrants

The proposed project intends to add 2 fire hydrants. One is located northwest of this project right near an entrance to allow easy fire department connection if the truck enters from this location. The other fire hydrant is located on the east side of the property to provide full coverage of the hose layout. The attached Grading Plan shows the hose layout and the proposed fire hydrants are in compliance with the City Code.

The Fire Department Connection is proposed to be located on the building at the Fire Riser Room. This is also called out on the attached Grading Plan. The fire truck turning radius and bucket swing is also shown and identified on the attached Grading Plan.

The turning radius at the loading zone meets the City requirements. The Grading Plan indicates the radius as well as the bucket swing.

Summary

Based on the results of the Project Drainage design, the following can be concluded:

- The Project building resides in a FEMA Designated Zone X per the FIRM panel number 04013C1320L Dated October 16, 2013 and part of the property is resides in a FEMA Zone AO with no proposed disturbance to this area
- The 100 year 2 hour storm event retention has been provided for the developed condition via underground storage and a drywell to empty the tank

GRADING PLAN

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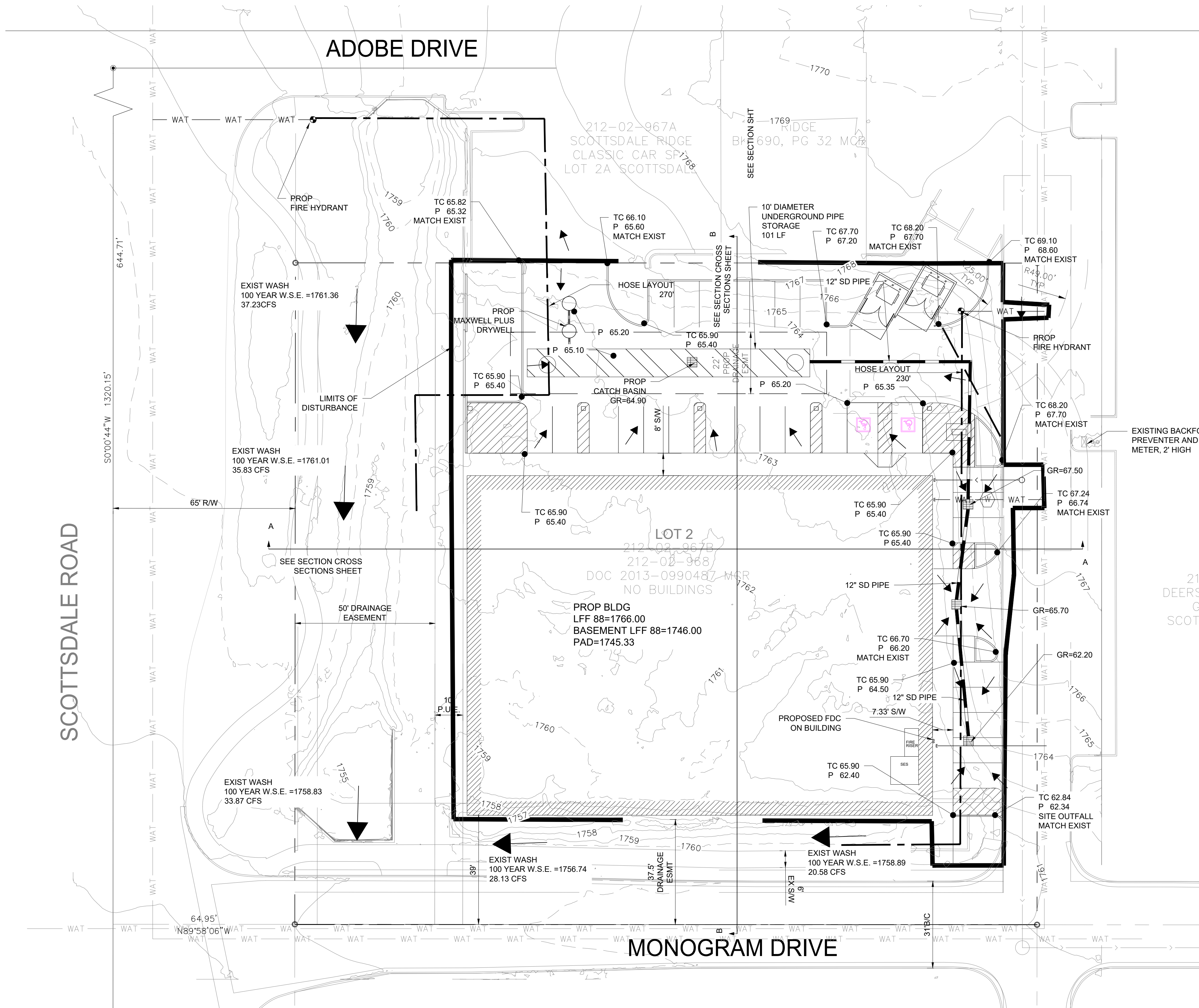
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Scottsdale Storage Retention Calculations				
Disturbed Area (SF)	*D (IN)	C Factor	**REQUIRED RETENTION VOLUME (CF)	RETENTION PROV'D (CF)
46,096	2.38	0.86	7,862	7,929

*D from City of Scottsdale Isopluvial Map located in Appendix, C Factor from Scottsdale Design Standards Manual Page 20 Included in Appendix
 **Retention required = C*D/12*A

Scottsdale Storage Underground Storage Tanks					
Pipe Diameter (ft)	Volume per LF (cf)	Retention Req'd (cf)	Length Pipe Req'd (LF)	Total Length of Pipe Prov'd (lf)	Total Volume Prov'd
10	78.5	7,862	100.2	101	7,929



SITE DATA:
 APN: 212-02-967B & 212-02-968
 NET SITE AREA: 62,670 S.F. 1.439 ACRES
 DISTURBED AREA: 40,206 S.F. 0.92 ACRES

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1784 CapitalHoldings

PROJECT DESCRIPTION
PROPOSED INTERNALIZED COMMUNITY STORAGE

SCOTTSDALE
 ARIZONA

ISSUE DATES
PRELIMINARY NOT FOR CONSTRUCTION

SD	SCHEMATIC DESIGN	05-20-19
MARK	DESCRIPTION	DATE

PROJECT NO: 20192780
 DRAWN BY: MAB
 CHECKED BY: MAB

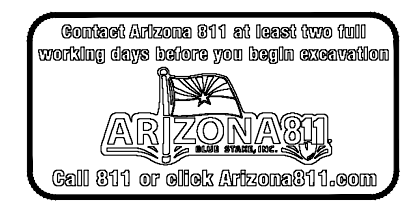
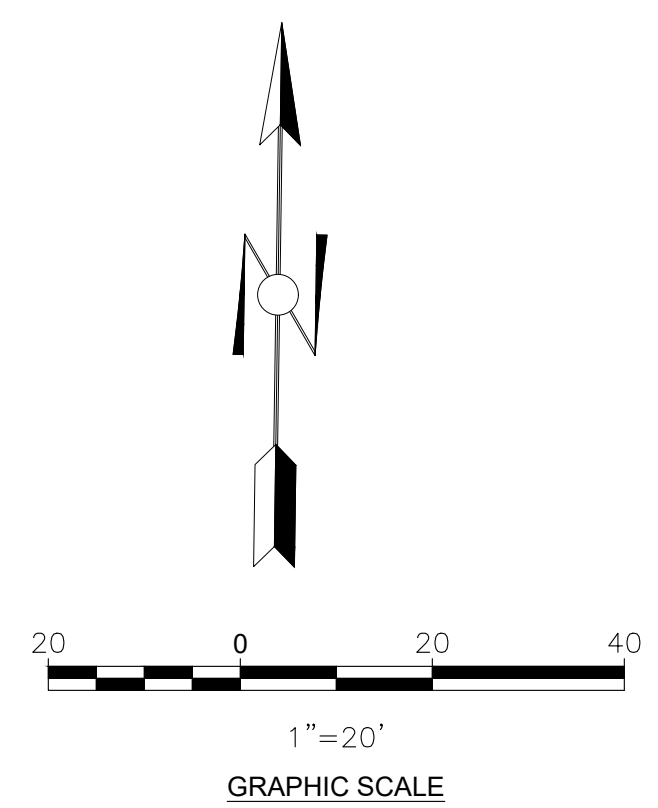
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DRAWING TITLE
GRADING

FEMA INFORMATION:

COMMUNITY NUMBER	PANEL # PANEL DATE	SUFFIX	DATE OF FIRM (INDEX DATE)	FIRM ZONE
04013	04013C1320L, 10/16/2013	L	10/16/2013	X & AO

THE LOWEST FLOOR ELEVATION(S) AND/OR FLOOD PROOFING ELEVATION(S) ON THIS PLAN ARE SUFFICIENTLY HIGH TO PROVIDE PROTECTION FROM FLOODING CAUSED BY A 100-YEAR STORM, AND ARE IN ACCORDANCE WITH SCOTTSDALE REVISED CODE, CHAPTER 37 - FLOODPLAIN AND STORMWATER REGULATION



CALCULATIONS

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Scottsdale Storage

Underground Storage Tanks

Pipe Diameter (ft)	Volume per LF (cf)	Retention Req'd (cf)	Length Pipe Req'd (LF)	Total Length of Pipe Prov'd (lf)	Total Volume Prov'd
10	78.5	7,862	100.2	101	7,929

FEMA FIRM

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National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | | |
|------------------------------------|--|--|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE)
<i>Zone A, V, A99</i> |
| | | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i> |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i> |
| | | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i> |
| | | Area with Reduced Flood Risk due to Levee, See Notes, <i>Zone X</i> |
| | | Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i> |
| | | Effective LOMRs |
| | | Area of Undetermined Flood Hazard <i>Zone D</i> |
| GENERAL STRUCTURES | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| OTHER FEATURES | | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| MAP PANELS | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

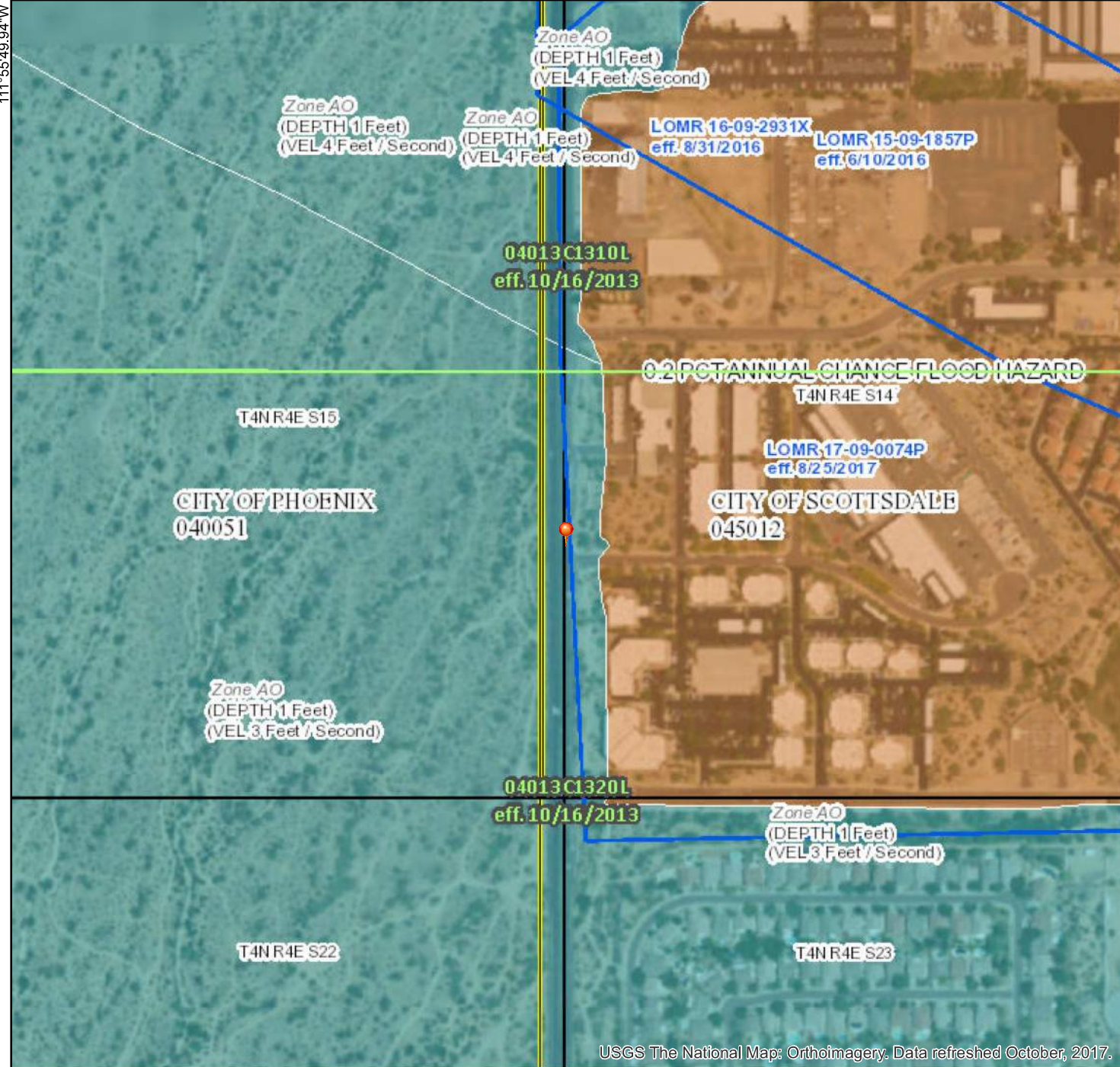
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/25/2019 at 11:57:18 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

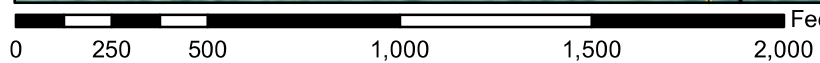
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective. unmapped and unmodernized areas can regulatory purposes.

28-DR-2019
8/16/2019

33°41'25.45"N



111°55'49.94"W



1:6,000

33°40'55.51"N

111°55'12.49"W

USGS The National Map: Orthoimagery. Data refreshed October, 2017.

CITY OF SCOTTSDALE DESIGN CRITERIA

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2. Time of Concentration

Time of concentration “T_c” is the total time of travel from the most hydraulically remote part of the watershed to the concentration point of interest. The calculation of “T_c” must follow FCDMC Hydrology Manual procedures.

***Note: Do not add a standard set amount of time to the estimated “T_c” for lot runoff delay (such as 5 or 10 minutes).** Natural land slopes are too variable in Scottsdale to add a set amount of time for lot runoff.

3. Runoff Coefficients

Use [Figure 4.1-4](#) or equivalent to obtain the runoff coefficients or “C” values. Composite “C” values for the appropriate zoning category or weighted average values calculated for the specific site are both acceptable approaches.

RUNOFF COEFFICIENTS - “C” VALUE			
Land Use	Storm Frequency		
	2-25 Year	50 Year	100 Year
Composite Area-wide Values			
Commercial & Industrial Areas	0.80	0.83	0.86
Residential Areas-Single Family (average lot size)			
R1-1-1901	0.33	0.50	0.53
R1-130	0.35	0.51	0.59
R1-70	0.37	0.52	0.60
R1-43	0.38	0.55	0.61
R1-35 (35,000 square feet/lot)	0.40	0.56	0.62
R1-18 (18,000 square feet/lot)	0.43	0.58	0.64
R1-10 (10,000 square feet/lot)	0.47	0.62	0.67
R1-7 (7,000 square feet/lot)	0.51	0.64	0.94
Townhouses (R-2, R-4)	0.63	0.74	0.94
Apartments & Condominiums (R-3, R-5)	0.76	0.83	0.94
Specific Surface Type Values			
Paved streets, parking lots (concrete or asphalt), roofs, drive-ways, etc.	0.90	0.93	0.95
Lawns, golf courses, & parks (grassed areas)	0.20	0.25	0.30
Undisturbed natural desert or desert landscaping (no impervious weed barrier)	0.37	0.42	0.45
Desert landscaping (with impervious weed barrier)	0.63	0.73	0.83
Mountain terrain – slopes greater than 10%	0.60	0.70	0.80
Agricultural areas (flood-irrigated fields)	0.16	0.18	0.20

FIGURE 4.1-4 RUNOFF COEFFICIENTS FOR USE WITH RATIONAL METHOD

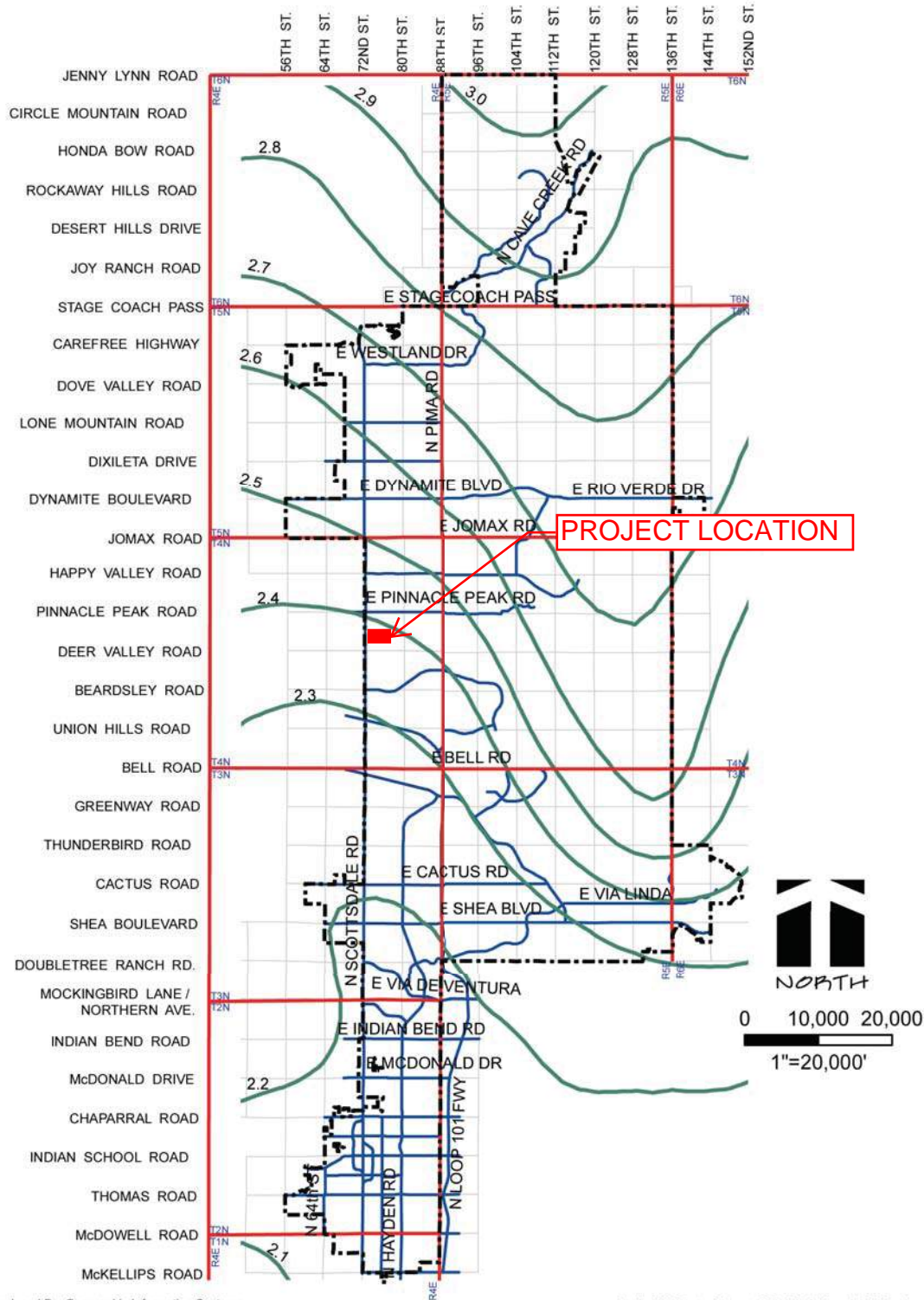
CITY OF SCOTTSDALE ISOPLUVIAL MAP

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28-DR-2019
8/16/2019

100 Year 2 Hour Precipitation in Inches



Map Produced By: Geographic Information Systems
04/03/2009

Rainfall Data From NOAA Atlas 14 Vol. 1

UNDERGROUND STORAGE DURABILITY GUIDE

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■ This Guide provides environmental ranges for CSP products. Service Life of CSP will vary within these ranges. For estimating average invert service life, refer to the Service Life Prediction section in this Guide or the Durability chapters of the AISI publication *Handbook of Steel Drainage & Highway Construction Products* or the *Modern Sewer Design*. ■ This Guide is not a substitute for professional engineering advice and is made without guarantee or representation as to results. Although every reasonable effort has been made to assure its accuracy, neither the National Corrugated Steel Pipe Association nor any of its members or representatives warrants or assumes liability or responsibility for its use or suitability for any given application.

Product Usage Guidelines for Corrugated Steel Pipe

COATING	WATERSIDE						
	Normal Conditions	Mildly Corrosive	Corrosive	Non-Abrasive/Low Abrasion (Lvl. 1 & 2)	Moderate Abrasion (Level 3)	High Abrasion (Level 4)	Provides Additional Soil Side Protection
Zinc Coated (Galvanized)	★	★	○	○	○	○	○
Aluminum Coated Type 2	○	○	○	○	○	○	○
Asphalt Coated	○	○	○	○	○	○	○
Asphalt Coated and Paved	○	○	○	○	○	○	○
Polymerized Asphalt Invert Coated*	○	○	○	○	○	○	○
Polymer Precoated	○	○	○	○	○	○	○
Polymer Precoated and Paved	○	○	○	○	○	○	○
Polymer Precoated w/ Polymerized Asphalt	○	○	○	○	○	○	○
Aramid Fiber Bonded Asphalt Coated	○	○	○	○	○	○	○
Aramid Fiber Bonded and Asphalt Paved	○	○	○	○	○	○	○
High Strength Concrete Lined	○	○	○	○	○	○	○
Concrete Paved Invert (75mm (3") Cover)	○	○	○	○	○	○	○

* Use Asphalt Coated Environmental Ranges for Fully Coated Product

Note: Coatings listed under additional soil side protection are generally considered to provide 100 years service life from a soil side perspective within appropriate environmental conditions.¹

ENVIRONMENTAL RANGES:

- **Normal Conditions:** pH = 5.8 – 8.0 (for R > 2000 ohm-cm)
- **Mildly Corrosive:** pH = 5.0 – 5.8 and/or for R = 1500 to 2000 ohm-cm
- **Corrosive:** pH < 5.0 (for R < 1500 ohm-cm)

ABRASION

Invert Protection/Protective Coatings can be applied in accordance with the following abrasion criteria. Abrasion velocities should be evaluated on the basis of frequency and duration. Consideration should be given to a frequent storm such as a two year event (Q₂) or mean annual discharge (Q_{2.33}) or less when velocity determination is necessary.

ABRASION LEVELS

The following qualitative definitions are provided as guidance to evaluate abrasion conditions when necessary.

Non-Abrasive (Level 1): No bedload regardless of velocity; or storm sewer applications.

Low Abrasion (Level 2): Minor bedloads of sand and gravel and velocities of 5 ft./sec. or less.

Moderate Abrasion (Level 3): Bedloads of sand and small stone or gravel with velocities between 5 and 15 ft./sec.

Severe Abrasion (Level 4): Heavy bedloads of gravel and rock with velocities exceeding approximately 15 ft./sec.

Protective Coatings and Pavings

All corrugated steel pipes have a metallic coating for corrosion protection. When the coating selected does not provide the required service life or is outside the appropriate environmental conditions, an alternate coatings system can be selected. Often the required service life can also be achieved by increasing the sheet thickness; this alternative should be weighed against the cost of supplemental coatings. Galvanizing is the most widely used metallic coating and is the basis for the Service Life Chart shown on page 4.

A. METALLIC COATINGS

Zinc-coated (Galvanized) Steel (AASHTO M36, ASTM A929) is produced with a coating weight of 610 g/m² (2 oz/ft²) of surface (total both sides) to provide zinc coating thickness of 43 μm (0.0017 in.) on each surface.

4 Ounce Zinc-coated (Galvanized) Steel is a new coating produced with a coating weight of 1220 g/m² (4 oz/ft²) of surface (total both sides) to provide zinc coating thickness of 6 μm (0.0034 in.) on each surface. This coating has been evaluated in the lab and is currently being evaluated in field installations. Initial lab tests have indicated increased corrosion and abrasion protection. Specific performance recommendations will be provided when further data is available.

Aluminum Coated Type 1 (AASHTO M36, ASTM A929) is an aluminum coating with 5 to 11% silicon. It is produced with a coating weight of 305

g/m² (1 oz/ft²) of surface (total both sides) to provide a coating thickness of 48 μm (0.0019 in.) on each surface. Service life will be addressed when sufficient data becomes available.

Aluminum Coated Type 2 (AASHTO M274, ASTM A929) is a pure aluminum coating (no more than 0.35% silicon). It is produced with a coating weight of 305 g/m² (1 oz/ft²) of surface (total both sides) to provide a coating thickness of 48 μm (0.0019 in.) on each surface.

B. NON-METALLIC COATING & PAVINGS

Asphalt Coated (AASHTO M190, ASTM A849). An asphalt coating is applied to the interior and exterior surface of the pipe with a minimum thickness of 1.3 mm (0.05 in.) in both fully coated and half coated.

Invert Paved with Asphalt Material (AASHTO M190, ASTM A849). An asphalt material is used to fill the corrugations and provide a minimum thickness of 3.2 mm (1/8 in.) above the crest of the corrugations for at least 25% of the circumference of round pipe and 40% of the circumference for pipe arch.

Invert Paved with Concrete Material (ASTM A849, ASTM A979). A 75 mm (3 in.) thick concrete layer is placed in the installed pipe for at least 25% of the circumference of round pipe and 40% of the circumference for pipe arch.

Fully Lined with Asphalt Material (ASTM A849). An asphalt material is used to fill the corrugations

and provide a minimum thickness of 3.2 mm (1/8 in.) above the crest of the corrugations providing a smooth surface over the entire pipe interior.

Fully Lined with Concrete Material (ASTM A849, ASTM A979). A high strength concrete material is used to fill the corrugations and provide a minimum thickness of 3.2 mm (1/8 in.) above the crest of the corrugations providing a smooth surface over the entire pipe interior.

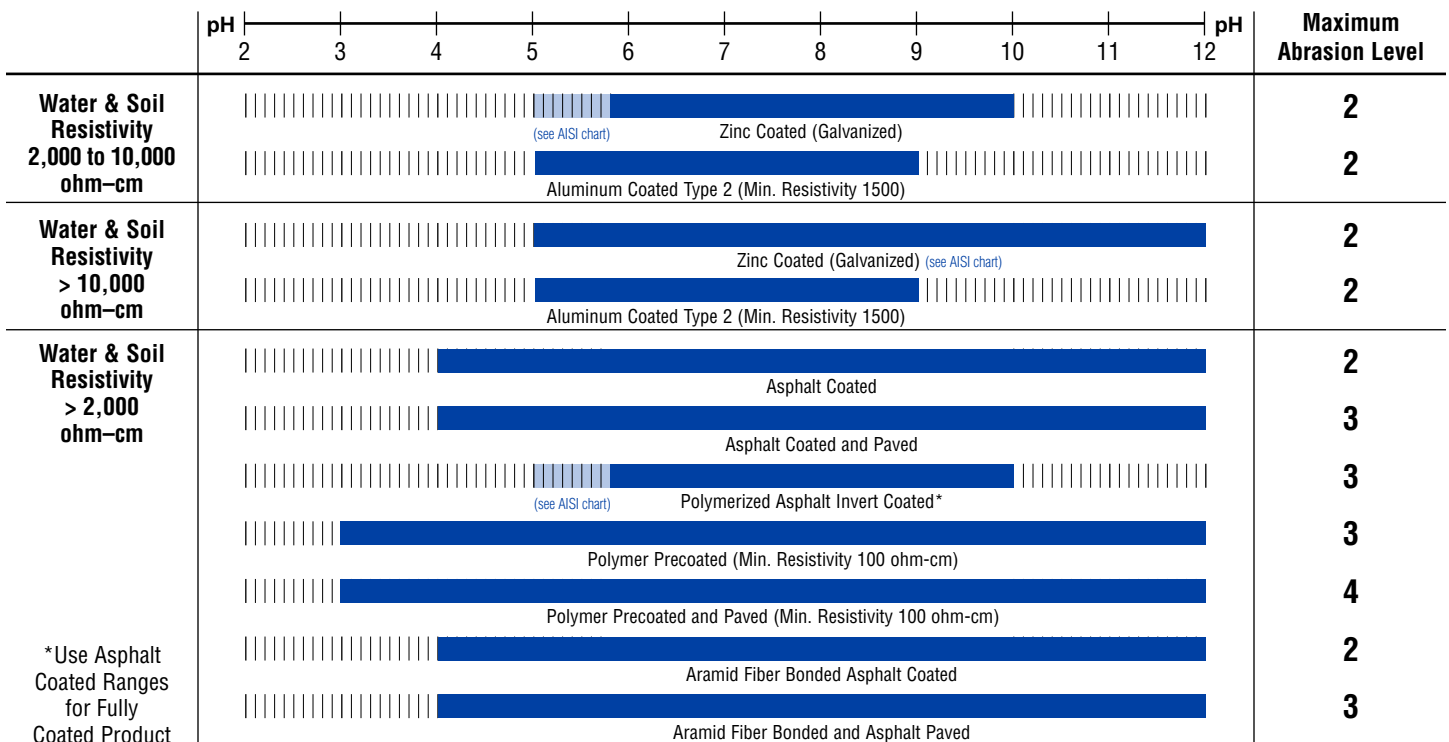
Invert Coated with Polymerized Asphalt Material (ASTM A849). A polymer modified asphalt material is used to provide a minimum thickness of 1.3 mm (0.05 in.) for at least 25% of the circumference of round pipe and 40% of the circumference for pipe arch. Generally used for invert treatments only.

Invert Paved with Polymerized Asphalt Material (ASTM A849). An asphalt material is used to fill the corrugations and provide a minimum thickness of 1.3 mm (0.05 in.) above the crest of the corrugations for at least 25% of the circumference of round pipe and 40% of the circumference for pipe arch.

Polymer Precoated (AASHTO M245, ASTM A742). A laminate film is applied over protective metallic coatings. The 10/10 grade (10 mils thickness, each side) is the primary product used.

Aramid Fiber Bonded Asphalt Coated (ASTM A885). An aramid fiberfabric is embedded in the zinc coating while it is still molten, which improves bonding to the asphalt coating.

Environmental Guidelines for Corrugated Steel Pipe



Service Life for Corrugated Steel Pipe

A. METALLIC COATINGS

As discussed above, CSP coatings can be classified into two broad categories, metallic and non-metallic coatings and pavings. Metallic coatings commercially available include zinc (galvanized) and aluminum coated (Type 2). Several non-metallic coatings are available as shown in this document. The following discussion explains the differences and similarities of the two metallic coatings.

All metals form some type of corrosion product when they corrode, regardless of whether they are protective metallic coatings such as aluminum or zinc, or the base steel. Typically the corrosion product, such as an oxide, is more stable and its buildup will result in a decreasing corrosion rate. In practice, corrosion products formed through the galvanic cell (pit) may be deposited in small discontinuities in the coating and serve to stifle further corrosion just as films of corrosion products protect solid surfaces. Thus, the development of scales on metal surfaces is an important consideration when using metals in waters.¹

Zinc-Coated (Galvanized)²

Zinc corrodes much more slowly than steel in natural environments and it galvanically protects steel at small discontinuities in the coating. Its excellent resistance to corrosion is due to the formation of protective films on zinc during exposure. On the average, the rate of attack of zinc is approximately 1/25 that of steel in most atmospheres and various waters.

High corrosion rates in strongly acidic and strongly alkaline solutions can be attributed to the absence of film on the metal surface (stable films are present on the surface when the corrosion rates are low). Lab test indicated stable films in the pH range from about 6 to 12.5.

Aluminum Coated Type 2

"Aluminum is a reactive metal, but it develops a passive aluminum oxide coating or film that protects it from corrosion in many environments."³ This film is quite stable in neutral and many acid solutions but is attacked by alkalis greater than a pH of 9. From a corrosion standpoint, aluminum has an advantage over galvanized in lower pH and in soft water due to the formation of the oxide film. (Soft waters are generally classified as waters with a hardness of 50 parts per million CaCo₃ or less.) The coatings are essentially equal under abrasion⁸ and in waters where the zinc oxide film forms rapidly.

Service Life

The service life of zinc coated galvanized is determined using the AISI Chart on page 4.

This chart predicts a variable service life based on pH and resistivity of water and soil and has been an industry standard for many years. Many specifying agencies view service life of aluminum coated type 2 as having additional service life over galvanized.^{4,5,6,7} This advantage varies throughout the country from minimal to significant depending on the environment and the geographic location. Users are encouraged to review the practices in their area.

For the purposes of this Guide, aluminum coated type 2 can provide a service life range of a minimum 1.3 times the AISI chart for galvanized (roughly 1 gage) and up to to 75 years (possibly more) in the appropriate environmental conditions. This is consistent with the range of practice by state and federal specifying agencies. The specific multiplier used for design purposes should be based on comparable experience under similar environmental conditions. There may be conditions where the actual performance is more than or less than this range. The significant advantage appears to be either for more corrosive effluent or soft waters where the protective scale forms rapidly for aluminum. In benign environments or where protective scales form rapidly on zinc, there may be little advantage.

AISI Method for Service Life Prediction

The service life of CSP can be reasonably predicted based on the environmental conditions, the thickness of the steel, and life of the coating. The most practical method of predicting the service life of the invert is with the AISI (American Iron and Steel Institute) chart shown on page 4.⁹ This chart is based on 16 gage galvanized CSP with a 610 g/m² (2 oz/ft²) coating and can be applied to other thicknesses with the appropriate factor. See discussion above for estimating the service life of aluminum coated type 2.

The AISI chart, which gives service life in terms of resistivity and pH, was developed from a chart originally prepared by the California Department of Transportation (Caltrans).¹⁰ The Caltrans study of durability was based on life to first perforation in culverts that had not received any special maintenance treatment. The results included the combined effects of soil-side and interior corrosion, as well as the average effects of abrasion. For pipes where the pH was greater than 7.3, soil-side corrosion controlled and life could be predicted by resistivity. For pipes where the pH was less than 7.3, the interior invert corrosion generally controlled and both resistivity and pH were important. In the field inspection of 7000 culverts in California for Caltrans, Richard Stratfull, Lead Project

Investigator, states he "has no memory of a corrosion perforation being initially found other than in the invert." At least 70 percent of the pipes were expected to last longer than the chart prediction.

The consequences of small perforations are minimal in a gravity flow pipe such as most storm sewers and culverts and do not accurately reflect the actual service life. Because of this fact, the original curves were converted by Stratfull to average service life curves using data on weight loss and pitting in bare steel developed by the National Institute of Standards and Technology. Since storm sewers and culverts are usually designed with a structural safety factor of at least 2.0, a significant safety factor of 1.5 remains at the end of the service life predicted by the chart. Thus, use of the chart is considered reasonably conservative. The Caltrans Method may be appropriate for use under pressure applications. Where service life is controlled by invert performance, rehabilitation of the invert at the end of the predicted life can extend service life significantly.

Soil-Side Durability

A study performed by Corrpro Companies in 1986 found that soil-side durability is generally not the limiting factor in designing CSP systems. "Survey results indicate that 93.2 percent of the plain galvanized installations have a soil-side service life in excess of 75 years, while 81.5 percent have a soil-side service life in excess of 100 years."¹¹

The study also found that soil moisture contents below 17.5 percent did not exhibit any accelerated corrosion. "Under most circumstances, corrosion rates are directly related to soil moisture content. However, for galvanized steel storm sewer and culvert pipe, the soil moisture content primarily affects the activity of any chloride ions present and the chloride's acceleration of the corrosion. Where the soil moisture content was below 17.5 percent, the chloride ion concentration did not have a significant affect on the corrosion rate of the zinc coating."

A computer program to estimate soil-side service life is included in "Final Report, Condition and Corrosion Survey of Corrugated Steel Storm Sewers and Culvert Pipe," and is available from NCSPA.

Steps in Using the AISI Chart

The durability design chart can be used to predict the service life of galvanized CSP and to select the minimum thickness for any desired service life. Add-on service life values are provided in the table on page 5 for additional coatings.

- 1) Locate on the horizontal axis the soil resistivity (R) representative of the site.
- 2) Move vertically to the intersection of the sloping line for the soil pH. If pH exceeds 7.3 use the dashed line instead.
- 3) Move horizontally to the vertical axis and read the service life years for a pipe with 1.6 mm (0.064 in.) wall thickness.
- 4) Repeat the procedure using the resistivity and pH of the water; then use whichever service life is lower.
- 5) To determine the service life for a greater wall thickness, multiply the service life by the factor given in the inset on the chart.

Additional Service Life

Additional service life can be provided by increasing the thickness of the base steel in accordance with the factors shown in the Chart for Estimating Average Invert Service Life or with the use of additional coating systems. Add-on service life values are provided in the Tables on page 5.

B. NON-METALLIC COATING & PAVINGS

Non-metallic coatings offer advantages over metallic coatings in the form of increased abrasion resistance, wider environmental ranges and longer service life. Inherent in these coatings is less variability in performance which is why specific add-on service life values are recommended under various abrasion levels.

Asphalt Coated – Asphalt coatings are generally used for soil-side protection but also provide additional waterside protection. Numerous studies have concluded that asphalt coating typically provides 10 years additional service life to the inside of the pipe.^{12,13,14,15,16} Asphalt coatings provide much higher service life on the soil-side and inherently extend the environmental ranges for soil conditions. According to Corpro¹¹, “study results indicate that the addition of an asphalt coating may have provided a soil side service life in excess of 100 years.”

Asphalt Coated and Paved – Asphalt coated and paved provide both additional service life and added abrasion protection on the water side of the pipe. Based on several studies, coated and paved is considered to provide an additional 30 years service life under most abrasion levels.^{12,13,15,16,17,18}

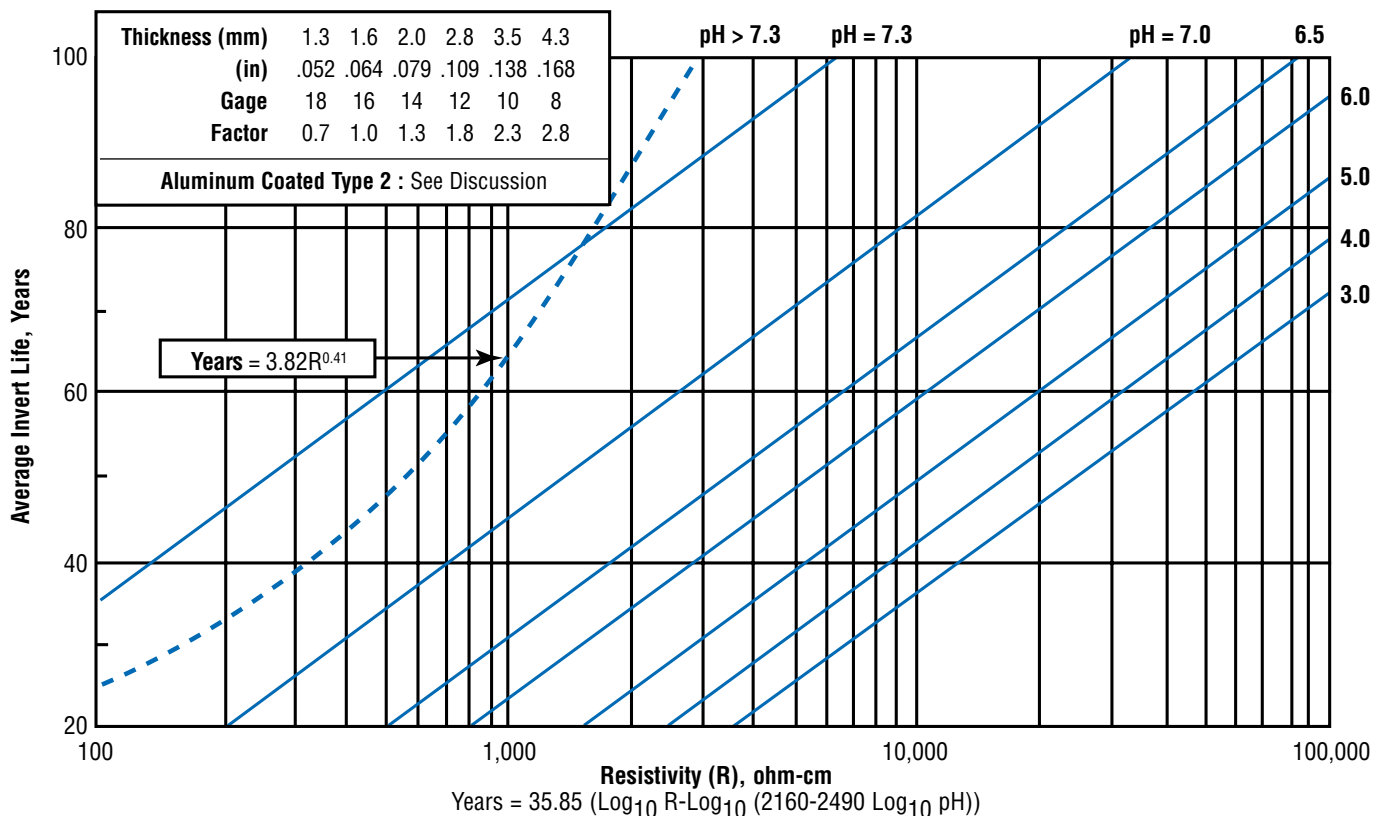
This is considered a very conservative estimate for non abrasive and low abrasion (level 1 and 2).

Polymerized Asphalt Invert Coated – Polymerized asphalt provides improved adhesion and abrasion resistance over standard asphalt products.⁸ Full scale abrasion tests conducted by Ocean City Research indicate no deterioration of the coating under moderate abrasion (level 3)¹⁹.

Based on independent test lab results using test method ASTM A926, results indicate that the commercially available polymerized asphalt coating lasts at least 10 times longer than standard asphalt coating and at least three times longer than standard culvert coated and paved.⁵

Polymer Precoat – Polymer precoat provides excellent adhesion to the base steel and extended corrosion and abrasion resistance. The service life recommendation are based on extensive lab and field tests.^{8,19,20,21,22} According to PSG²², “No corrosion was observed on any of the coated (polymer coated) pipes. We can not find any data to suggest the pipe coating would not provide at least one hundred years service.” Sites contained environmental conditions with Resistivity as low as 100 ohm-cm and pH as low as 2.1. In addition, PSG conducted current requirement testing that is designed to determine corrosion activity of a given

AISI Chart for Estimating Average Invert Life for Galvanized CSP



structure. The current requirement data shows polymer coated structures have up to 10,000 times less corrosion versus bare G210 galvanized. Recent tests conducted by Ocean City Research indicate polymer coated withstanding abrasion level three conditions.¹⁹(Note: Corrosion conditions at the extreme limits of the environmental ranges may require adjusting add-on service life values).

Polymer Precoat and Asphalt Paved – Polymer precoat and asphalt paved benefits from the excellent adhesion of the polymer precoat to the base steel and the subsequent adhesion of the paving to the precoat. According to laboratory and field tests,^{22,23} The combination of the three coatings results in a pipe which is highly resistant to acidic

effluent. The bituminous material has much better adhesion to the polymeric coating than it does to the galvanizing.

Polymer Precoat with Polymerized Asphalt Invert Coated – Full scale abrasion tests conducted by OCR show equal performance of the polymerized asphalt over polymer precoat as standard asphalt paved.¹⁹ This system has the same bonding characteristics as the polymer precoat and paved. Field sites also indicate improved adhesion.²²

Aramid Fiber Asphalt Coated/ Aramid Fiber Asphalt Paved – The fibers embedded in zinc provide an anchor for the asphalt coating or paving to improve adhesion.

High Strength Concrete Lined – Concrete linings are typically used for improved hydraulic performance but also provide additional abrasion protection and extended service life. The use of high strength concrete and metallic coated steel provide the high service life values.

Concrete Invert Paved – Concrete inverts provide extreme abrasion protection and extended service life. According to Stratfull¹⁰, “metal pipe with an invert paved with concrete should provide an indefinite service life if it is of sufficient width, thickness and quality. By calculation, a 4-inch thick coating over the invert steel could be expected to postpone its initial time to corrosion by approximately 7.7 times greater than a 3/4 inch coating.”

Estimated Service Life

Add-On Service Life for Non-Metallic Coatings (in years)				
COATING	WATER SIDE			References
	Level 1 & 2	Level 3	Level 4	
Asphalt Coated	10	N/R	N/R	12, 13, 14, 15, 16
Asphalt Coated and Paved	30	30	30	12, 13, 15, 16, 17, 18, 19
Polymerized Asphalt Invert Coated*	45	35	N/R	5, 8, 19
Polymer Precoat	80+	70	N/R	8, 19, 20, 21, 22
Polymer Precoat and Paved	80+	80+	30	22, 23
Polymer Precoat with Polymerized Asphalt Invert Coated	80+	80+	30	19, 22
Aramid Fiber Asphalt Coated	40	N/R	N/R	20
Aramid Fiber Asphalt Paved	50	40	N/R	20
High Strength Concrete Lined	75	50	N/R	10,24
Concrete Invert Paved (75mm (3 in.) cover)	80+	80+	50	10, 24

N/R Not recommended

REFERENCES

1. “Corrosion Basics: An Introduction,” National Association of Corrosion Engineers, 1984.
2. “Zinc: Its Corrosion Resistance,” C.J. Slunder and W.K. Boyd, 1971.
3. “Corrosion Engineering,” Mars G. Fontana, 1986.
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5. “California Highway Design Manual, Fifth Edition.”
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Compliments of



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UNDERGROUND STORAGE OPERATIONS MANUAL

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MAINTENANCE GUIDELINES

NOTE: TO MEET FOLLOWING SPECIFICATIONS
AASHTO M-36 (MANUFACTURING PROCESS)
AASHTO M-274 (ALUMINIZED)

ONE OF THE ADVANTAGES OF CORRUGATED STEEL PIPE DETENTION SYSTEMS IS THE EASE OF MAINTENANCE. LIKE ANY SYSTEM THAT COLLECTS POLLUTANTS, THE CORRUGATED STEEL PIPE DETENTION SYSTEM MUST BE MAINTAINED FOR CONTINUED EFFECTIVENESS. MAINTENANCE IS A SIMPLE PROCEDURE PERFORMED USING A VACUUM TRUCK OR SIMILAR EQUIPMENT.

THE SYSTEM CAN BE ACCESSED EASILY THROUGH THE MANHOLE COVER. THIS ALLOWS UNOBSTRUCTED ACCESS TO THE BOTTOM OF THE TANK FOR INSPECTION AND/OR CLEANING WHEN THE NEED ARISES.

PERIODIC INSPECTIONS SHOULD BE PERFORMED TO DETERMINE THE NEED FOR AND FREQUENCY OF MAINTENANCE. INSPECTING MAY BEGIN AS SOON AS CONSTRUCTION IS FINISHED AND THEREAFTER ON A QUARTERLY BASIS. TYPICALLY, IN AN AVERAGE SETTING NOT INTRODUCING A LOT OF STYROFOAM CUPS, SEDIMENT, PAPER BAGS, CIGARETTE BUTTS, OILS, ETC., CLEANING SHOULD ONLY BE NECESSARY EVERY 12-18 MONTHS. CLEANING SHOULD BE PERFORMED WHEN APPROXIMATELY 1 FOOT OF SEDIMENT AND/OR OTHER POLLUTANTS HAS ACCUMULATED.

ALL DEBRIS/POLLUTANTS REMOVED FROM THE SYSTEM SHOULD BE DISPOSED OF PROPERLY AT AN APPROVED FACILITY.

LOMR APPROVAL LETTER

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Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Scottsdale Maricopa County Arizona	NO PROJECT	HYDRAULIC ANALYSIS UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 045012		
IDENTIFIER	Garages of Scottsdale	APPROXIMATE LATITUDE & LONGITUDE: 33.688, -111.921 SOURCE: USGS QUADRANGLE DATUM: NAD 83	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 04013C1310L DATE: October 16, 2013 TYPE: FIRM* NO.: 04013C1320L DATE: October 16, 2013		NO REVISION TO THE FLOOD INSURANCE STUDY REPORT	

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Rawhide Wash - from the intersection with East Deer Valley Road to just downstream of East Williams Drive

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Rawhide Wash	Zone AO	Zone X (shaded)	NONE	YES

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in black ink, appearing to read "Rick F. Sacbibit".

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Jeffrey D. Lusk
Director, Mitigation Division
Federal Emergency Management Agency, Region IX
1111 Broadway Street, Suite 1200
Oakland, CA 94607-4052
(510) 627-7175

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
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Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below, and through FEMA's Flood Hazard Mapping website at https://www.floodmaps.fema.gov/fhm/bfe_status/bfe_main.asp

LOCAL NEWSPAPER

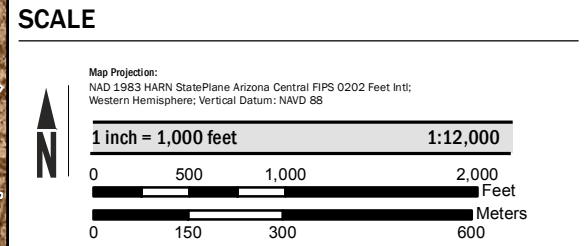
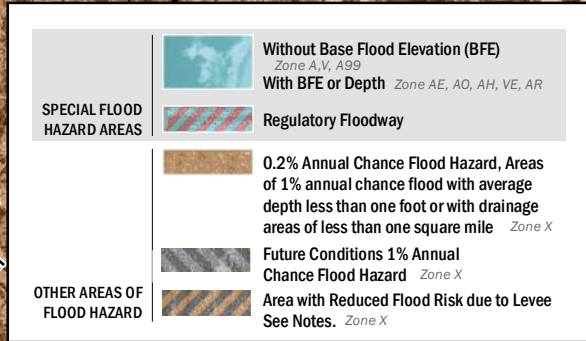
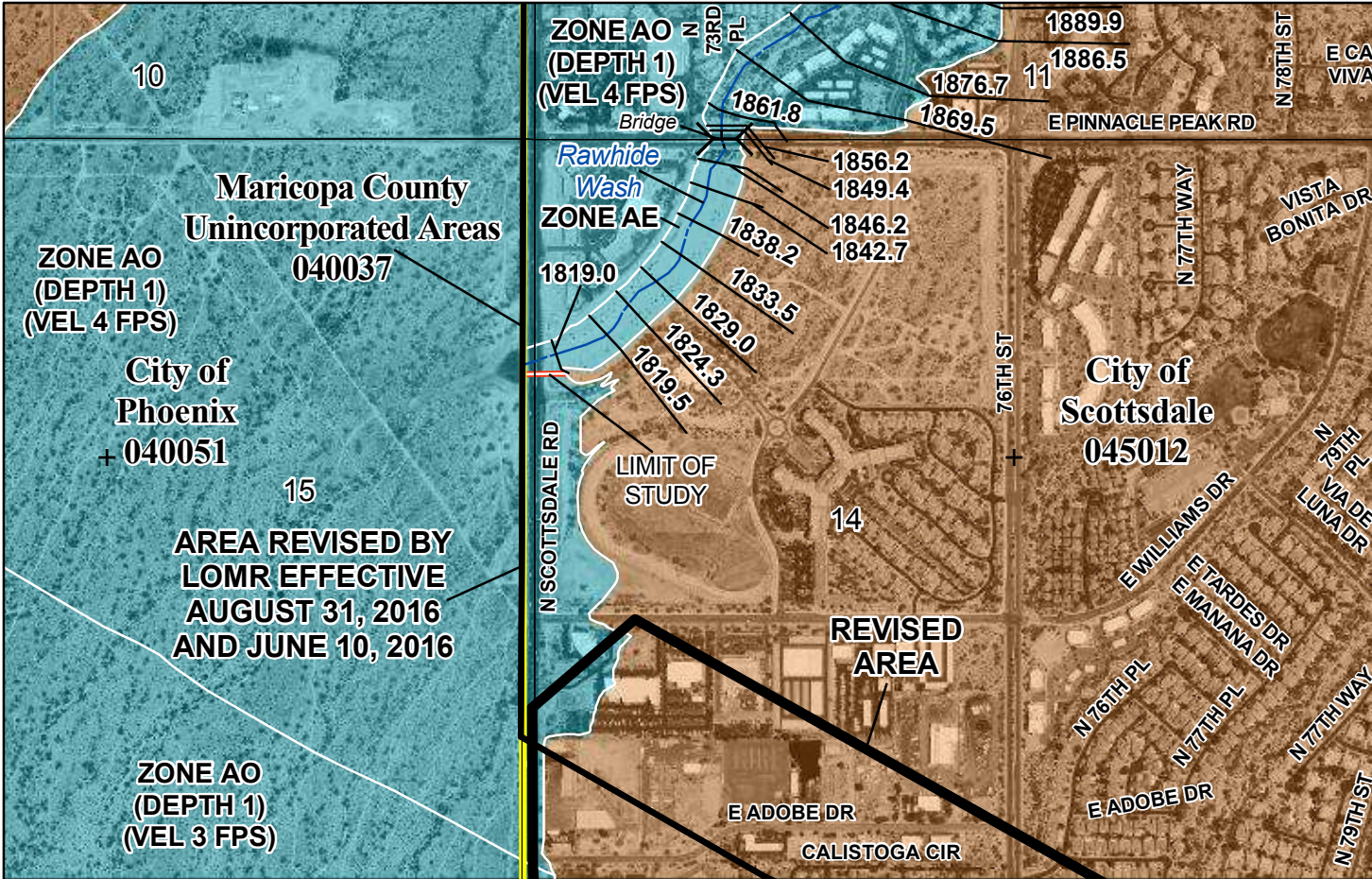
Name: *Arizona Business Gazette*
Dates: April 20, 2017 and April 27, 2017

Within 90 days of the second publication in the local newspaper, any interested party may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised flood hazard determination presented in this LOMR may be changed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in black ink, appearing to read "Rick Sacbbit".

Patrick "Rick" F. Sacbbit, P.E., Branch Chief
Engineering Services Branch
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FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA
and Incorporated Areas

PANEL 1310 OF 4425

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1310	L
PHOENIX, CITY OF	040051	1310	L
SCOTTSDALE, CITY OF	045012	1310	L

REVISED TO REFLECT LOMR EFFECTIVE: August 25, 2017

VERSION NUMBER
1.1.1.0

MAP NUMBER
04013C1310L

28-DR-2019
8/16/2019

Larson Engineering, Inc.
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Scottsdale, AZ 85251
480.212.4200
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Sewer Basis of Design Report

For

Scottsdale Storage

CASE#: 965-PA-2018

22001 N Scottsdale Road
Scottsdale, AZ 85255

Scottsdale, ARIZONA

PREPARED FOR:

RKAA Architects, Inc.
2233 E. Thomas Rd.
Phoenix, Arizona 85016

PREPARED BY:

Larson Engineering, Inc.
6380 E. Thomas Road, Suite 300
Scottsdale, AZ 85251
480.212.4200
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August 2019



Larson



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Summary	4

Appendix:

Sewer Exhibit

Calculations



Introduction

The proposed Scottsdale Storage (The Project) is located at 22001 N. Scottsdale Road in Scottsdale Road. The parcel numbers for this project is 212-02-967B and 212-02-968. The Project consists of adding a four story storage facility, curbing, refuse container, utilities, underground retention, a drywell and landscaping. The building is a floor layout of 24,340 square feet in size with four floors of varying floor layouts. The total square footage of the building is 97,595 square feet. The Project is located at the northeast corner of the intersection of Scottsdale Road at Monogram Drive. See Location Map below:



The Project will not alter the existing zoning, which is C-3. The surrounding area at This location is commercial businesses and consists of commercial services and offices along with undeveloped land to the west. The existing site is undeveloped land. The new building will remain consistent with the City of Scottsdale's general plan. There is an existing was to the immediate west and south of this proposed building. The project will not disturb the wash or drainage easement area.

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Design Documentation

Wastewater Design Flows are based on criteria provided in the City of Scottsdale's Design Standards & Policies Manual Chapter 7 dated 2018. This criteria was compared to the information provided in Chapter 9 Title 18 of the Arizona Administrative Code and was more conservative, thus satisfying both codes. Specifically, the design criteria used are as follows:

- | | |
|------------------------------|--------------------|
| • Average Daily Flow | 0.5 Gallons/SF/Day |
| • Peaking Factor (peak hour) | 3 |
| • Minimum Full Flow Velocity | 2.5 ft/s |
| • Maximum Full Flow Velocity | 10 ft/s |
| • Manning's Coefficient (n): | 0.013 |

Wastewater Calculations are attached in the Appendix for reference. The Manning Equation was utilized to analyze the proposed system.

Existing Conditions

The Project will not alter the existing zoning, which is C-3. The existing site is currently undeveloped land with a drainage wash to the west and south of the proposed building. The area to the north of the Project is a car wash, to the east is a business center, to the south is Monogram Road and the west is Scottsdale Road.

Proposed Conditions

The attached Wastewater Exhibit shows the tie in location for the proposed sewer. This Project proposes to use 6-inch SDR35 PVC pipe. The tie in is seen in the Utility Plan. All maintenance of the private onsite system is the responsibility of the owner.

Computations

The proposed wastewater collection system is designed to provide adequate capacity to serve the proposed Project. The proposed pipe is SDR35 PVC at 6 inch diameter. The slope is proposed 0.5% and the depth of cover of the pipe will be a minimum of 36" to top of pipe.

Summary

The Proposed Wastewater Distribution System has been analyzed to ensure all City of Scottsdale Design Standards and Policies Manual Chapter 7 requirements are being met. Figure 7.1-2 of that manual provided the demand and peaking factors included in the analysis and stated in this report.

Enclosed is a set of drawings and spreadsheets which summarize the design and capacity of the system.

Thank you for your prompt review of the proposed wastewater collection system.

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Scottsdale Storage

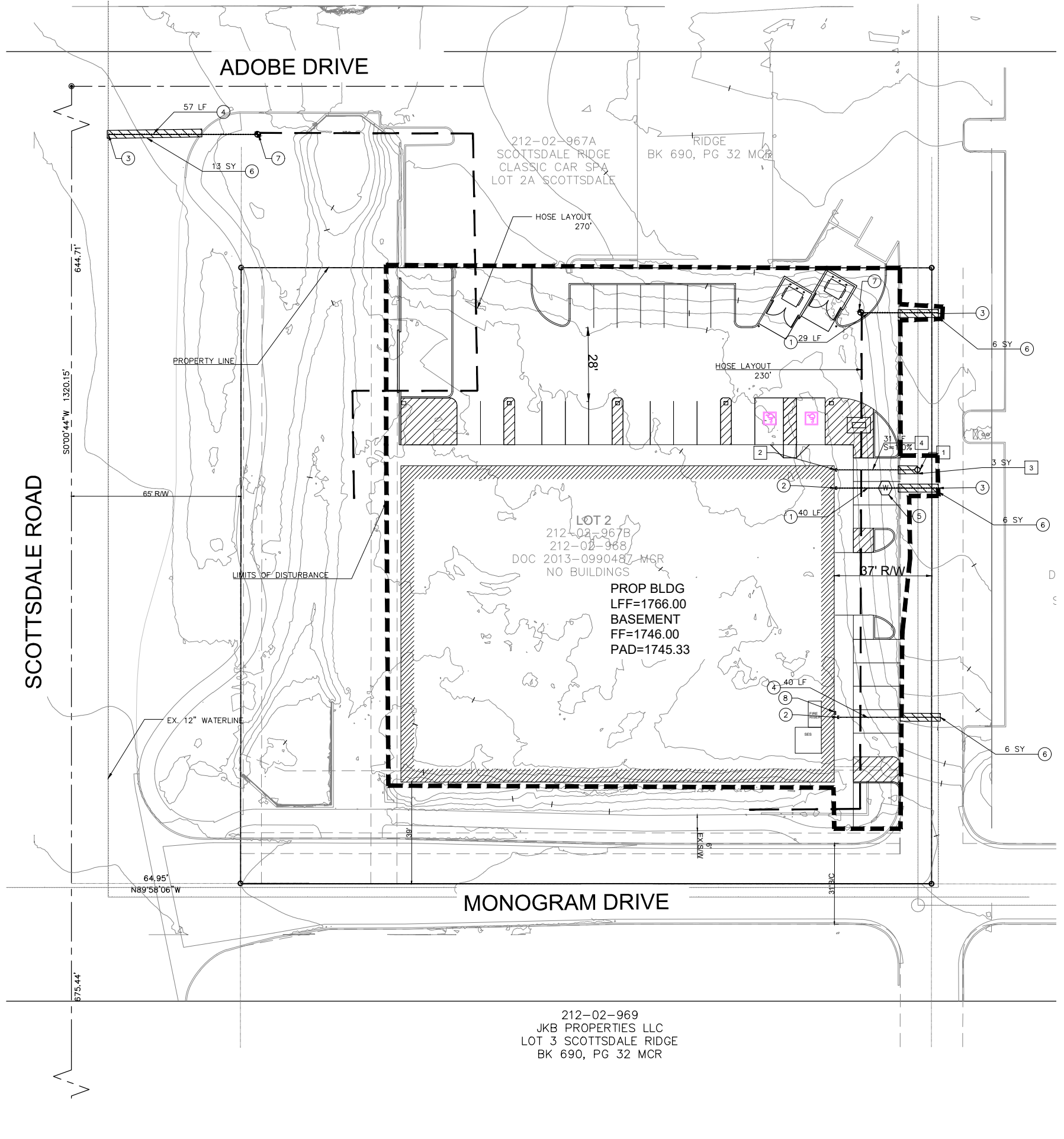
Wastewater Flows

Description	Use	Bldg Sqft	Demand ADF (Gal/SF/Day)	Avg. Daily Flow (GPD)	Peak Factor	Peak Flow (GPD)	Peak Daily Flow (GPM)
Storage Bldg	Office	1,441	0.5	721	3	2,162	1.50

Demand and Peak Factors based on City of Scottsdale's Design Standards & Policies Manual Chapter 7 Dated January 2010 only the office has sewer

Scottsdale Storage

Pipe Diameter (in)	Pipe Length (FT)	Pipe Slope(%)	Peak Daily Flow (gpm)	Max Capacity (GPM)	Velocity (ft/sec)
6	60	0.5%	1.50	252.4	2.9



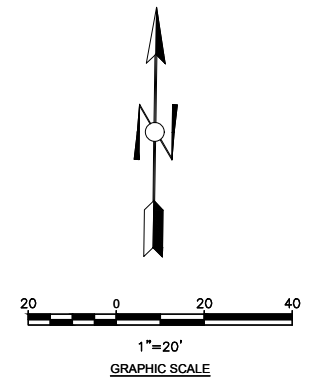
WATER CONSTRUCTION NOTES	QUANTITIES
1. INSTALL 1" TYPE K COPPER PIPE OR EQUIVALENT PER COS STD DTL 2201. MAINTAIN MINIMUM 36" OF COVER.	40 L.F.
2. CONNECT TO BUILDING, SEE PLUMBING PLANS	1 EA
3. CONNECT TO EXISTING 12" CIP WATERLINE WITH TAPPING SLEEVE AND VALVE PER COS STD DTL 2362-2.	1 EA
4. INSTALL 6" D.I.P. FIRELINE	126 LF
5. INSTALL 1" WATER METER	1 EA
6. PAVEMENT REPLACEMENT PER COS STD. DTL. 2200	34 SY
7. NEW FIRE HYDRANT PER MAG STD DTL 360-3	2 EA
8. SIAMESE FDC ON BUILDING, SEE ARCHITECTURAL AND PLUMBING PLANS	1 EA

SEWER CONSTRUCTION NOTES	QUANTITIES
1. INSTALL SEWER CLEANOUT AT EXISTING SEWER LOCATION	1 EA
2. CONNECT TO BUILDING SEWER SERVICE PER MAG STD. DTL. 440-1	1 EA
3. PAVEMENT REPLACEMENT PER COS STD. DTL. 2200	2.5 SY
4. INSTALL 6" SDR-35 PVC PIPE PER COS STD DTL 2201. SEE PLUMBING PLANS FOR CONTINUATION	31 LF

NOTE:
CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES AND TYPE OF MATERIAL BEFORE PROCEEDING WITH TRENCHING

LEGEND

	LIGHT DUTY CONCRETE
	LANDSCAPE AREA
	TRASH ROUTE
	EXISTING STORM DRAIN
	EXISTING WATERLINE
	EXISTING GAS LINE
	EXISTING OVERHEAD ELECTRIC
	EXISTING SANITARY SEWER
	EXISTING WATER METER
	EXISTING POWER POLE
	EXISTING STREET SIGN
	PROPOSED BUILDING OUTLINE
	CONCRETE BOLLARD
	DRIVEWAY CURB ENTRANCE
	LOADING ZONE



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CLIENT
1784 CapitalHoldings

PROJECT DESCRIPTION
PROPOSED INTERNALIZED COMMUNITY STORAGE

SCOTTSDALE
 ARIZONA

ISSUE DATES

**PRELIMINARY
 NOT FOR
 CONSTRUCTION**

SD	SCHEMATIC DESIGN	05-20-19
MARK	DESCRIPTION	DATE

PROJECT NO: 20192780
 DRAWN BY: MAB
 CHECKED BY: MAB

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DRAWING TITLE
UTILITY PLAN





Phase I Environmental Site Assessment

**1.438-Acre Property for Proposed Storage Facility
22001 North Scottsdale Road
Scottsdale, Arizona 85255**

Prepared for:

**Mr. Kelly McKone, Executive Vice President
1784 Capital Holdings, LLC
8777 North Gainey Center Drive, Suite 191
Scottsdale, Arizona 85258**

December 27, 2018

Project 26443



**GEOTECHNICAL ENGINEERING · ENVIRONMENTAL CONSULTING
CONSTRUCTION TESTING & OBSERVATION**



GEOTECHNICAL ENGINEERING • ENVIRONMENTAL CONSULTING • CONSTRUCTION TESTING & OBSERVATION

December 27, 2018

Project 26443

Mr. Kelly McKone, Executive Vice President
1784 Capital Holdings, LLC
8777 North Gainey Center Drive, Suite 191
Scottsdale, Arizona 85258

**Re: Phase I Environmental Site Assessment
1.438-Acre Property for Proposed Storage Facility
22001 North Scottsdale Road
Scottsdale, Arizona 85255**

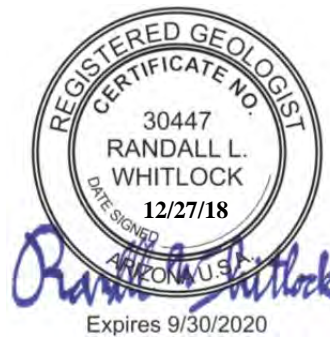
This is our Phase I Environmental Site Assessment (ESA) on the above-referenced property. This assessment was performed in conformance with the scope and limitations of ASTM E1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

Please present any questions or comments regarding the content of this report to us directly.

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312 and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the property. I have developed and performed All Appropriate Inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Respectfully submitted,

VANN ENGINEERING, INC.



Randall Whitlock, M.S., R.G.
Project Geologist, Environmental Services

Copies: Via e-mail only to bskoog@1784holdings.com

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SECTION I

EXECUTIVE SUMMARY

We have performed a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of ASTM Practice E1527-13 of the 1.438-acre property at 22001 North Scottsdale Road in Scottsdale, Arizona 85255. Any exceptions to, or deletions from, this practice are described at §1.1 of this report. This ESA was extended to include a Tier 1 Vapor Encroachment Screen performed in conformance with ASTM E2600-15. We understand 1784 Capital Holdings, LLC will purchase the property to build a new storage facility.

This assessment has revealed no evidence of recognized environmental conditions in connection with the property.

No features are plotted on the property in the 1906 USGS map. The property is seen to be entirely native desert in the 1953 aerial photograph and remained such until the sidewalk, drainage ditches and segment of Monogram Road were built in 2005. The driveway on the property's east margin was built in 2006. The middle of the property remains native desert. The circular dirt trail on the central and north portions of the property was blazed sometime after February, 2018.

A site reconnaissance of the property and vicinity on December 19, 2018 by Randall Whitlock revealed no evidence of recognized environmental conditions in connection with the property.

A review of regulatory agency lists and databases on December 20, 2018 by Randall Whitlock revealed no facilities on or near the property which may have adversely affected the property.

Our Tier 1 Vapor Encroachment Screen has revealed that a Vapor Encroachment Condition is unlikely to exist at the property.

We have no recommendations for further investigation of the property.



1.0 INTRODUCTION AND SCOPE OF WORK

1.1 Scope of Work

On behalf of 1784 Capital Holdings, LLC, we have performed a Phase I Environmental Site Assessment (ESA) of the 1.438-acre property at 22001 North Scottsdale Road in Scottsdale, Arizona 85255. We understand 1784 Capital Holdings, LLC will purchase the property to build a new storage facility.

This assessment has been performed in conformance with the scope and limitations of ASTM Practice E1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. ASTM E1527-13 incorporates the standards and practices of US EPA's "All Appropriate Inquiries" as set forth in 40 CFR Part 312. The primary purpose of the investigation was to determine if the available information indicates the possible presence of recognized environmental conditions at the property.

This ESA does not address any of the non-scope considerations noted in the ASTM standard. Sampling and testing of soils, soil gases, air or groundwater of the property were not part of our investigation. This ESA was extended to include a Tier 1 Vapor Encroachment Screen performed in conformance with ASTM E2600-15.

We are aware of no exceptions or deletions from the ASTM standard, except for the following:

- Since the property has never been developed with buildings, property-specific records of the Scottsdale Fire Department would not exist and no contact was made. We are not aware of any other local agency which would have useful environmental information about the property. Since the property has been developed only with pavement and drainage ditches around its margins, this lack of local agency contact is not a significant data gap.

1.2 Limitations

Our professional services have been performed using that degree of skill ordinarily exercised, under similar circumstances, by reputable environmental engineering firms practicing in this locality. No other warranty, expressed or implied, is made.

The contents of this report are intended for the sole use of the addressee(s). No other person or entity may rely on this report without the prior written consent of Vann Engineering, Inc.

Should deviations between actual and reported conditions be noted, we should first be contacted for review of the area of concern.

This report is valid as of its date of issuance and does not address changes that may occur afterward.



2.0 PROPERTY DESCRIPTION

2.1 Location

The property is two rectangular parcels at the northeast corner of Scottsdale Road and Monogram Road. Although the property has never been developed with buildings, Maricopa County Assessor online information gives its address as 22001 North Scottsdale Road, Scottsdale, Arizona 85255. As platted, the property includes the westbound lane of Monogram Road and part of the east bordering driveway.

The property's Maricopa County Assessor parcel numbers are 212-02-967B and 212-02-968. According to Assessor online information, the parcel size is 62,646 square feet or 1.438 acres.

More generally, the property is within the West Half of the Southwest Quarter of the Southwest Quarter of Section 14, Township 4 North Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

Please refer to the included Topographic Map for the location of the property in relation to surrounding landmarks and to the Plat Map in Section II for the precise property location.

2.2 Geology

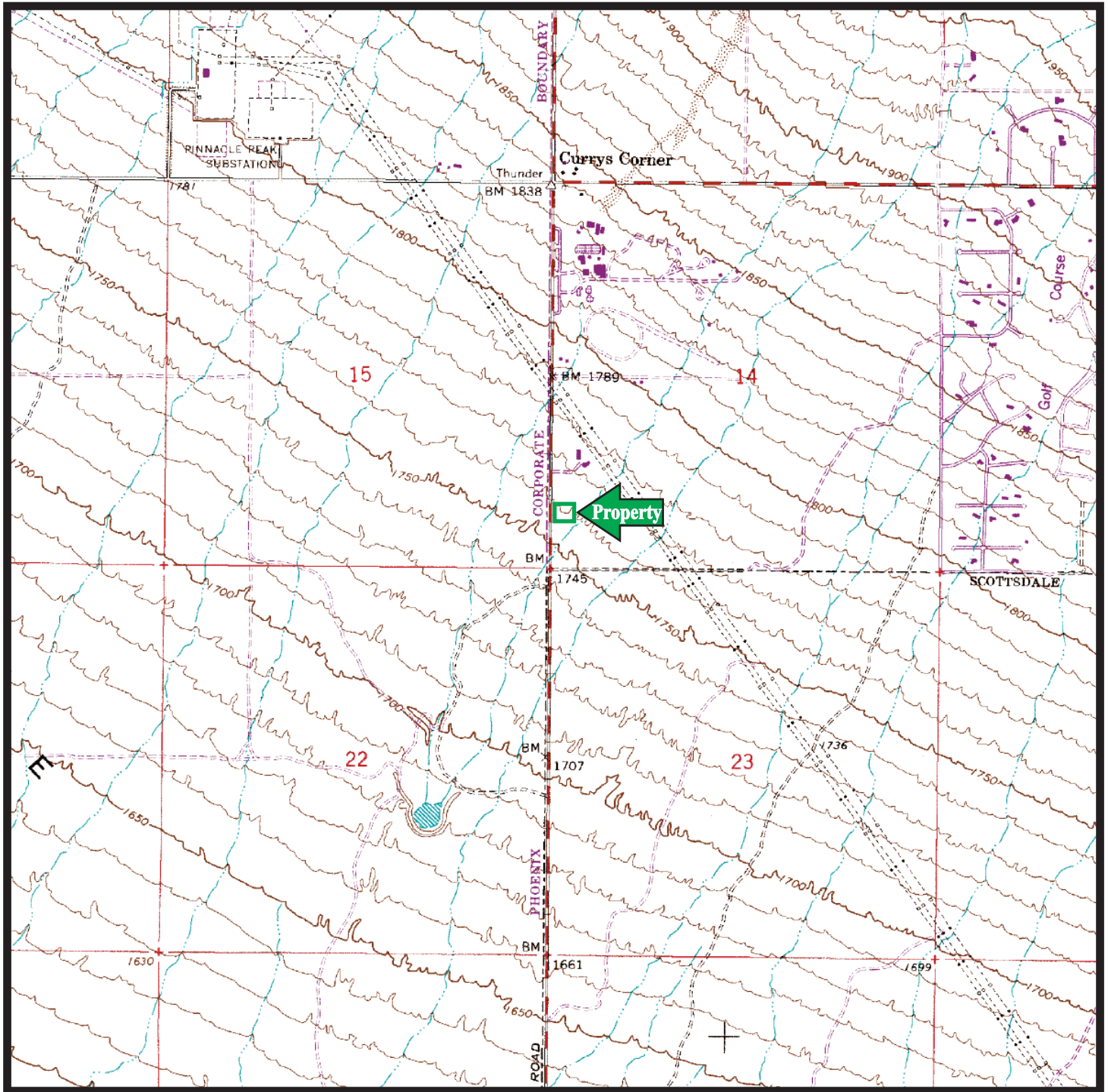
The property is within the Basin and Range province of Arizona. In this province, crustal extension by normal faulting has produced a series of short, steep mountain ranges alternating with deep basins. Over the course of time, the mountains have worn down and the basins have largely filled with alluvial sediments which can reach thicknesses of several thousand feet.

The nearest rock outcrops are found in the McDowell Mountains, just over three miles east of the property. These outcrops are composed of Precambrian granites, quartzites and schists. The McDowell Mountains are typical of the Basin and Range Province, having been uplifted along normal faults during the Tertiary Period.

The property is within Paradise Valley, a topographic basin bounded by the Phoenix Mountains and Union Hills on the west, the McDowell Mountains on the east, and the Tonto Foothills on the north. Paradise Valley merges with the Eastern Salt River Valley to the south.

The property's surface soil is sandy silt with gravel. The surface soil is underlain by alluvial fan sediments derived from weathering and erosion of the McDowell Mountains then deposited by ancient distributaries and intermittent tributaries to the ancestral Salt River system. These sediments include sand, gravel, silt and clay and are expected to be greater than 1,200 feet in thickness beneath the property.





Topographic Map



CONTOUR INTERVAL 10 FEET



Yann Engineering, Inc.
 Project 26443
 Prepared by RW

Prepared from USGS 7.5 Minute Topographic Map:
 Currys Corner, Arizona 1964, Photorevised 1982

2.3 Hydrology

According to information presented on Arizona Department of Water Resources (ADWR) Hydrologic Map Series Report No. 35, depth to groundwater was in excess of 600 feet and groundwater flow was toward the south at the property in 2002/2003.

The ADWR geographic information system plots no wells on the property.

Please refer to the included Depth to Water and Altitude of the Water Table map for a larger picture of groundwater flow in the vicinity of the property.

2.4 Storm Water Drainage

The property was observed with particular attention to the means of disposal of storm water derived on the property. In addition, adjoining properties were observed for indications of sources of contamination that could potentially migrate to the property via surface storm water or other drainage.

The property has an irregular surface remaining from historic natural rills. There are drainage ditches on its west and south sides. Most storm water falling on the property will infiltrate its bare soil from puddles formed in low-lying areas. Some storm water will enter the ditches and flow southward through a culvert under Monogram Road on the property's southwest corner. The west ditch receives storm water from the north adjoining property. Since this consists of parking lot drainage, it is unlikely to have adversely affected the property. Storm water from other adjoining properties is prevented from reaching the property by the slope of the bordering streets and driveways.

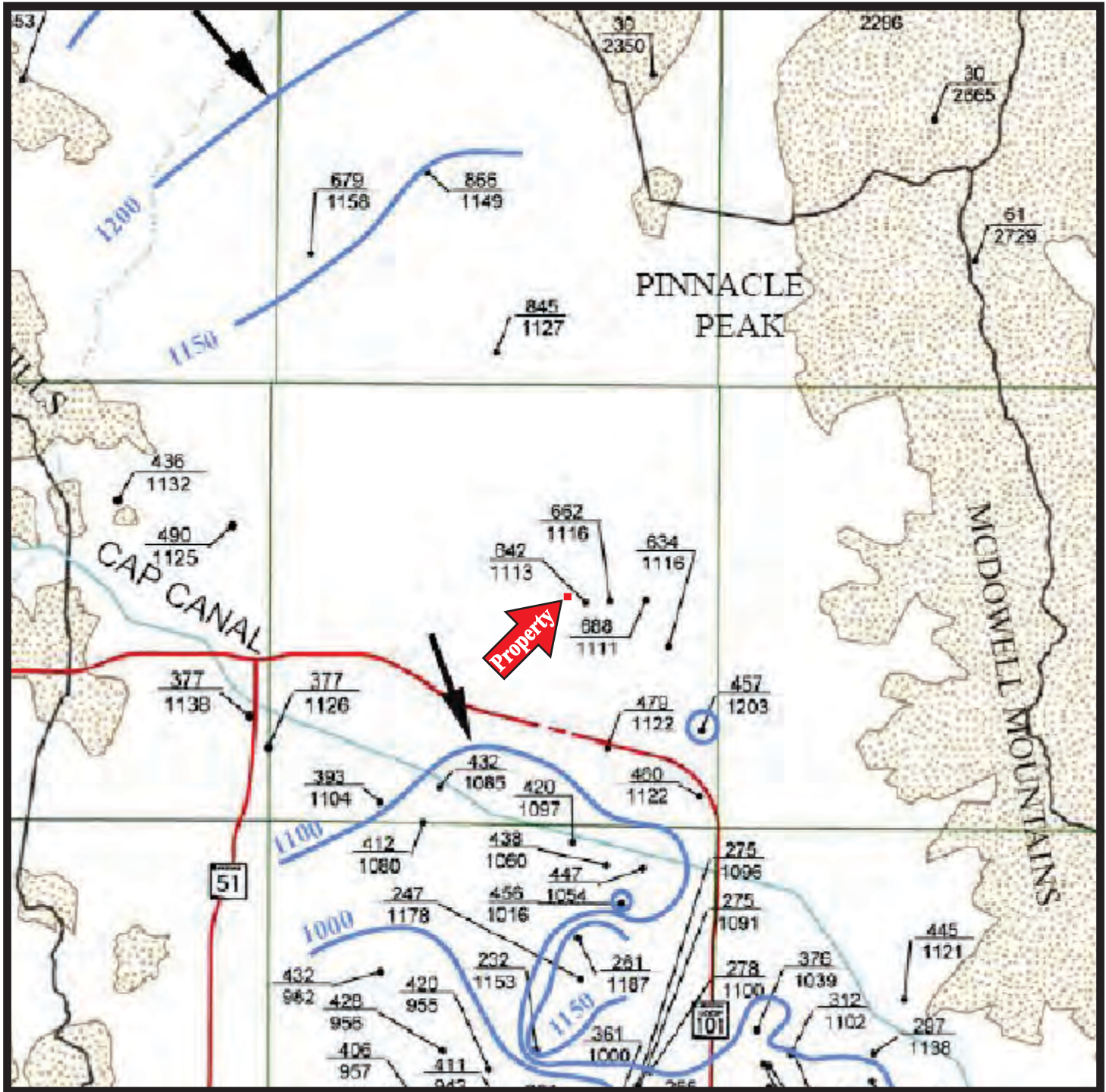
According to FEMA Flood Insurance Rate Map (FIRM) Panel 04013C1320L, dated 10/16/13 and a Letter of Map Revision (LOMR) dated 8/25/17, the west margin of the property (drainage ditch) is in a Zone AO 100-year flood zone while the rest of the property is in Shaded Zone X, which is not a 100-year flood zone, but is a 500-year flood zone. Please refer to the included "FIRMette" extract from the FIRM panel for the extents of these flood zones.

3.0 HISTORY




The property and vicinity history summarized below was developed through review of aerial photographs and USGS maps, as well as interviews by prepared questionnaire with the property owner and user of this ESA. Excerpts from selected historical aerial photographs are reproduced in Section II.

Historical fire insurance maps do not extend to the property.



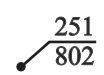


Depth to Water and Altitude of the Water Table

-  Basin Fill Deposits
-  Hard Rock (not water-bearing)
-  Tribal Land

From ADWR Hydrologic Map Series No. 35

 **1050** WATER LEVEL CONTOUR - Approximate altitude of the water table. Contour Interval is 50 feet. Datum is mean sea level.

 **251**
802 WELL - Field checked in 1997-98 and 2002-03
Top number is depth to water in feet.
Bottom number is altitude of the water table in feet above sea level.

 GROUNDWATER FLOW DIRECTION



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Prepared by RW

Scale 1:125,000

National Flood Hazard Layer FIRMeTte



33°41'25.45"N



USGS The National Map: Orthoimagery. Data refreshed October, 2017. 1:6,000 33°40'55.51"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- SPECIAL FLOOD HAZARD AREAS**
 - Without Base Flood Elevation (BFE) Zone A, V, A99
 - With BFE or Depth Zone AE, AO, AH, VE, AR
 - Regulatory Floodway
- OTHER AREAS OF FLOOD HAZARD**
 - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
 - Future Conditions 1% Annual Chance Flood Hazard Zone X
 - Area with Reduced Flood Risk due to Levee. See Notes, Zone X
 - Area with Flood Risk due to Levee Zone D
- OTHER AREAS**
 - NO SCREEN Area of Minimal Flood Hazard Zone X
 - Effective LOMRs
 - Area of Undetermined Flood Hazard Zone D
- GENERAL STRUCTURES**
 - Channel, Culvert, or Storm Sewer
 - Levee, Dike, or Floodwall
- OTHER FEATURES**
 - 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
 - 17.5 Coastal Transect
 - Base Flood Elevation Line (BFE)
 - Limit of Study
 - Jurisdiction Boundary
 - Coastal Transect Baseline
 - Profile Baseline
 - Hydrographic Feature
- MAP PANELS**
 - Digital Data Available
 - No Digital Data Available
 - Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/20/2018 at 4:02:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

3.1 Ownership

According to Assessor online information, the property is owned by FOCHA, LLC. According to the Special Warranty Deed displayed on the Maricopa County Recorder web site, this entity obtained the property from FNBN Properties, LLC on November 7, 2013. No environmental liens, judgments or activity and use limitations are mentioned on the deed.

3.2 User-Provided Information and Interviews

Kris DiNucci completed the Phase I ESA Owner Questionnaire reproduced in Section II on behalf of FOCHA, LLC. These answers lead us not to suspect recognized environmental conditions for the property.

Kelly McKone of 1784 Capital Holdings, LLC completed the Phase I ESA User Questionnaire reproduced in Section II. Mr. McKone's answers lead us not to suspect recognized environmental conditions for the property.

3.3 Historical Property Usage

No features are plotted on the property in the 1906 USGS map. The property is seen to be entirely native desert in the 1953 aerial photograph and remained such until the sidewalk, drainage ditches and segment of Monogram Road were built in 2005. The driveway on the property's east margin was built in 2006. The middle of the property remains native desert. The circular dirt trail on the central and north portions of the property was blazed sometime after February, 2018.

3.4 Historical Adjoining Property Usage

The bordering segment of Scottsdale Road was cut as a dirt road sometime prior to 1953. It was paved by 1961 and has been widened several times.

All adjoining properties are seen to be native desert in aerial photographs dated 1953 through December, 2004. The west adjoining land remains native desert.

The north adjoining Cobblestone Auto Spa was built in phases from 2006 to 2008.

The east and southeast adjoining office/retail buildings were built in 2006.

The south adjoining BMO Harris Bank branch office was built in 2005.

3.5 Prior Environmental Studies

We were not made aware of any prior environmental studies of the property. A prior geotechnical investigation is mentioned in the owner questionnaire.



4.0 SITE RECONNAISSANCE

A site reconnaissance of the property and vicinity was conducted on December 19, 2018 by Randall Whitlock.

The property was walked and adjoining properties were viewed from the property and nearby streets and driveways.

Please refer to the included Site Plan for the locations of described features. Color digital photographs of the property and adjoining properties are included in Section II.

The following observations were made in the course of our site visit:

4.1 Property

The property is bordered on the west by landscaping in the Scottsdale Road right of way. The south margin of the property is the north half (westbound lane) of Monogram Road. The east margin of the property is part of the asphalt-paved driveway of the adjoining Scottsdale Ridge Business Center Condominiums. Part of the property's north boundary is formed by extruded curbing on the adjoining Cobblestone Auto Spa premises.

There is a sidewalk and pipe fence on the north side of Monogram Road. There is a narrow ditch next to a concrete retaining wall immediately north of the sidewalk and fence. There is a curving sidewalk on part of the east margin of the property.

The bulk of the property has a surface of bare soil and native desert vegetation. There is a circular dirt trail that extends south from the middle of the north boundary. The trail has been recently blazed and does not show in the February, 2018 base aerial photograph of our Site Plan.

A few vehicles were seen parked on and west of the trail. This appears to be customer or worker parking related to the adjoining car wash.

No stains, odors, stressed vegetation, suspect debris, or other indications of soil contamination with hazardous substances or petroleum products were physically observed on the property.


Except for some food and drink packages and discarded plant pots, the property is free of trash and debris.

No fill caps, vent pipes, or other evidence of underground storage tanks (USTs) were seen on the property.

No above-ground storage tanks, totes, drums or other containers for hazardous substances or petroleum products were seen on the property.





- Key**
-  Property Boundary
 -  Fence
 -  Dirt Trail

Site Plan

1.438-Acre Property
 for Proposed Storage Facility
 22001 North Scottsdale Road
 Scottsdale, Arizona 85255



1 In = 100 Ft +/-



Yann Engineering, Inc.
 Project 26443
 Prepared by RW

December 19, 2018

Base Map
 Google Earth Image
 Dated February 24, 2018

No subsidence features, pits, sumps, pools of liquid, ponds, lagoons or wastewater discharges were physically observed on the property.

Electricity is available to the property from Arizona Public Service via an overhead distribution line in Scottsdale Road. No transformers or other suspect PCB containing electrical devices were seen on the property.

Drywells are vertical shafts for injection of storm water to the subsurface soils. No drywells were seen on the property.

No water supply wells or groundwater monitoring wells were seen on the property. Domestic water is available to the property from the City of Scottsdale.

No septic system components were seen on the property. Sanitary sewer service is available to the property from the City of Scottsdale. City of Scottsdale sewer manhole covers were seen on the adjoining properties.

4.2 Adjoining Properties

Adjoining properties are as follows:

- North - Cobblestone Auto Spa at 22111 N. Scottsdale Road
- East - Office/retail building within The Scottsdale Ridge Business Center office condominiums at 7267 E. Adobe Drive (Cool Clubs, Premiere Fitness Systems)
- Southeast - Professional office building within Scottsdale Ridge office condominiums at 21819 N. Scottsdale Road (Alba Dental)
- South - BMO Harris Bank branch office at 21911 N. Scottsdale Road
- West - Native desert

The north adjoining Cobblestone Auto Spa includes a lube shop and a Chevron-branded gasoline station. No exterior storage of automotive maintenance fluids was seen in connection with the lube shop. The USTs for the gasoline station, discussed further at §5.7, are located at the north end of the facility, more than 300 feet from the property.

The adjoining properties were not observed to be, and are not suspected to be, used for activities with the potential for recognized environmental conditions at the property.



5.0 REGULATORY AGENCY DATABASE REVIEW

The following databases were reviewed by Randall Whitlock on December 20, 2018. Where available, the internet address of each database is provided as a hyperlink. The date of the most recent update to the database and the ASTM approximate minimum search distance are also provided.

The databases were reviewed directly without using an outside review service. Hence §5.1 through §5.13 constitute the entire documentation of our Regulatory Agency Database Review without the need to reference an appendix or outside report.

The property's ZIP code is 85255. The 85054 ZIP code is within one-half mile. The 85024 ZIP code was historically within one-half mile. There are no other ZIP codes within one mile of the property. The databases referenced below represent the most current information available from EPA and ADEQ.

5.1 EPA National Priorities List (NPL) of CERCLA Superfund Sites

<http://gisweb.azdeq.gov/arcgis/emaps/> (12/18); 1.0 miles

Delisted NPL Sites

<http://gisweb.azdeq.gov/arcgis/emaps/> (12/18); 0.5 miles

The United States Environmental Protection Agency (EPA) publishes the National Priorities List (NPL), which lists federal Superfund sites that pose the greatest risk to human health and the environment due to known contamination with hazardous substances. The areal extents of active NPL sites and delisted NPL sites in Arizona are plotted on the ADEQ Geographic Information System.

There are no NPL sites within one mile of the property.

There are no delisted NPL sites within one-half mile of the property.

5.2 United States Department of Defense Cleanup Sites

<http://gisweb.azdeq.gov/arcgis/emaps/> (12/18); 1.0 miles

The United States Department of Defense (DOD) has accepted responsibility for cleanup of environmental contamination associated with military bases and facilities. The areal extents of most DOD Cleanup sites in Arizona are plotted on the ADEQ Geographic Information System (GIS).

There are no DOD cleanup sites within one mile of the property.

5.3 Arizona Water Quality Assurance Revolving Fund (WQARF) Registry Sites

<http://gisweb.azdeq.gov/arcgis/emaps/> (12/18); 1.0 miles

The Arizona Department of Environmental Quality (ADEQ) Waste Programs Division maintains information on the Water Quality Assurance Revolving Fund (WQARF) Registry



sites. The WQARF program is the state equivalent to the federal Superfund which funds cleanup projects resulting from the release of hazardous substances into the environment. The areal extents of WQARF Registry sites are plotted on the ADEQ GIS.

There are no WQARF Registry sites within one-half mile of the property.

5.4 EPA Superfund Enterprise Management System (SEMS)

<http://www.epa.gov/superfund/superfund-data-and-reports>

List 8R-Active Site Inventory (CERCLIS) (8/13/18); 0.5 miles

List 8R-Archived Site Inventory (NFRAP) (8/13/18); 0.5 miles

State Hazardous Waste Sites

<http://www.azdeq.gov/hazardous-waste-sites> (12/11/18); 0.5 miles

For many years, EPA has maintained the Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS), a database of hazardous waste sites under investigation or previously investigated for possible inclusion on the NPL due to known or suspected soil or groundwater contamination. EPA has also maintained the CERCLA No Further Remedial Action Planned (NFRAP) list, an archive database of sites previously investigated under CERCLA for which no further investigation or remediation is proposed. The CERCLIS and NFRAP databases were reformatted in 2014 and 2015 to become part of the EPA Superfund Enterprise Management System (SEMS) and can be downloaded from the URL given above.

ADEQ publishes an online list of hazardous waste cleanup sites with State of Arizona involvement at the URL given above. This list overlaps significantly with the federal SEMS lists.

There are no CERCLIS, NFRAP or State Hazardous Waste sites within one-half mile of the property.

5.5 Arizona Superfund Programs (ASP) List

<http://legacy.azdeq.gov/environ/waste/sps/download/aspl.pdf> (8/25/04); 0.5 miles

The ASP list consists of remediation sites within the jurisdiction of the ADEQ Superfund Programs. The ASP list is the state equivalent of the CERCLIS database and includes WQARF Registry sites, potential WQARF Registry sites, NPL sites, DOD sites requiring ADEQ oversight, and voluntary cleanup sites under ADEQ oversight. The ASP list is updated only when state and federal superfund cleanup sites are added to or removed from the registry and has not been modified for more than thirteen years. The function of the ASP list has been largely assumed by data layers within the ADEQ GIS system, discussed above, and information pages for individual superfund sites on the ADEQ web site.

There are no ASP sites within one-half mile of the property.



5.6 EPA Brownfields-Cleanups Search

<http://www2.epa.gov/enviro/topic-searches#facility> (Queried 12/20/18); 0.5 miles
Arizona Brownfields Grant Sites

<http://gisweb.azdeq.gov/arcgis/emaps/> (12/16); 0.5 miles
Arizona Voluntary Remediation Program Sites (1/15/15); 0.5 miles
Active Voluntary Remediation Sites

<http://www.azdeq.gov/node/2322> (10/9/18)

Voluntary Remediation Sites (GIS System – Open and Closed)

<http://www2.epa.gov/enviro/topic-searches#facility> (8/18); 0.5 miles

ADEQ Remediation and DEUR Tracking System (State and Federal Control Registry)

https://legacy.azdeq.gov/databases/deursearch_drupal.html
(Query attempted 12/20/18); property only

Brownfields are sites of soil and groundwater contamination being remediated and reclaimed for commercial use, often with the use of public grants. EPA maintains an online database of brownfields cleanup sites across the nation. ADEQ provides oversight for soil and groundwater cleanup projects on private property and reclamation of brownfield sites under the Arizona Voluntary Remediation Program (VRP). Updates to the VRP database, including closed sites, are available from the ADEQ Records Center and a list of links to activities at active VRP sites is presented on the ADEQ web site. Active VRP sites are also plotted on the ADEQ GIS system. ADEQ also maintains a registry of properties in Arizona which have undergone remediation, completed remediation, or filed a Voluntary Environmental Mitigation Use Restriction (VEMUR) or a Declaration of Environmental Use Restriction (DEUR). Both are recorded activity and use limitations (AUL) required to be filed by a property owner who elects to use an institutional (i.e., administrative) control or engineering (i.e., physical) control as a means to meet remediation goals. (The DEUR replaced the VEMUR on 7/18/00.) The ADEQ Remediation and DEUR Tracking System is a control registry which records federal AUL as well as those administered at the county and state level.

There are no EPA or ADEQ Brownfields sites within one-half mile of the property.

There are no active or closed VRP sites within one-half mile of the property.

The DEUR search engine was down for maintenance at the time of our query. We exchanged e-mails with ADEQ DEUR Coordinator Caitlin Burwell, who indicated there are no DEUR or VEMUR for the property.

5.7 Underground Storage Tanks

<http://gisweb.azdeq.gov/arcgis/emaps/> (Queried 12/20/18);
property and adjoining properties

Leaking Underground Storage Tank Sites

<http://gisweb.azdeq.gov/arcgis/emaps/> (Queried 12/20/18); 0.5 miles



ADEQ maintains databases of facilities with underground storage tanks (USTs) and leaking underground storage tank (LUST) sites. The locations of UST facilities and LUST sites are plotted on the ADEQ Geographic Information System, which is updated daily. Detailed lists of USTs and LUST sites with closure dates are published via the ADEQ web site. These databases are also updated daily and can be searched online at <http://legacy.azdeq.gov/databases/lustsearch.html>.

The property does not appear on the UST list.

One adjoining property appears on the UST list. The north adjoining Cobblestone Auto Spa at 22111 N. Scottsdale Road has three USTs for gasoline sales. The UST system is less than eleven years old and was presumably installed in conformance with the 1998 state and federal standards. The UST basin is more than 300 feet north of the property. Based on this information and because it does not appear on the LUST list, this adjoining UST facility is unlikely to have adversely affected the property.

There is one LUST site within one-half mile of the property. This is plotted as follows on the included Regulator Agency Overview Map:

LUST Site

No.	Facility	Address	Status
1	Atko Building Materials	22255 N. Scottsdale Road	1 file; closed

Closure of a LUST file indicates that investigative and cleanup efforts (where required) have been completed to the satisfaction of ADEQ. Since its file is closed and it is more than one-tenth mile away, it is evident that this LUST site has not adversely affected the property.

5.8 RCRA CORRACTS Facilities

<http://www3.epa.gov/enviro/facts/rcrainfo/search.html> (9/26/18); 1.0 miles

RCRA TSD Facilities

<http://www3.epa.gov/enviro/facts/rcrainfo/search.html> (9/26/18); 0.5 miles

<http://gisweb.azdeq.gov/arcgis/emaps/> (8/18); 0.5 miles

RCRA Generator and Transporter Facilities

<http://www3.epa.gov/enviro/facts/rcrainfo/search.html> (9/26/18);

property and adjoining properties

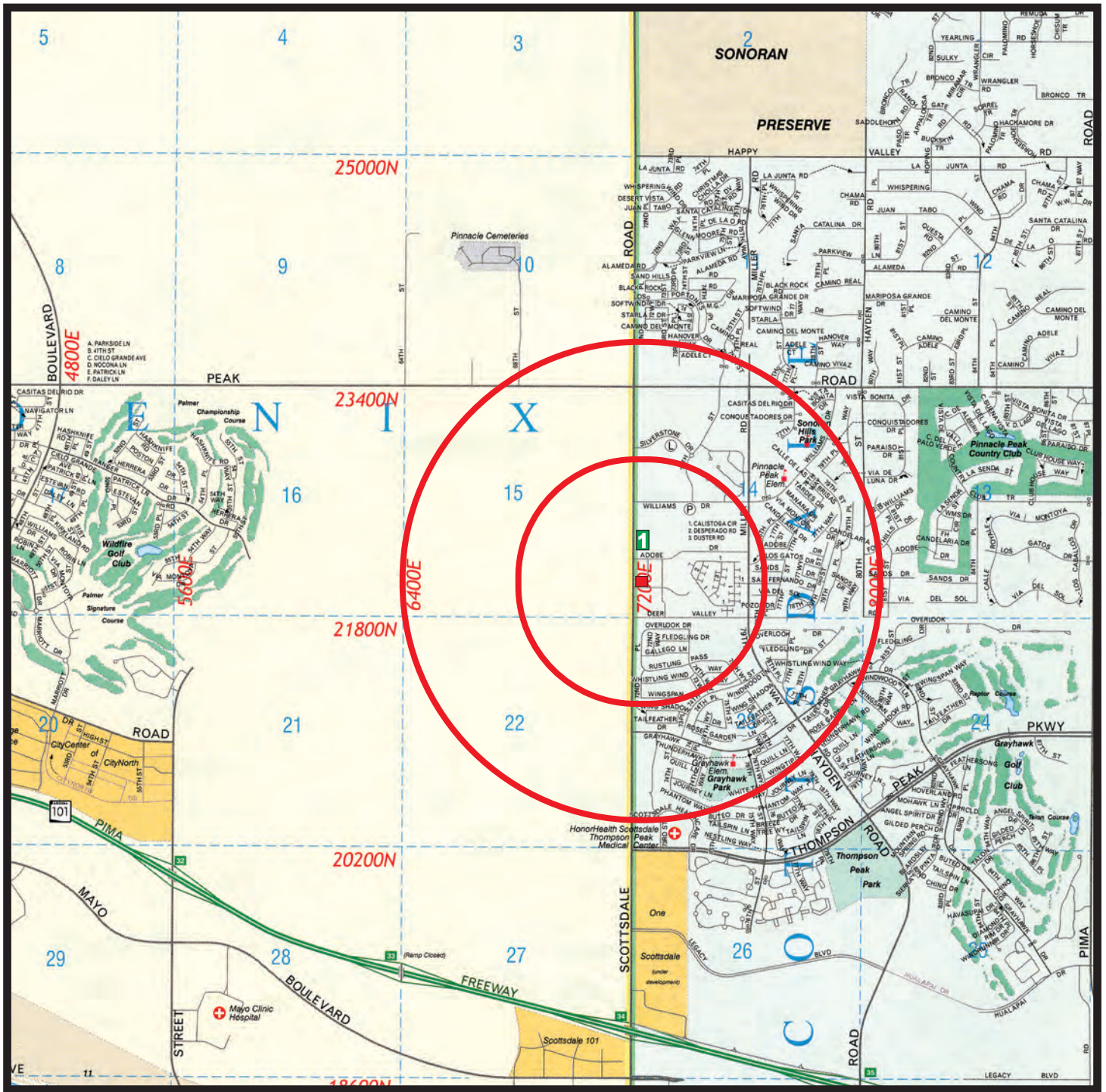
Arizona Notification Verification Report (10/14); property and adjoining properties

Arizona List of Transporters for FOIA (10/14); property and adjoining properties

RCRA Compliance Log (10/14); property and adjoining properties

Under the Resource Conservation Recovery Act (RCRA), EPA maintains a list of facilities involved in the generation, transport, treatment, storage, or disposal of hazardous waste. A database of facilities subject to corrective action under RCRA (CORRACTS facilities), RCRA-registered hazardous waste treatment, storage or disposal (TSD) facilities, and All Handlers was accessed through the EPA online RCRAInfo query utility. ADEQ publishes extracts of the RCRA Information System (RCRIS) database listing Arizona RCRA generator facilities as the Arizona Notification Verification Report, transporter facilities as the Arizona





Regulatory Agency Overview Map



1 Mile Radius
 1/2 Mile Radius



1 LUST Site



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 Project 26443
 Prepared by RW

Prepared from Metropolitan Phoenix Street Atlas
 39th Edition, Wide World Digital

List of Transporters for FOIA, and a list of facilities which have been investigated for RCRA noncompliance as the RCRA Compliance Log. These databases are available for purchase from the ADEQ publications web site.

There are no CORRACTS facilities within one mile of the property.

There are no RCRA-permitted treatment, storage or disposal (TSD) facilities within one-half mile of the property.

The property and adjoining properties do appear as RCRA generators on the Arizona Notification Verification Report or the All Handlers layer of the RCRAInfo web site.

The property and adjoining properties do not appear on the RCRA Transporters List.

The property and adjoining properties do not appear on the RCRA Compliance Log.

5.9 Municipal and Non-Municipal Landfills

<http://gisweb.azdeq.gov/arcgis/emaps/> (3/15); 0.5 miles

Active Non-Municipal Solid Waste Landfills

http://legacy.azdeq.gov/environ/waste/solid/non_municipal.html

(Queried 12/20/18); 0.5 miles

Active Solid Waste Landfills

<http://legacy.azdeq.gov/environ/waste/solid/active.html> (Queried 12/20/18); 0.5 miles

Closed Solid Waste Landfills

http://legacy.azdeq.gov/environ/waste/solid/closed_test.html

(Queried 12/20/18); 0.5 miles

Solid Waste Transfer Stations

<http://gisweb.azdeq.gov/arcgis/emaps/> (4/18); property and adjoining properties

Composting Facilities

<http://gisweb.azdeq.gov/arcgis/emaps/> (8/18); property and adjoining properties

Biohazardous Medical Waste Treatment, Disposal, Transporters, Storage Facilities

http://legacy.azdeq.gov/environ/waste/solid/biohaz_waste.html (Queried 12/20/18);

property and adjoining properties

The ADEQ Geographic Information System includes two data layers with the locations of municipal and non-municipal landfills and layers with active solid waste transfer stations and composting facilities. ADEQ also publishes lists of active and closed solid waste landfills, transfer stations, biohazardous waste facilities and other solid waste facilities which can be queried online.

There are no landfills listed within one-half mile of the property.

There are no solid waste transfer stations, composting facilities, biohazardous waste facilities or other solid waste facilities on the property or adjoining properties.



5.10 Drywell Registration List (ADEQ Megasearch)
<https://megasearch.azdeq.gov/megasearch/>
(Queried 12/20/18); property only

ADEQ maintains a list of registered storm water drywells which is searchable online through its “Megasearch” engine.

The property does not appear on the Drywell Registration List.

5.11 National Response Center, <http://nrc.uscg.mil/>
(9/2/18); property only

The US Coast Guard’s National Response Center (NRC) maintains information about hazardous materials incidents and petroleum releases on behalf of the US Department of Transportation, Environmental Protection Agency, Federal Emergency Management Agency, Department of Energy, Department of Defense, Department of the Interior, Department of Health and Human Services, and Federal Railroad Administration. The NRC databases include and supersede the former EPA Emergency Response Notification System (ERNS). The information is published in the form of spreadsheet files, each representing data from a single year. These are available for download from the NRC at the link given above.

There are no incidents listed on the NRC database for the property.

5.12 Emergency Response Hazardous Materials Incident Logbook (11/15/01)
<http://legacy.azdeq.gov/databases/hwssearch.html>; property only

The ADEQ Emergency Response Unit (ERU) has published a log of hazardous materials incident responses by ADEQ and local fire departments from 1983 through 2001.

The property does not appear in the ERU Logbook.

5.13 Local Agency Contacts; property only

Since the property has never been developed with buildings, property-specific records of the Scottsdale Fire Department would not exist and no contact was made. We are not aware of any other local agency which would have useful environmental information about the property.

6.0 TIER 1 VAPOR ENCROACHMENT SCREEN

Our Phase I ESA was extended to include a Tier 1 Vapor Encroachment Screen (VES) performed in conformance with the scope and limitations of ASTM E2600-15, Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions. The purpose of the VES was to determine if a vapor encroachment condition (VEC) exists at the property.



This Tier 1 VES was performed through a review of historical uses of the property and adjoining properties (see §3.3 through §3.5), observations of the property and adjoining properties during our site reconnaissance (see §4.1 and §4.2) and through a review of the standard environmental record sources (see §5.0 through §5.13).

The property was entirely native desert until 2005 and remains in this condition except for segments of street, driveway and drainage ditches. Significant quantities of chemicals of concern (COC) for VEC have not been stored or used on the property.

Current and past uses of adjoining and nearby properties include offices, a bank branch building and a car wash. These uses have not involved the storage or use of significant amounts of COC for VEC, except for gasoline stored on the north adjoining property. The north adjoining Cobblestone Auto Spa at 22111 N. Scottsdale Road has three USTs for gasoline sales. The UST system is less than eleven years old and was presumably installed in conformance with the 1998 state and federal standards. The UST basin is more than 300 feet north of the property. Based on this information and because it does not appear on the LUST list, this adjoining UST facility is not a source of VEC for the property.

Our review of standard environmental record sources revealed no potential sources of VEC within the Area of Concern (AoC) of one-third mile around the property for non-petroleum COC or one-tenth mile for petroleum COC.

Our Tier 1 VES has revealed that a VEC is unlikely to exist at the property.

7.0 CONCLUSIONS AND RECOMMENDATIONS

We have performed a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of ASTM Practice E1527-13 of the 1.438-acre property at 22001 North Scottsdale Road in Scottsdale, Arizona 85255. Any exceptions to, or deletions from, this practice are described at §1.1 of this report. This ESA was extended to include a Tier 1 Vapor Encroachment Screen performed in conformance with ASTM E2600-15. We understand 1784 Capital Holdings, LLC will purchase the property to build a new storage facility.

This assessment has revealed no evidence of recognized environmental conditions in connection with the property.

Our Tier 1 Vapor Encroachment Screen has revealed that a Vapor Encroachment Condition is unlikely to exist at the property.

We have no recommendations for further investigation of the property.

8.0 REFERENCES

8.1 Location

United States Geological Survey
Currys Corner, Arizona Quadrangle
7.5 Minute Series 1964, Photorevised 1982



Maricopa County Assessor Parcel Map 780-14-03-03

Maricopa County Assessor Parcel Viewer

<http://maps.mcassessor.maricopa.gov/>

8.2 Geology

Geologic Map of Maricopa County, Arizona

Arizona Bureau of Mines, 1957

Cooley, M.E., Map Showing Distribution and Estimated Thickness

of Alluvial Deposits in the Phoenix Area, Arizona

United States Geological Survey Map I-845-C, 1973

Christensen, Gary, Dennis Welsch and Troy Péwé

Geology, McDowell Mountains Area, Maricopa County, Arizona

City of Scottsdale and Arizona State University, 1978

Nations, D. and E. Stump, Geology of Arizona

Kendall-Hunt Publishing, 1981

Kamilli, Robert and Stephen M. Richard, Geologic Highway Map of Arizona

Arizona Geological Society and Arizona Geological Survey, 1998

Arizona Geological Survey Map Services: Geologic Map of Arizona

<http://services.usgin.org/azgs/geologic-map-arizona.html>

United States Geological Survey MapView

<http://ngmdb.usgs.gov/maps/mapview/>

8.3 Hydrology

Rascona, S.J., Maps Showing Groundwater Conditions in the Phoenix AMA

November 2002-February 2003, Hydrologic Map Series Report No. 35

Arizona Department of Water Resources, 2005

Arizona Water Atlas, Volume 8: Active Management Area Planning Area

Arizona Department of Water Resources, April 2010

Arizona Department of Water Resources Well Registry Web Map

<http://gisweb2.azwater.gov/WellReg>

8.4 Surface Water Drainage

FEMA Flood Insurance Rate Map 04013C1320L, 10/16/13

FEMA Flood Map Service Center

<https://msc.fema.gov/portal/home>



8.5 History

United States Geological Survey
Camelsback, Arizona Quadrangle
7.5 Minute Series 1906

Maricopa County Historical Aerial Photography
<http://gis.maricopa.gov/MapApp/GIO/AerialHistorical/index.html>
Aerial Photographs Dated:

4/6/53	1961	1/2/69	3/9/76	12/15/79
11/21/86	1991	1/21/93	12/3/96	12/13/98
1/29/00	1/4/01	12/19/01	2002	12/4/02
12/11/03	12/2/04	1/9/06	11/3/06	5/07
6/4/07	10/23/07	4/08	11/10/08	5/09
10/21/09	6/8/10	9/29/10	9/29/11	10/13/12
9/25/13	10/3/14	12/12/15	10/13/16	Fall 2017

United States Geological Survey
Currys Corner, Arizona Quadrangle
7.5 Minute Series, Dated:

1964	1973	1982	2009	2011
2014				

Historical Aerials by NETR Online, <http://www.historicaerials.com>
Aerial Photographs Dated:

1957	1962	1980	1988	1990
1993	1997	1998	1999	2002
2004	2007	2010	2013	

United States Geological Survey
Currys Corner, Arizona Orthophotoquad, 1971

Google Earth, Aerial Photograph Dated 2/24/18

8.6 Contacts

Kelly McKone, 1784 Capital Holdings, LLC (480.250.0284)
Kris DiNucci, FOCHA, LLC (vavygroup@gmail.com)

9.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

We hereby certify that Vann Engineering, Inc. (www.vannengineeringinc.com), formerly known as Foree & Vann, Inc., is capable of and experienced in performing Phase I Environmental Site Assessments, and has been performing Phase I Environmental Site Assessments or the equivalent in this locality since 1986.

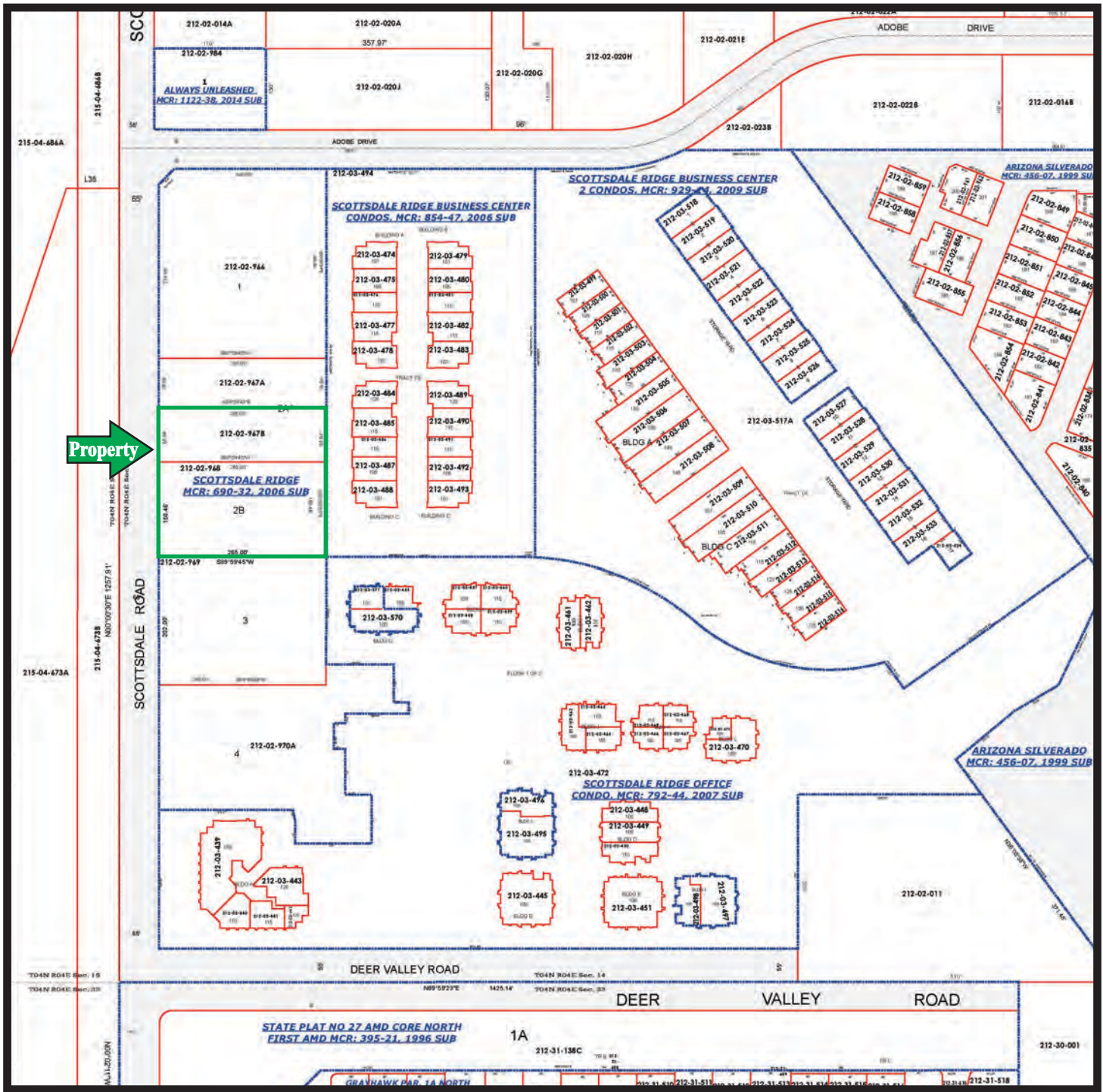


This assessment was completed by Project Geologist Randall Whitlock, who has a Master of Science degree in Geology and is a Registered Geologist in the state of Arizona (Certificate No. 30447). Mr. Whitlock has completed more than two thousand Phase I Environmental Site Assessments and other environmental studies since 1991.

The report was reviewed by Environmental Services Department Manager Stanley G. O'Sick, who has a Bachelor of Science in Engineering degree, an Associate of Science degree in chemistry, and is a Registered Professional Engineer (Civil) in the state of Arizona (Certificate No. 26867). Mr. O'Sick has prepared and reviewed Phase I Environmental Site Assessments since 1990.



SECTION II



Plat Map

SW4 SW4 Section 14, T4N R4E



Vann Engineering, Inc.
 Project 26443
 Prepared by RW

Prepared from Maricopa
 County Assessor's Map
 780-14-03-03

PHASE I ESA OWNER QUESTIONNAIRE
(Based on All Appropriate Inquiry and ASTM E1527-13)

The following questions are for the property owner, owner's representative or other **Key Site Manager**.

1. Are you aware of any uses or conditions, past or present, which may have resulted in contamination of the soils or groundwater of the property with hazardous substances or petroleum products?

Yes No Do Not Know

2. Are you aware of any pending, threatened, or past litigation, administrative proceedings, or notices from any governmental entity regarding hazardous substances or petroleum products in, on or from the property?

Yes No Do Not Know

3. Are you aware of any permits, registrations, or reports (prior ESA, soils report, hydrology study, risk assessment, etc.) on the property?

Yes No Do Not Know

Comments:

2014 GEOTECHNICAL EVAL REPORT

Owner or Key Site Manager (Printed Name and Entity)

Ken Jones

Owner or Key Site Manager (Signature)

[Handwritten Signature]

Date

12/26/18

**PHASE I ESA USER QUESTIONNAIRE
(Based on All Appropriate Inquiry and ASTM E1527-13)**

In order to qualify for one of the Landowner Liability Protections (LLPs)* offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the "Brownfields Amendments"),** the User must provide the following information (if available) to the environmental professional. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete.

1. Environmental cleanup liens that are filed or recorded against the property (40 CFR 312.25).

Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law?

___ Yes No ___ Do Not Know

2. Activity and land use limitations (AULs) that are in place on the property or have that been filed or recorded in a registry (40 CFR 312.26).

Are you aware of any activity and use limitations (AULs), such as engineering controls, land use restrictions or institutional controls (such as VEMUR or DEUR) that are in place at the property and/or have been filed or recorded in a registry under federal, tribal, state or local law?

___ Yes No ___ Do Not Know

3. Specialized knowledge or experience of the person seeking to qualify for the LLP (40 CFR 312.28).

As the user of this ESA do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?

___ Yes No ___ Do Not Know

4. Relationship of the purchase price to the fair market value of the property if it were not contaminated (40 CFR 312.29).

Does the purchase price being paid for the property reasonably reflect the fair market value of the property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property?

Yes ___ No ___ Do Not Know

5. Commonly known or reasonably ascertainable information about the property (40 CFR 312.30).
Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases?

For example, as User:

a) Do you know the past uses of the property?
 Yes No Do Not Know

b) Do you know of specific chemicals that are present or once were present at the property?
 Yes No Do Not Know

c) Do you know of spills or other chemical releases that have taken place at the property?
 Yes No Do Not Know

d) Do you know of any environmental cleanups that have taken place at the property?
 Yes No Do Not Know

6. The degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).

As the User of this ESA, based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of contamination at the property?

Yes No Do Not Know

In addition, certain information should be collected, if available, and provided to the environmental professional selected to conduct the Phase I. This information is intended to assist the environmental professional but is not necessarily required to qualify for one of the LLPs. The information includes:

- the reason why the Phase I is required,
- the type of property and type of property transaction, for example, sale, purchase, exchange, and so forth,
- the complete and correct address for the property (a map or other documentation showing property location and boundaries is helpful),
- the scope of services desired for the Phase I (including whether any parties to the property transaction may have a required standard scope of services or whether any considerations beyond the requirements of Practice E1527 are to be considered),
- identification of all parties who will rely on the Phase I report,
- identification of the property contact and how the contact can be reached,
- any special terms and conditions which must be agreed upon by the environmental professional,
- any other knowledge or experience with the property that may be pertinent to the environmental professional (for example, copies of any available prior environmental site assessment reports, documents, correspondence, and so forth, concerning the property and its environmental condition).

User (Printed Name and Entity) Kelly McKone 1784 Capital Holdings

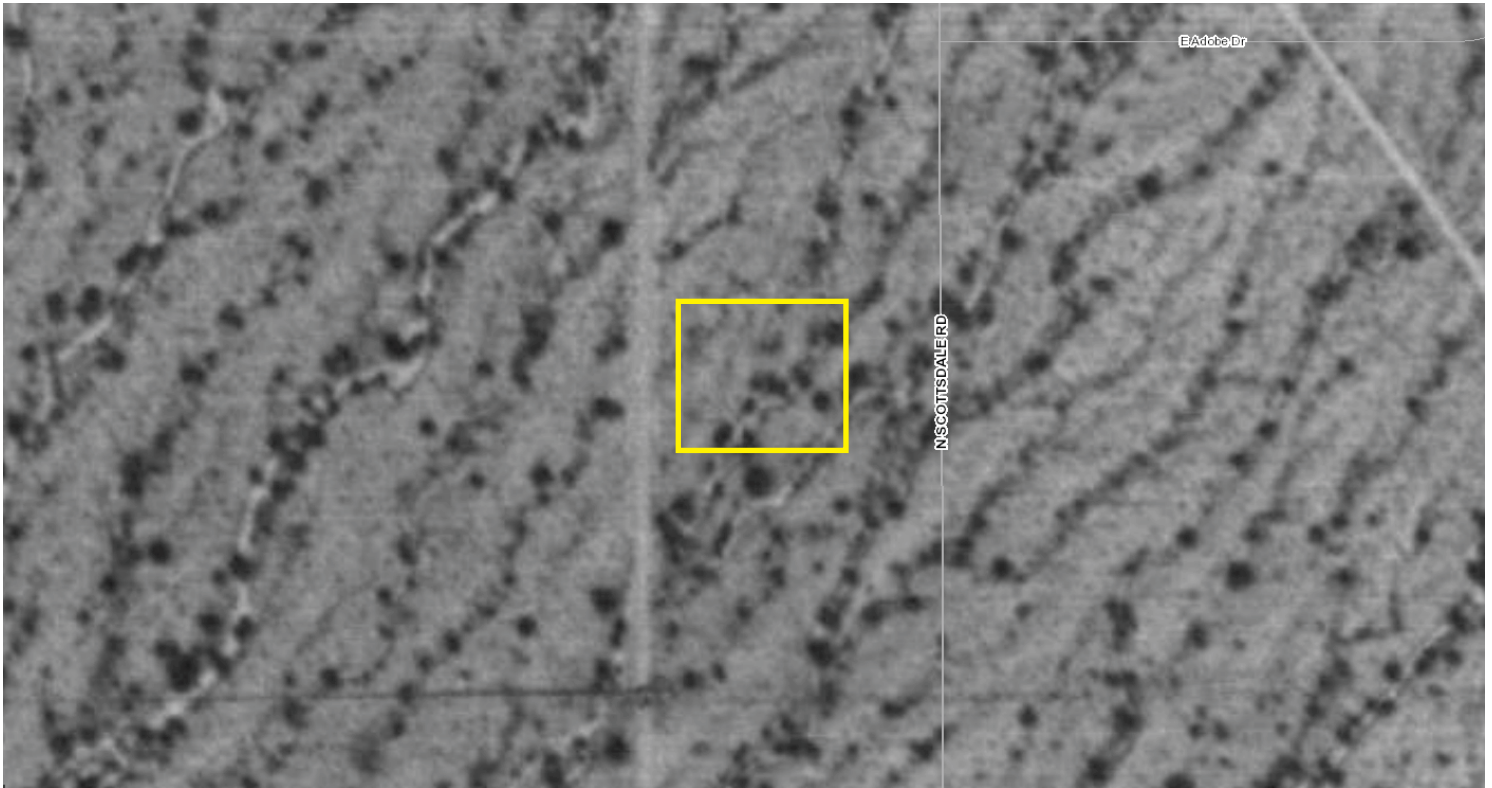
User (Signature) [Signature]

Date 12/20/18

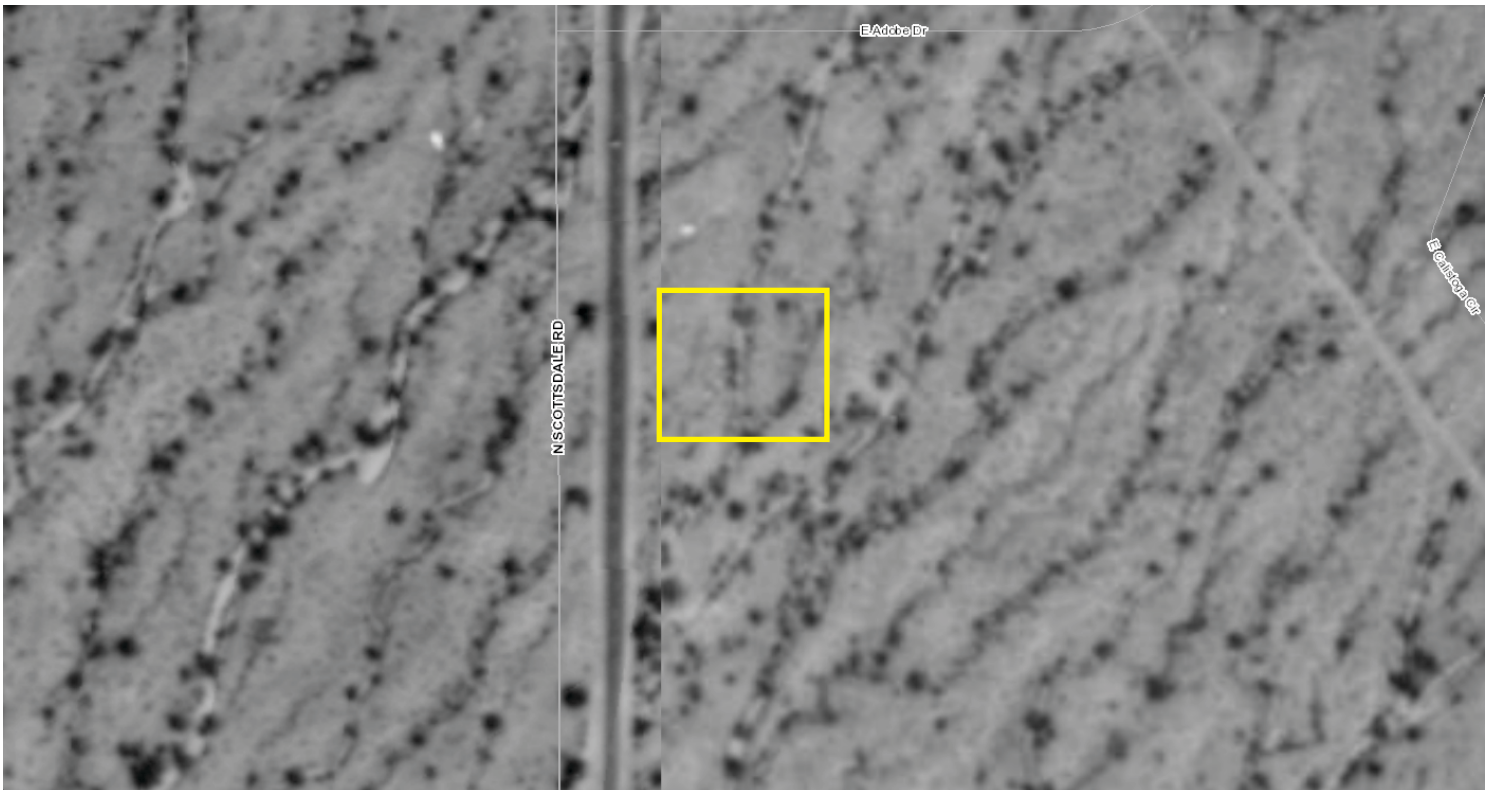
*Landowner Liability Protections, or LLPs, is the term used to describe the three types of potential defenses to Superfund liability in EPA's Interim Guidance Regarding Criteria Landowners Must Meet in Order to Qualify for Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner Limitations on CERCLA Liability ("Common Elements" Guide) issued on March 6, 2003.

**P.L. 107-118.

Historical Aerial Photographs



Maricopa County Historical Aerial Photography 4/6/53



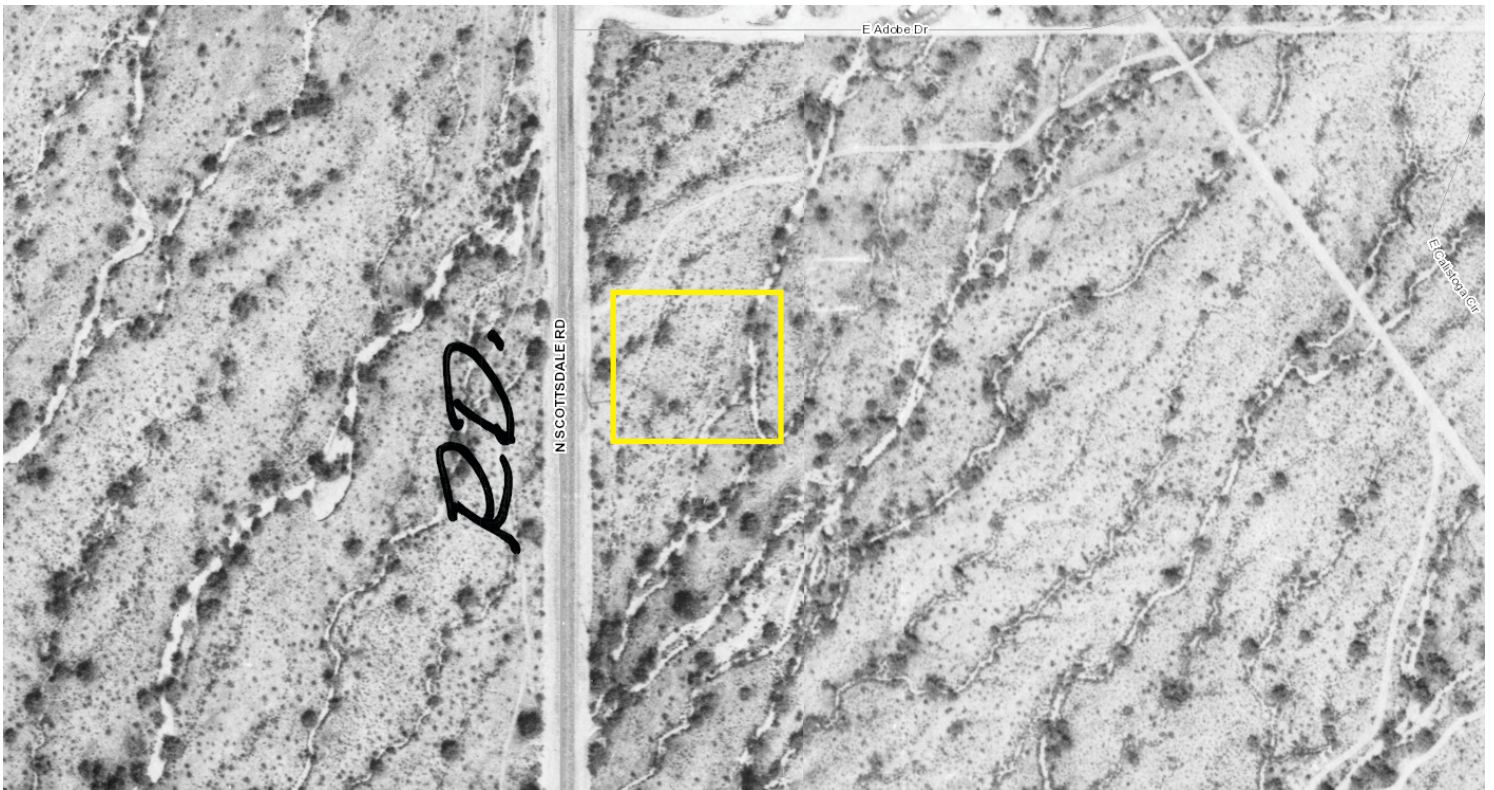
Maricopa County Historical Aerial Photography 1961



Historical Aerial Photographs



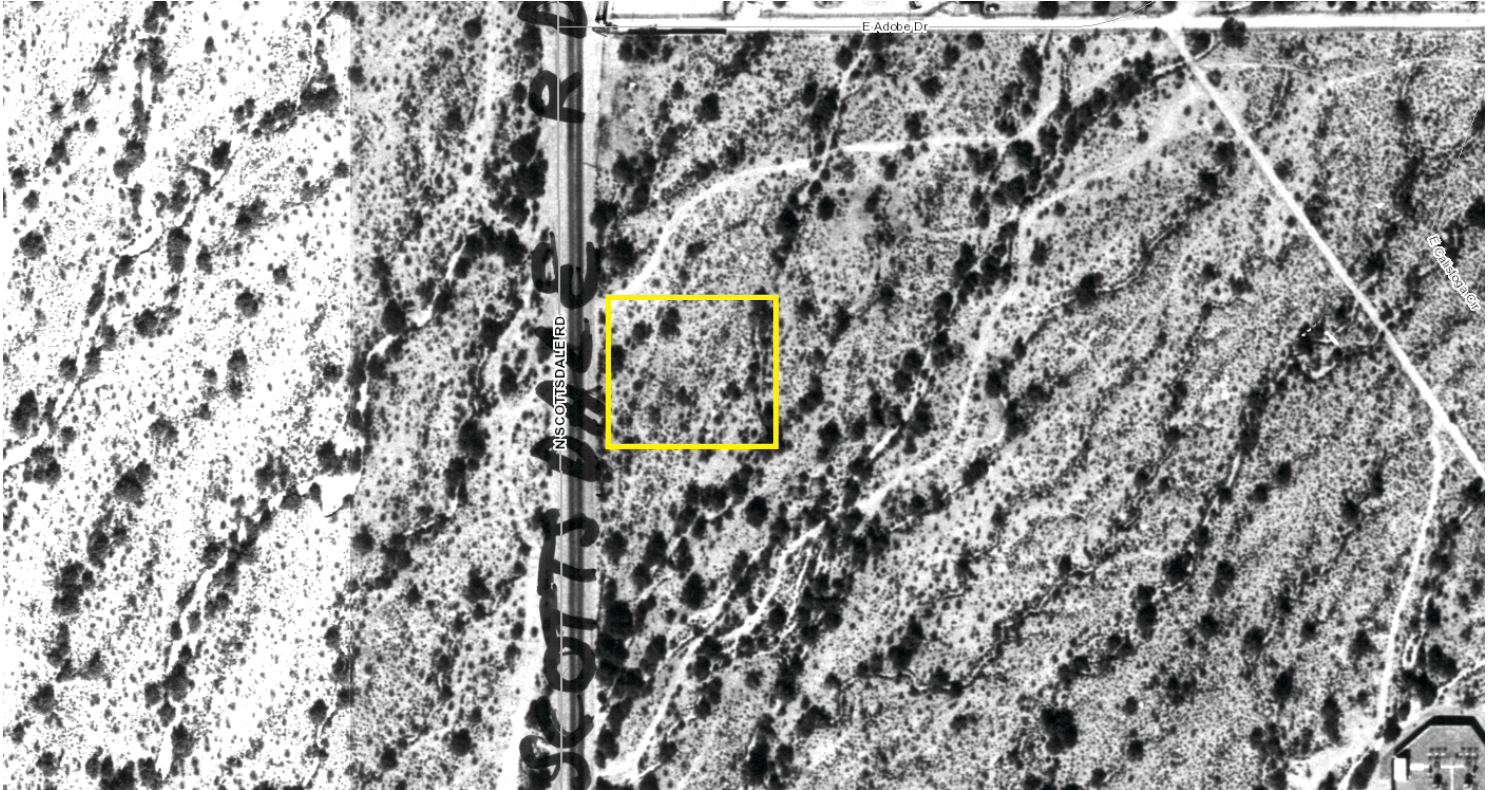
Maricopa County Historical Aerial Photography 1/2/69



Maricopa County Historical Aerial Photography 3/9/76



Historical Aerial Photographs



Maricopa County Historical Aerial Photography 11/21/86



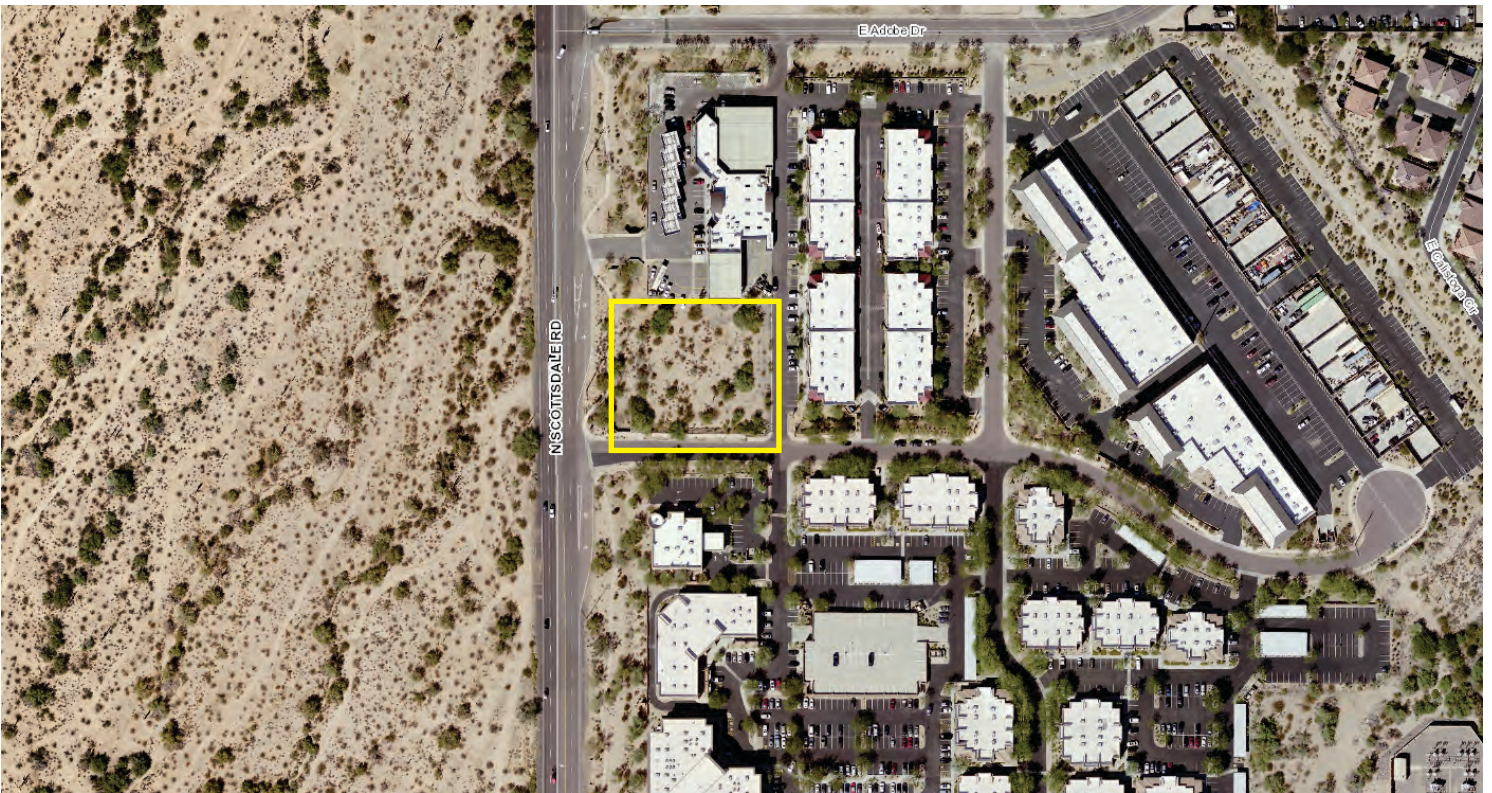
Maricopa County Historical Aerial Photography 12/3/96



Historical Aerial Photographs



Maricopa County Historical Aerial Photography 1/9/06



Maricopa County Historical Aerial Photography 10/13/16





Photos 1, 2 - View of the property, looking north and northeast across Monogram Road.



Photos 3, 4, 5 - View of the property, looking east, southeast and south from its northwest corner.



Photos 6, 7, 8 - View of the property, looking south, southwest and west from its northeast corner.





Photos 9, 10, 11 - View of the property, looking west, northwest and north from its southeast corner.



Photo 12 - View of the property, looking northwest across Monogram Road and the east bordering driveway.



Photo 13 - View of the ring-shaped dirt trail on the northwest portion of the property, looking northwest.



Photo 14 - View of the north adjoining Cobblestone Auto Spa, looking northwest from its southeast corner.



Photo 15 - View of the east adjoining office/retail building, looking northeast across its driveway.





Photo 16 - View of the southeast adjoining Alba Dental building, looking east across its driveway.



Photo 17 - View of the south adjoining BMO Harris Bank branch office, looking west across its driveway.



Photo 18 - View of the west adjoining native desert land, looking northwest across Scottsdale Road.

