Safety

- NextEra Energy Resources storage facilities include both on-site and off-site monitoring systems, as well as fire detection systems that meet or exceed industry standards
- NextEra Energy Resources has a 24/7 control center in Florida that monitors and can control all our assets remotely
- We work and train with local first responders and fire officials to coordinate any response, in the unlikely event of a fire
- We comply with all local, state and federal regulations in terms of operations and disposal of storage materials

NEXTera® ENERGY RESOURCES



Energy Storage Components

A battery energy storage system typically includes the following components:

» Individual battery cells (often the size of an iPad)

» These cells are put into battery modules and stacked on racks

» The racks fill containers, not unlike a storage container you'd see on a ship or truck

» The containers are paired with inverters to convert DC-AC electricity

» The system includes HVAC to maintain temperature control

» Can be paired with a renewable energy asset (solar, wind) or stand alone

NEXTera® ENERGY RESOURCES



Benefits

Energy storage delivers several advantages to the power grid and our customers. What makes energy storage attractive is that it can store electricity and deliver it later at a more appropriate time, in the required amount, to either grid operators or direct consumers.

Storage helps optimize the way the power grid delivers electricity to customers with a wide variety of use cases:

» Smooths out fluctuations in frequency and voltage

» Replacing traditional peaking generation units

» Reduces energy losses and waste

» Avoids the need for some system upgrades, including big transmission projects

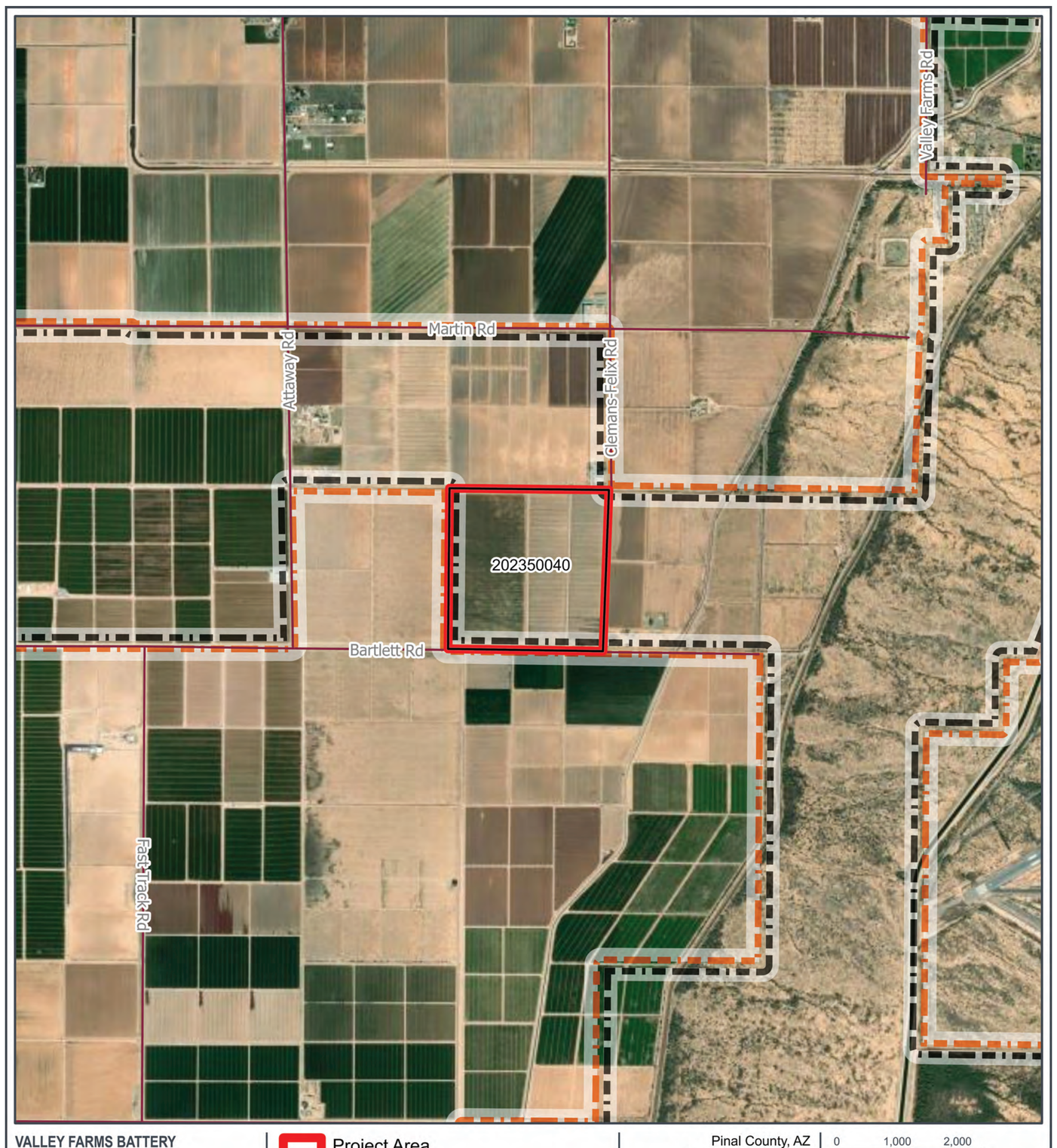
» Extends the hours a renewable energy project can operate, i.e., even after the sun goes down or the wind stops blowing

» Allows customers to enjoy more renewable energy, more hours of the day

NEXTera® ENERGY RESOURCES



Project Area



VALLEY FARMS BATTERY ENERGY STORAGE SYSTEM PROJECT

Project Parcels

SWCA ENVIRONMENTAL CONSULTANTS

Project Area

Project Parcels

Jurisdiction

City of Coolidge

Unincorporated Pinal County

Pinal County, AZ
USGS 7.5' Quadrangle:
Valley Farms, AZ, 32111-H4
T5S R9E Sec 31
NAD 1983 UTM Zone 12N
111.4597°W 32.9482°N

Base Map: ESRI ArcGIS Online, accessed February 2024

0 1,000 2,000 Feet
0 340 680 Meters

1:32,000

N

Updated: 2/21/2024
Project No. 64841
File:64841 Project Parcels 20231122

NEXTera ENERGY RESOURCES

Project Overview

- Located in unincorporated Pinal County, Arizona and adjacent to the City of Coolidge
- Accessible by E Bartlett Road and N Clemans Road
- A 400 MW standalone battery energy storage system
- 160 acres on a single privately owned parcel
- Coordinating with Pinal County to determine land use designation requirements, which could include the need for a Comprehensive Plan Amendment
- A Zone Change and Planned Area Development (PAD) Overlay District is being requested to change the zoning district from General Rural (GR) to Industrial Zoning with a PAD Overlay District
- The PAD Overlay District would restrict the Industrial Zoning District to only allow for battery energy storage systems and associated facilities
- If the Zone Change and PAD Overlay District is approved, other local permits will be pursued for the Project

NEXTera ENERGY RESOURCES

Contact Us

Ashley Johnson

(561) 313-9534

ValleyFarmsEnergyStorage@nexteraenergy.com

24-Hour Media Line

(561) 694-4442

media.relations@nexteraenergyresources.com

Comment cards are available in this meeting

NEXTera ENERGY RESOURCES

ATTACHMENT D

Neighborhood Meeting Supporting Materials

NextEraEnergyResources.com

Affordable, homegrown energy for Arizona



Wilmot Renewable Energy Facility in Pima County

» NextEra Energy Resources' subsidiaries began in 2012 to help fuel the state's economic growth and quality of life, and move our country toward energy independence.

» Our subsidiaries own and operate two wind and two utility-scale solar facilities, one energy storage site and a portfolio of distributed energy resources in the state. We also have several projects in development.

» Arizona's interest in solar energy is growing, and the state is now ranked fifth in installed solar capacity, according to the Solar Energy Industries Association. NextEra Energy Resources plays a role in the state's clean energy future through operations at its wind and solar generating facilities.

NextEra Energy Resources' assets in Arizona

2 wind energy centers in operation

1 wind project in construction

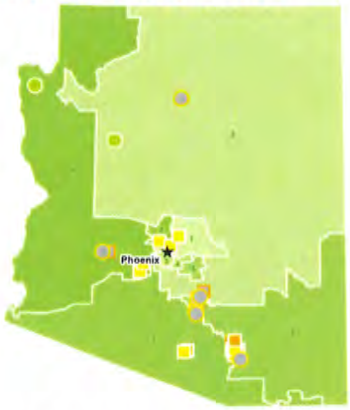
1 battery energy storage site in operation

7 battery energy storage projects in development

5 utility-scale solar energy centers in operation

5 utility-scale solar projects in development

32 distributed energy resources in operation



*Some symbols represent more than one asset.

Legend: Wind · Utility-Scale Solar · Distributed Energy Resources · Battery Energy Storage · Development/Construction

About NextEra Energy Resources

» The world's largest generator of renewable energy from the wind and the sun.

» A leading energy provider, operating wind, natural gas, solar and nuclear power plants, as well as battery energy storage.

» Nearly all of the electricity we generate comes from clean or renewable sources.

» A subsidiary of NextEra Energy, Inc., with headquarters in Juno Beach, Florida.

Benefits of our energy investments in Arizona

Approximately
$1.5 billion
total capital investment

Approximately
$7.1 million
annual payroll

$4.9 million
annual land payments

$4.3 million
in property taxes, 2022*

*** Annual Property Taxes:** Includes property tax and other indirect taxes. Internal data based on 2022 full year.

Solar energy is cost competitive*

During the last 10 years, the cost of solar energy has **decreased more than**

80%

** Source: Solar Energy Industries Association*

NEXTera ENERGY RESOURCES

NextEra Energy Resources' Arizona Wind Energy Centers

Name	County	Turbines	MW
Perrin Ranch	Coconino	62	99.2**
White Hills	Mohave	126	349.6
Babbitt Ranch (construction)	Coconino	Up to 53	Up to 161

NextEra Energy Resources' Arizona Utility-Scale Solar Energy Centers

Name	County	MW
Belmont (development)	Maricopa	450
Eloy Valley (development)	Pinal	400
Eloy Valley III (development)	Pinal	400
Pinal Central	Pinal	20
Saint	Pinal	100**
Selma (development)	Pinal	150
Sonoran	Pinal	Up to 260
Storey	Pinal	Up to 88
Wilmot	Pima	100**
Willmot II (development)	Pima	130

NextEra Energy Resources' Arizona Distributed Energy Resources

Name	County	MW
Sunnyside Unified School District	Pima	7.4
Various	Maricopa, Pima	7.19

NextEra Energy Resources' Arizona Battery Energy Storage Systems

Name	County	MW
Belmont (development)	Maricopa	450
Eloy Valley (development)	Pinal	400
Eloy Valley III (development)	Pinal	400
Estrella (development)	Maricopa	75
Saint (construction)	Pinal	100
Selma (development)	Pinal	150
Sonoran (construction)	Pinal	Up to 260
Storey (construction)	Pinal	Up to 88
Valley Farms (development)	Pinal	350
Wilmot	Pima	30**
Willmot II (development)	Pima	130

***Includes megawatts associated with noncontrolling interests related to NextEra Energy Partners, LP.*

For more information, please visit NextEraEnergyResources.com

Updated December 2023



Energy Storage Overview

- Capacity of up to 400 megawatts (MW) and a 4-hour duration
- Located in Pinal County, Arizona
- Expected to begin commercial operation in 2027
- Owned and operated by a subsidiary of NextEra Energy Resources

Energy Storage Benefits

- Will generate approximately $60 million in additional tax revenue over the life of the project to benefit Pinal County
- Create approximately 50 construction jobs
  Batteries store energy, releasing it to customers when most needed
- Provides energy for about 100,000 homes for 4-hours, reducing risk of grid black-outs
- Supports economy through purchases of regional goods and services
- Creates no air or water pollution and uses no water to store electricity
- Enables renewable energy sources to supply more energy to the grid

About NextEra Energy Resources

» A leading clean energy provider operating wind, natural gas, solar and nuclear power plants

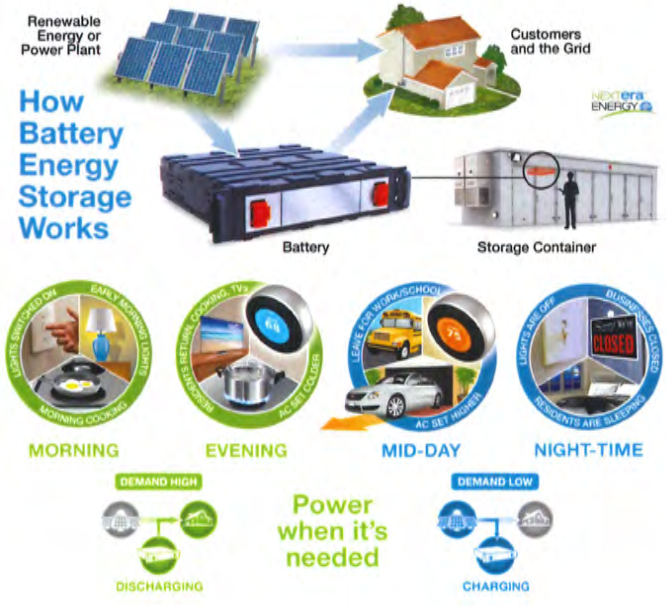
» A portfolio of power generating facilities across the United States and in Canada

» The world's largest generator of wind and solar energy

» A subsidiary of NextEra Energy, Inc., with headquarters in Juno Beach, Florida

» Nearly all of the electricity we generate comes from clean or renewable sources

NextEraEnergyResources.com



NEXTera ENERGY RESOURCES

NextEraEnergyResources.com



Providing Energy Solutions

We have the resources, skills and expertise to help customers achieve business and sustainability goals.

The Wheatridge Renewable Energy Center in Morrow County, Oregon is the first large-scale energy facility in North America to combine wind, solar and battery storage at a single location.

NextEra Energy Resources, LLC, is committed to providing energy-related products and services that grow our economy, protect the environment and support our communities. NextEra Energy Resources is the world's largest generator of renewable energy from the wind and sun, a world leader in battery storage and is driving the development of the green hydrogen economy. Nearly all of our electricity comes from clean or renewable resources, including wind, solar, natural gas and nuclear energy facilities that are located in 40 states and Canada. Our success reflects the solid business practices of our parent company, NextEra Energy, Inc., a Fortune 200 company and one of the nation's leading clean energy companies.

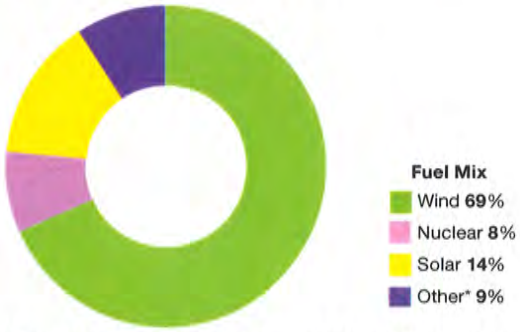
Offering a diversified portfolio of fuel sources

NextEra Energy Resources has a portfolio of power-generating facilities, with approximately 27,400 megawatts (MW) of total net generating capacity in the U.S. and Canada. This includes wind, solar, natural gas and nuclear energy resources.

We are primarily a wholesale power generator, operating power plants and selling the output to utilities, retail electricity providers, power cooperatives, municipal electric providers and large industrial companies.

A diversified portfolio at NextEra Energy Resources

Total Net MW[1]: 27,400[2] | As of Dec. 31, 2022



1) Includes MW associated with noncontrolling interests related to NextEra Energy Partners, LP.
2) This figure reflects MW associated with long-term contracted generation.
3) Primarily natural gas.

Helping drive the decarbonization of the U.S. economy

NextEra Energy Resources offers a suite of comprehensive clean energy solutions, transmission expertise and best-in-class renewable and storage development platforms, which uniquely positions us to help lead the decarbonization of the U.S. economy. Leveraging our considerable scale and expertise will help the power sector and commercial and industrial customers transition to zero carbon emissions.

NEXTera ENERGY RESOURCES

NextEraEnergyResources.com

Bringing experience in renewable energy

NextEra Energy Resources has been involved in clean energy development since the 1980s and has invested nearly $40 billion in wind, solar and battery storage since 2012. We have earned a reputation for excellence and experience in developing, constructing and operating wind, solar and battery storage projects across North America.

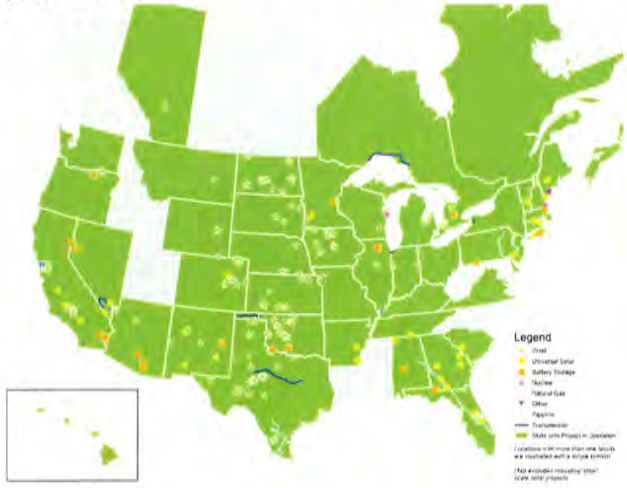
- **Wind energy.** We own and operate more than 150 wind facilities in 22 states and Canada. We operate more than 12,000 wind turbines that are capable of generating enough electricity to power millions of homes.
- **Solar energy.** We operate dozens of universal and small-scale solar projects in 30 states across the U.S.
- **Battery energy storage.** We are a leader in the energy storage market. We have operational energy storage and a pipeline of development projects across the U.S. and Canada.

Providing other energy services to customers

NextEra Energy Resources has a number of energy-related businesses that help customers meet their energy needs. These include:

- **Small-scale solar generation.** We provide custom-tailored solutions that allow customers to generate clean, reliable energy from their rooftops, parking structures and open land.

NextEra Energy Resources Generation Facilities
(As of 12/31/22)



*Only universal-scale solar



Top: Borderlands Wind; Bottom: Point Beach Solar

- **Energy marketing.** NextEra Energy Marketing (NEM), LLC, is one of the top five marketers of power in the nation. NEM provides custom energy solutions for customers with specific needs.
- **Retail market.** NextEra Energy Services and Gexa Energy serve customers in numerous U.S. retail markets.
- **NextEra Analytics.** This subsidiary provides renewable energy consulting services using industry-leading scientific analysis for planning, siting and forecasting renewable energy projects.

Building partnerships across North America

Renewable energy projects represent a clean, cost-effective option to meet customers' energy needs. Across North America, NextEra Energy Resources is building strong partnerships with companies that are buying wind and solar-generated electricity to provide to residential and commercial markets throughout their service areas. Many electric utilities, cooperatives and municipalities have joined with our company in providing this clean, renewable power to their customers.

Operating in harmony with the environment

NextEra Energy Resources promotes the generation of clean energy through the use of clean-burning fuels or renewable resources. We also incorporate environmental stewardship into the design, construction, operation and maintenance of our facilities. Through our commitment, we are working to ensure that the growing demand for power is met in the most environmentally responsible manner.

113128

ATTACHMENT E

Neighborhood Meeting Sign-In Sheet

Valley Farms Energy Storage project
Feb. 29, 2024

Open house sign-in sheet

Please write legibly

NEXTera ENERGY RESOURCES

Full Name	Email Address	Telephone	Want to receive project updates?*
Carrie Gremard	[redacted]		Yes
Ronald Gremard			Yes
Debie Needy			No
Tom Scott			

*By providing your information, you agree NextEra Energy Resources may contact you at the number you provided above with information about the project in the future. We will not share your information with any 3rd party sources.

Valley Farms Energy Storage project
Feb. 29, 2024

Open house sign-in sheet

Please write legibly

NEXTera ENERGY RESOURCES

Full Name	Email Address	Telephone	Want to receive project updates?*
Timothy Johnston	[redacted]		
Taylor Randall			Yes
Lindsey Randall			Yes
KENNETH BOLAN			Yes
Nicholas Bauer			
Eric Hill			Yes
Gilbert Lopez			yes

*By providing your information, you agree NextEra Energy Resources may contact you at the number you provided above with information about the project in the future. We will not share your information with any 3rd party sources.

Valley Farms Energy Storage project
Feb. 29, 2024

Open house sign-in sheet

Please write legibly

NEXTera ENERGY RESOURCES

Full Name	Email Address	Telephone	Want to receive project updates?*
Jacque Henry	[redacted]		
Tom Shope			
Michael D Vigil			Yes -
Dawn Jennings			Yes
Jerry Nevan			
Rebecca Walker			
PATRICIA DIXON			Yes
Pam Johnston			

*By providing your information, you agree NextEra Energy Resources may contact you at the number you provided above with information about the project in the future. We will not share your information with any 3rd party sources.

ATTACHMENT F

Neighborhood Meeting Written Comments

NEXTera ENERGY RESOURCES

Comment Form

NextEra Energy Resources
Valley Farms Energy Storage project
Neighborhood meeting
Thursday, Feb. 29, 2024
6:30-8:30 p.m.

Name: Taylor and Lindsey Randall

Organization (*if applicable*):

[redacted]

Comment(s):

As residents of Coolidge, and property owners very near the project site, we would like to say that we oppose the project in question. We have worked hard to purchase land that will allow our children to grow in a rural setting. We love our beautiful farm landscape around our property. This project will ruin this dream for our family and many others. It is too close to homes & developable land.

Planning & Zoning should not approve this Comp change, PAD change or Zoning change. Keep it Rural!

* Coolidge Fire Dept is not equipped to respond to any such emergency that may come from this project.

Please write on the back of this form if more space is needed.

Comment Form

NextEra Energy Resources

Valley Farms Energy Storage project

Neighborhood meeting

Thursday, Feb. 29, 2024

6:30-8:30 p.m.

Name: Joshua Erwin & Angel Erwin

[redacted]

Comment(s): I am opposed to this project my family and myself have many reasons we will not allow this project to proceed.

go somewhere else, I'm sure your project will do well elsewhere, where people do not reside.

Please write on the back of this form if more space is needed.

Comment Form

NextEra Energy Resources

Valley Farms Energy Storage project

Neighborhood meeting

Thursday, Feb. 29, 2024

6:30-8:30 p.m.

Name: Gilbert Lopez

[redacted]

Comment(s): We appreciate this meeting to provide our citizens with information.

The citizens of Coolidge were adament that with 16% of our city in solar, including related battery storage. So an overlay was passed that restricts Solar to the approved overlay area.

The points we that this project is in the City's Planning area that is designated Business Commerce that does not allow solar.
This project also block the approved North/South freeway, which hurts our future economic development & business opportunity.

Please write on the back of this form if more space is needed.

Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:

Issuing Agent: First American Title Insurance Company
National Commercial Services
Issuing Office: 200 SW Market Street, Suite 250, Portland, OR 97201
Issuing Office's ALTA® Registry ID:
Commitment Number: NCS-1217554-OR1
Issuing Office File Number: NCS-1217554-OR1
Property Address: 7230 North Clemans Road, Coolidge, AZ 85128
Revision Number: 1

Escrow Officer: Name:
Email:
Phone:
Title Officer: Name: Emily Collins
Email: ECollins@firstam.com
Phone: (503)795-7604

SCHEDULE A

1. Commitment Date: July 10, 2024 at 8:00 a.m.

2. Policy to be issued:
   a. ALTA® Extended Owner's Policy
      Proposed Insured: To Be Determined
      Proposed Amount of Insurance: $0.00
      The estate or interest to be insured: See Item 3 below

3. The estate or interest in the Land at the Commitment Date is:

   Fee Simple

4. The Title is, at the Commitment Date, vested in:

   Gregory C. Wuertz and Loralee Wuertz, trustees of The Gregory C. Wuertz and Loralee Wuertz Family Trust dated August 9, 1988

5. The Land is described as follows:

   See Exhibit A attached hereto and made a part hereof

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Commitment No.: NCS-1217554-OR1

SCHEDULE B, PART I—Requirements

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

2. Pay the agreed amount for the estate or interest to be insured.

3. Pay the premiums, fees, and charges for the Policy to the Company.

4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

5. Compliance with A.R.S. 11-480 relative to all documents to be recorded in connection herewith. See note at end of this section for details

   NOTE: In connection with Arizona Revised Statutes 11-480, as of January 1, 1991, the County Recorder may not accept documents for recording that do not comply with the following:

   a. Print must be ten-point type or larger.
   b. A margin of two inches at the top of the first page for recording and return address information and margins of one-half inch along other borders of every page.
   c. Each instrument shall be no larger than 8-1/2 inches in width and 14 inches in length.

   NOTE: In the event any Affidavit required pursuant to A.R.S. 33-422 relating to unsubdivided land in an unincorporated area of a country has been, or will be, recorded pertaining to the Land, such as Affidavit is not reflected in this Commitment nor will it be shown in any policy to be issued in connection with this Commitment.

6. All of 2023 taxes are paid in full.

   NOTE: Taxes are assessed in the total amount of $14,062.24 for the year 2023 under Assessor's Parcel No. 202-35-0040 4.

7. Payment in full of all assessments, late charges, transfer fees, and any other amounts due San Carlos Irrigation and Drainage District.

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8. Record full release and reconveyance of a Deed of Trust securing an original indebtedness in the amount of $968,500.00, recorded December 9, 2016 as 2016-082938 December 8, 2016 of Official Records.

Dated:	
Trustor:	Gregory C. Wuertz and Loralee Wuertz, trustees of The Gregory C. Wuertz and Loralee Wuertz Family Trust dated August 9, 1988
Trustee:	Wells Fargo Financial National Bank
Beneficiary:	Wells Fargo Bank, National Association

9. Proper showing of full payment of the debt secured by the following:

A Deed of Trust to secure an original indebtedness of $2,099,999.00 and any other amounts or obligations secured thereby, recorded September 13, 2022 as 2022-097879 of Official Records.
Dated: August 5, 2022
Trustor: Gregory C. Wuertz and Loralee Wuertz, trustees of The Gregory C. Wuertz and Loralee Wuertz Family Trust dated August 9, 1988
Trustee: Wells Fargo National Bank West
Beneficiary: Wells Fargo Bank, National Association, chartered under the laws of the United States of America
Thereafter, a Deed of Release and Reconveyance was recorded on August 21, 2023 as 2023-061380 and recorded January 2, 2024 as 2024-000382 of Official Records purporting to release said Deed of Trust.

10. Record a release of Memorandum of Real Estate Purchase Option Agreement dated April 8, 2022 and recorded May 11, 2022 as 2022-056222, by and between Gregory C. Wuertz and Loralee Wuertz, trustees of The Gregory C. Wuertz and Loralee Wuertz Family Trust dated August 9, 1988, as seller and Boulevard Associates, LLC, a Delaware limited liability company, as purchaser.

11. Furnish Plat of Survey of the subject property by a Registered Land Surveyor in accordance with the "Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys" which became effective February 23, 2021. Said Plat of survey shall include the required certification and, at a minimum, also have shown thereon Items 1, 8, 11, 16, 17, and 18 from Table A thereof. If zoning assurances are requested, Items 7(a), 7(b), 7(c) and 9 from Table A and information regarding the usage of the property must be included.

NOTE: If a Zoning Endorsement is requested, Items 7(a), 7(b) and 7(c) of Table A will also be required. If "parking" is to be added to the endorsement, the number and type of parking spaces must be shown on the survey. Property use information must also be provided to First American Title Insurance Company.

12. Furnish copies of any existing leases affecting the within described property and insertion of said leases in Schedule B of the Policy of Title Insurance.

13. Furnish certified copy of Trust Agreement dated August 9, 1988 known as The Gregory C. Wuertz and Loralee Wuertz Family Trust, together with any modification or amendments thereto.

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14. Record Warranty Deed from Gregory C. Wuertz and Loralee Wuertz, trustees of The Gregory C. Wuertz and Loralee Wuertz Family Trust dated August 9, 1988 to Buyer(s).

    NOTE: Said Deed must disclose and identify the names and addresses of the beneficiaries and the Trust Agreement in which the above Trustee is acting pursuant to ARS 33-404.

    NOTE: If this will be other than a Cash Transaction, notify the title department prior to close and additional requirements will be made.

15. Such further requirements as may be necessary after completion of the above.

16. Return to title department for final recheck before recording.

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Commitment No.: NCS-1217554-OR1

SCHEDULE B, PART II—Exceptions

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage. THIS COMMITMENT DOES NOT REPUBLISH ANY COVENANT, CONDITION, RESTRICTION, OR LIMITATION CONTAINED IN ANY DOCUMENT REFERRED TO IN THIS COMMITMENT TO THE EXTENT THAT THE SPECIFIC COVENANT, CONDITION, RESTRICTION, OR LIMITATION VIOLATES STATE OR FEDERAL LAW BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, GENDER IDENTITY, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN.

1. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I—Requirements are met.

2. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.

3. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.

4. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.

5. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the Public Records.

6. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.

7. Any lien or right to a lien for services, labor, material or equipment, unless such lien is shown by the Public Records at Date of Policy and not otherwise excepted from coverage herein.

Exceptions above will be eliminated from any ALTA Extended Coverage Policy, ALTA Homeowner's Policy, ALTA Expanded Coverage Residential Loan Policy and any short form versions thereof. However, the same or similar exception may be made in Schedule B of those policies in conformity with Schedule B, Part Two of this Commitment.

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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1. Taxes for the full year of 2024.
(The first half is due October 1, 2024 and is delinquent November 1, 2024. The second half is due March 1, 2025 and is delinquent May 1, 2025 .)

2. Reservations or Exceptions in Patents, or in Acts authorizing the issuance thereof.

   Patent recorded August 29, 1892 in Book 14 of Deeds, Page 50.

3. Any charge upon said land by reason of its inclusion in Central Arizona Water Conservation District. (All assessments due and payable are paid.)

4. Any charge upon said land by reason of its inclusion in Central Arizona Groundwater Replenishment District. (All assessments due and payable are paid.)

5. Any charge upon said land by reason of its inclusion in San Carlos Irrigation and Drainage District. (All assessments due and payable are paid.)

6. Certification by the Board of Supervisors of Pinal County, Arizona, recorded as Docket 375, Page 572, purporting to establish a county roadway.

7. An easement for utilities and incidental purposes in the document recorded as Docket 563, Page 718.

8. An easement for well and incidental purposes in the document recorded as Docket 772, Page 209.

9. An easement for transmission and distribution of electricity and incidental purposes in the document recorded as 2007-137491 of Official Records.

10. An easement for transmission and distribution of electricity and incidental purposes in the document recorded as 2009-076455 of Official Records.

11. The effect of Affidavit Regarding Annexation recorded as 2004-056341 of Official Records.

12. All matters as set forth in Record of Survey, recorded as 2014-65064 of Official Records.

13. All matters as set forth in Record of Survey, recorded as 2017-20745 of Official Records.

14. All matters as set forth in Resolution No. 2023-PZ-PA-005-22, recorded as 2023-005785 of Official Records.

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15. Any claim that the Title is subject to a trust or lien created under The Perishable Agricultural Commodities Act, 1930 (7 U.S.C. §§499a, et seq.) or the Packers and Stockyards Act (7 U.S.C. §§181 et seq.) or under similar state laws.

    Consideration for the deletion of this exception is highly fact intensive. Please contact the underwriter assigned to your file as soon as possible to discuss.

16. Any facts, rights, interests or claims which would be disclosed by a correct ALTA/NSPS survey.

17. Rights of parties in possession.

18. Any lien or claim of lien for services, labor, materials or equipment furnished in connection with improvements, repairs or renovations provided before, on, or after Date of Policy, unless such lien is shown by the Public Records at Date of Policy.

19. Water rights, claims or title to water, whether or not shown by the Public Records.

20. Any claim to (a) ownership of or rights to minerals and similar substances, including but not limited to ores, metals, coal, lignite, oil, gas, uranium, clay, rock, sand, and gravel located in, on, or under the Land or produced from the Land, whether such ownership or rights arise by lease, grant, exception, conveyance, reservation, or otherwise; and (b) any rights, privileges, immunities, rights of way, and easements associated therewith or appurtenant thereto, whether or not the interests or rights excepted in (a) or (b) appear in the Public Records or are shown in Schedule B.

21. No examination has been made of the subsequent mesne conveyance(s) of any rights in coal, oil, gas and other minerals and substances following the initial severance disclosed in specific exceptions. The present status of ownership of said interests is not disclosed herein.

22. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the Public Records, or attaching subsequent to the effective date hereof but prior to the date the proposed Insured acquires for value of record the estate or interest or mortgage thereon covered by this Report/Commitment.

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Commitment No. NCS-1217554-OR1

EXHIBIT A

The Land referred to herein below in situated in the County of Pinal, State of Arizona, and is described as follows:

THE SOUTHEAST QUARTER OF SECTION 31, TOWNSHIP 5 SOUTH, RANGE 9 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA.

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ALTA COMMITMENT FOR TITLE INSURANCE
issued by
FIRST AMERICAN TITLE INSURANCE COMPANY

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, First American Title Insurance Company, a Nebraska Corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within six months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

FIRST AMERICAN TITLE INSURANCE COMPANY

By: _____
Kenneth D. DeGiorgio, President

By: _____
Lisa W. Cornehl, Secretary

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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COMMITMENT CONDITIONS

1. DEFINITIONS
   a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.
   b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.
   c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.
   d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.
   e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.
   f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.
   g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.
   h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.
   i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.
   j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:
   a. the Notice;
   b. the Commitment to Issue Policy;
   c. the Commitment Conditions;
   d. Schedule A;
   e. Schedule B, Part I—Requirements; and
   f. Schedule B, Part II—Exceptions; and

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
   i. comply with the Schedule B, Part I—Requirements;
   ii. eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
   iii. acquire the Title or create the Mortgage covered by this Commitment.

b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.

c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.

d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.

e. The Company is not liable for the content of the Transaction Identification Data, if any.

f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.

g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.

b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.

c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.

d. The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT
The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

8. PRO-FORMA POLICY
The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. CLAIMS PROCEDURES
This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.

10. CLASS ACTION
ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.

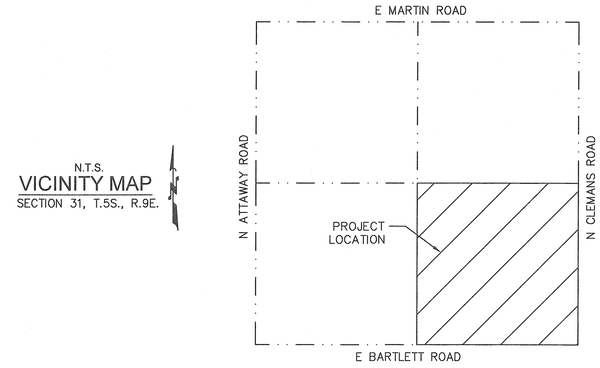
11. ARBITRATION
The Policy contains an arbitration clause. All arbitrable matters when the Proposed Amount of Insurance is $2,000,000 or less may be arbitrated at the election of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at http://www.alta.org/arbitration.

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ALTA/NSPS LAND TITLE SURVEY
NEXTERA-VALLEY FARM

LOCATED IN THE SOUTHEAST QUARTER OF
SECTION 31, TOWNSHIP 5S, RANGE 9E,
OF THE GILA AND SALT RIVER BASE AND MERIDIAN
PINAL COUNTY, COUNTY



N.T.S.
VICINITY MAP
SECTION 31, T.5S., R.9E.

TITLE REFERENCE

THIS SURVEY IS BASED UPON THE COMMITMENT FOR TITLE INSURANCE PREPARED BY STEWART TITLE GUARANTY COMPANY, ORDER NO. 23000370943 DATED MAY 04, 2023 AT 8:00 AM.

ATWELL LLC HAS RELIED SOLELY UPON THE INFORMATION CONTAINED WITHIN THE COMMITMENT OF TITLE REPORT AND SCHEDULE B DOCUMENTS PROVIDED BY STEWART TITLE GUARANTY COMPANY AS LISTED HEREON. ATWELL LLC AND JAMES G. SPRING (PLS) MAKE NO STATEMENT AS TO THE ACCURACY OR COMPLETENESS OF THE SUBJECT REPORT.

LEGAL DESCRIPTION

PARCEL 1: (APN: 202-36-003B AND 202-36-003D) (OUTSIDE PROJECT BOUNDARY)

THE SOUTHWEST QUARTER AND THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 32, TOWNSHIP 5SOUTH, RANGE 9 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA;

EXCEPT ANY PORTION THEREOF LYING EAST OF THE FLORENCE-CASA GRANDE CANAL; AND

EXCEPT THAT PORTION DESCRIBED AS FOLLOWS:

BEING A PORTION OF THE SOUTHWEST QUARTER OF SECTION 32, TOWNSHIP 5 SOUTH, RANGE 9 EAST OF THE GILAAND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID SECTION 32, BEING A 1 1/2" PIPE, FROM WHICH THE SOUTH QUARTER CORNER OF SAID SECTION 32 BEARS SOUTH 89 DEGREES 23 MINUTES 08 SECONDS EAST 2,570.97 FEET;

THENCE NORTH 01 DEGREE 53 MINUTES 12 SECONDS EAST, ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER 365.68 FEET;

THENCE SOUTH 88 DEGREES 21 MINUTES 37 SECONDS EAST 1312.84 FEET TO THE WESTERLY RIGHT-OF-WAY OF THE FLORENCE CANAL, PER FEE NUMBER 2008-037478;

THENCE SOUTH 27 DEGREES 38 MINUTES 24 SECONDS WEST, ALONG SAID RIGHT-OF-WAY 384.02 FEET TO THE SOUTH LINE OF SAID SOUTHWEST QUARTER;

THENCE NORTH 89 DEGREES 23 MINUTES 08 SECONDS WEST, ALONG SAID SOUTH LINE 1,146.45 FEET TO THE POINT OF BEGINNING.

PARCEL 2: (APN: 202-36-003C) (OUTSIDE PROJECT BOUNDARY)
THAT PORTION OF THE SOUTHWEST QUARTER OF SECTION 32, TOWNSHIP 5 SOUTH, RANGE 9 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, FINAL COUNTY, ARIZONA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID SECTION 32, BEING A 1 1/2" PIPE, FROM WHICH THE SOUTH QUARTER CORNER OF SAID SECTION 32 BEARS SOUTH 89 DEGREES 23 MINUTES 08 SECONDS EAST 2,570.97 FEET;

THENCE NORTH 01 DEGREE 53 MINUTES 12 SECONDS EAST, ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER 365.68 FEET;

THENCE SOUTH 88 DEGREES 21 MINUTES 37 SECONDS EAST 1312.84 FEET TO THE WESTERLY RIGHT-OF-WAY OF THE FLORENCE CANAL, PER FEE NUMBER 2008-037478;
THENCE SOUTH 27 DEGREES 38 MINUTES 24 SECONDS WEST, ALONG SAID RIGHT-OF-WAY 384.02 FEET TO THE SOUTH LINE OF SAID SOUTHWEST QUARTER;

THENCE NORTH 89 DEGREES 23 MINUTES 08 SECONDS WEST, ALONG SAID SOUTH LINE 1,146.45 FEET TO THE POINT OF BEGINNING.

PARCEL 3: (APN: 202-35-004) (SUBJECT PROPERTY)
THE SOUTHEAST QUARTER OF SECTION 31, TOWNSHIP 5 SOUTH, RANGE 9 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA

PARCEL 4: (APN: 209-36-0030, 209-36-004B AND 209-36-002B)
(OUTSIDE PROJECT BOUNDARY)
SOUTH HALF OF THE NORTHWEST QUARTER (S½NW¼) AND THE SOUTHWEST QUARTER (SW¼) OF SECTION 36, TOWNSHIP 5 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A 2" CONCRETE FILLED IRON PIPE WHICH MARKS THE SOUTHWEST CORNER OF SECTION 36 AND ALSO BEING THE POINT OF BEGINNING;

THENCE N 0°10'28" W ALONG THE WEST BOUNDARY OF SAID SECTION 36, A DISTANCE OF 2648.02 FEET TO THE WEST QUARTER CORNER OF SAID SECTION 36;

THENCE N 0°09'19" W, A DISTANCE OF 1321.36 FEET TO THE NORTH 1/16 CORNER COMMON TO SECTIONS 35 AND36;

THENCE N 89°45'34' E ALONG THE EAST-WEST 1/16 SECTION LINE, A DISTANCE OF 2593.93 FEET TO THE CENTER-NORTH 1/16 CORNER OF SAID SECTION 36;

THENCE S 0°45'31" E ALONG THE NORTH-SOUTH MIDSECTION LINE, A DISTANCE OF 3974.81 FEET TO A ½" REBAR MARKING THE SOUTH QUARTER CORNER OF SAID SECTION 36;

THENCE S 89°52'26"W ALONG THE SOUTH BOUNDARY OF SAID SECTION 36, A DISTANCE 2634.89 FEET TO THE POINT OF BEGINNING.

PARCEL 5: (APN: 209-36-002A) (OUTSIDE PROJECT BOUNDARY)
SOUTH HALF OF THE NORTHEAST QUARTER (S½NE¼) OF SECTION 36, TOWNSHIP 5 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER MERIDIAN, PINAL COUNTY, ARIZONA.

PARCEL 6: (APN: 20936-004A) (OUTSIDE PROJECT BOUNDARY)
WEST HALF OF THE SOUTHEAST QUARTER (W½SE¼) OF SECTION 36, TOWNSHIP 5 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER MERIDIAN, PINAL COUNTY, ARIZONA.

PARCEL 7: (APN: 209-36-0050) (OUTSIDE PROJECT BOUNDARY)
EAST HALF OF THE SOUTHEAST QUARTER (E½SE¼) OF SECTION 36, TOWNSHIP 5 SOUTH, RANGE 8 EAST OF THE GILA AND SALT RIVER MERIDIAN, PINAL COUNTY, ARIZONA.

GENERAL NOTES

1. THIS SURVEY REFLECTS ABOVE GROUND INDICATIONS OF UTILITIES. THE SURVEYOR MAKES NO GUARANTEE THAT ALL OF THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL IN THE AREA, EITHER IN SERVICE OR ABANDONED.

   THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION PROVIDED. THE SURVEYOR HAS NOT PHYSICALLY LOCATED UNDERGROUND UTILITIES.

2. DECLARATION IS MADE TO THE ORIGINAL PURCHASER OF SURVEY, AND TO THOSE PARTIES LISTED IN THE SURVEYORS CERTIFICATION.

3. THIS SURVEY IS VALID ONLY WHEN BEARING THE SEAL AND SIGNATURE OF SURVEYOR.

4. THIS SURVEY IS BASED ON FIELD WORK PERFORMED BY ATWELL DURING THE MONTH OF NOVEMBER, 2023. SITE CONDITIONS THAT MAY HAVE CHANGED SUBSEQUENT TO FIELD WORK WILL NOT BE REFLECTED HEREON.

5. BEARINGS, DISTANCES AND CURVATURE DATA SHOWN HEREON ARE MEASURED VALUES UNLESS SPECIFIED OTHERWISE.

BENCHMARK

BENCHMARK DATUM: FOUND 2" IRON PIPE 0.5' BELOW PAVEMENT
HORIZONTAL LOCATION = INTERSECTION AT EAST BARTLETT ROAD &
NORTH CLEMANS ROAD
ELEVATION = 1520.56'

REFERENCE DOCUMENTS

1. RECORD OF SURVEY, FEE NO. 2017-020745, BY HARVEY LAND SURVEYING

BASIS OF BEARING

BASIS OF BEARING WAS DERIVED HOLDING STATE PLANE VALUES OF THE FOLLOWING SYSTEM: NAD83 AZ CENTRAL INTERNATIONAL FOOT.

THE ALTA SURVEY WAS SCALED TO A GROUND SYSTEM HOLDING A COORDINATE VALUE OF 0,0 WITH A COMBINED SCALE FACTOR OF 1.000144741.

SCHEDULE B ITEMS

SEE SHEET 2

2021 ALTA/NSPS STANDARD TABLE "A" ITEMS

1. MONUMENTS HAVE BEEN PLACED (OR A REFERENCE MONUMENT OR WITNESS TO THE CORNER) AT ALL MAJOR CORNERS OF THE BOUNDARY OF THE SURVEYED PROPERTY, UNLESS ALREADY MARKED OR REFERENCED BY EXISTING MONUMENTS OR WITNESSES IN CLOSE PROXIMITY TO THE CORNER.
2. THE ADDRESS OF THE SURVEYED PROPERTY WAS NOT DISCLOSED IN DOCUMENTS PROVIDED TO OR OBTAINED BY THE SURVEYOR, OR OBSERVED WHILE CONDUCTING THE FIELDWORK.
3. SUBJECT PROPERTY LIES IN ZONE "X" (OTHER FLOOD AREAS) PER FEMA FLOOD INSURANCE RATE MAP NUMBER 04021C1250E, COMMUNITY – PINAL COUNTY, NUMBER 040077, PANEL 1250 SUFFIX E, EFFECTIVE DATE DECEMBER 4, 2007.
4. GROSS LAND AREA = 159.7 ACRES± AND/OR 6,958,166 SQUARE FEET±.
7. (A) EXTERIOR DIMENSIONS OF ALL BUILDINGS AT GROUND LEVEL = NO BUILDINGS ON SITE
8. SUBSTANTIAL FEATURES OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK. (SHOWN HEREON)
10. AS DESIGNATED BY THE CLIENT, A DETERMINATION OF THE RELATIONSHIP AND LOCATION OF CERTAIN DIVISION OR PARTY WALLS WITH RESPECT TO ADJOINING PROPERTIES. (NO ADJACENT WALLS)
11. EVIDENCE OF UNDERGROUND UTILITIES EXISTING ON OR SERVING THE SURVEYED PROPERTY. (SHOWN HEREON)
13. NAMES OF ADJOINING OWNERS ACCORDING TO CURRENT TAX RECORDS. (SHOWN HEREON)
16. EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION, OR BUILDING ADDITIONS OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK.
    (NO NEW CONSTRUCTION OR IMPROVEMENTS WITNESSED AT TIME OF SURVEY)
18. PLOTTABLE OFFSITE OR APPURTENANT EASEMENTS DISCLOSED IN DOCUMENTS PROVIDED TO OR OBTAINED BY THE SURVEYOR PURSUANT TO SECTIONS 5 AND 6. (NO ADDITIONAL DOCUMENTS FOUND, NOT A PART OF TITLE.)
19. CERTIFICATE OF INSURANCE TO BE FURNISHED UPON REQUEST, BUT THIS ITEM SHALL NOT BE ADDRESSED ON THE FACE OF THE PLAT OR MAP.

SURVEYOR'S CERTIFICATION:

TO:

1. VALLEY FARMS SOLAR
2. NEVITT FARMS, L.L.L.P., AN ARIZONA LIMITED LIABILITY LIMITED PARTNERSHIP. (PARCELS 1 AND 2)
3. GREGORY C. WUERTZ AND LORALEE WUERTZ, TRUSTEE OF THE GREGORY C. WUERTZ AND LORALEE WUERTZ FAMILY TRUST DATED AUGUST 9, 1988. (PARCEL 3)
4. CHARLES D. CARDINAL AND PENNY LYNN CARDINAL, CO-TRUSTEES OF THE CARDINAL REVOCABLE LIVING TRUST DATED JULY 8, 1994. (PARCELS 4-7) (NOT A PART)
5. STEWART TITLE GUARANTY COMPANY.

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 7(A), 8, 10, 11, 13, 16, 18 AND 19 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON NOVEMBER 22ND, 2023.

DATE OF MAP: NOVEMBER 29, 2023

JAMES G. SPRING, PLS 22282
ATWELL, LLC
4700 E. SOUTHERN AVE
MESA, AZ 85206

PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO.
22282
JAMES G.
SPRING
Date Signed 11/30/23
ARIZONA, U.S.A.

NOTE:

A.R.S. § 32-151 STATES THAT THE USE OF THE WORD "CERTIFY" OR "CERTIFICATION" BY A PERSON OR FIRM THAT IS REGISTERED OR CERTIFIED BY THE BOARD IS AN EXPRESSION OF PROFESSIONAL OPINION REGARDING FACTS OR FINDINGS THAT ARE SUBJECT OF THE CERTIFICATION AND DOES NOT CONSTITUTE AN EXPRESS OR IMPLIED WARRANTY OR GUARANTEE.

ATWELL
866.850.4200 www.atwell-group.com
4700 E. SOUTHERN AVENUE
MESA, AZ 85206
480.218.8831

COUNTY: PINAL
SECTION: 31
TOWNSHIP: 5 SOUTH
RANGE: 9 EAST

ALTA/NSPS LAND TITLE SURVEY
NEXTERA-VALLEY FARM
CITY OF CASA GRANDE, ARIZONA

NOVEMBER 2023

REVISIONS:

ATWELL

PM. J. SPRING
DR. T. CABRERA
JOB NO. 23001471
N.T.S.
23001471 NEXTERA VALLEY FARM ALTA.DWG
SHEET NO. 1 OF 4

K:\23001471 - NEXTERA - VALLEY FARM ALTA\DWG\SURVEY\ALTA\23001471 NEXTERA VALLEY FARM ALTA.DWG SAVEDATE:11/29/2023 9:57 AM PLOTDATE:11/29/2023 10:30 AM

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SCHEDULE B DOCUMENTS

1. ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLIC RECORDS OR IS CREATED, ATTACHES, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE AND THE DATE ON WHICH ALL OF THE SCHEDULE B, PART I –REQUIREMENTS ARE MET. (BLANKET IN NATURE)

2. TAXES OR ASSESSMENTS WHICH ARE NOT SHOWN AS EXISTING LIENS BY THE RECORDS OF ANY TAXING AUTHORITY THAT LEVIES TAXES OR ASSESSMENTS ON REAL PROPERTY OR BY THE PUBLIC RECORDS. (BLANKET IN NATURE)

3. PROCEEDINGS BY A PUBLIC AGENCY WHICH MAY RESULT IN TAXES OR ASSESSMENTS, OR NOTICES OF SUCH PROCEEDINGS, WHETHER OR NOT SHOWN BY THE RECORDS OF SUCH AGENCY OR BY THE PUBLIC RECORDS. (BLANKET IN NATURE)

4. ANY FACTS, RIGHTS, INTERESTS OR CLAIMS WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS BUT WHICH COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR BY MAKING INQUIRY OF PERSONS IN POSSESSION THEREOF. (BLANKET IN NATURE)

5. EASEMENTS, LIENS OR ENCUMBRANCES, OR CLAIMS THEREOF, WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS. (BLANKET IN NATURE)

6. DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGE IN AREA, ENCROACHMENTS, OR ANY OTHER FACTS WHICH A CORRECT SURVEY WOULD DISCLOSE, AND WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS. (BLANKET IN NATURE)

7. (A) UNPATENTED MINING CLAIMS; (B) RESERVATIONS OR EXCEPTIONS IN PATENTS OR IN ACTS AUTHORIZING THE ISSUANCE THEREOF; (C) WATER RIGHTS, CLAIMS OR TITLE TO WATER. (BLANKET IN NATURE)

8. ANY RIGHT, TITLE, INTEREST, ESTATE OR EASEMENT IN LAND BEYOND THE LINES OF THE AREA SPECIFICALLY DESCRIBED OR REFERRED TO IN SCHEDULE A, OR IN ABUTTING STREETS, ROADS, AVENUES, ALLEYS, LANES, WAYS OR WATERWAYS, BUT NOTHING IN THIS PARAGRAPH SHALL MODIFY OR LIMIT THE EXTENT TO WHICH THE ORDINARY RIGHT OF AN ABUTTING OWNER FOR ACCESS TO A PHYSICALLY OPEN STREET OR HIGHWAY IS INSURED BY THIS POLICY. (BLANKET IN NATURE)

9. ANY LIEN, OR RIGHT TO A LIEN, FOR SERVICES, LABOR OR MATERIAL HERETOFORE OR HEREAFTER FURNISHED, IMPOSED BY LAW AND NOT SHOWN BY THE PUBLIC RECORDS. (BLANKET IN NATURE)

10. MINERALS OF WHATSOEVER KIND, SUBSURFACE AND SURFACE SUBSTANCES, INCLUDING BUT NOT LIMITED TO COAL,LIGNITE, OIL, GAS, URANIUM, CLAY, ROCK, SAND AND GRAVEL IN, ON, UNDER AND THAT MAY BE PRODUCED FROM THE LAND TOGETHER WITH ALL RIGHTS, PRIVILEGES AND IMMUNITIES RELATING THERETO, WHETHER OR NOT APPEARING IN THE PUBLIC RECORDS OR LISTED IN SCHEDULE B. THE COMPANY MAKES NO REPRESENTATION AS TO THE PRESENT OWNERSHIP OF ANY SUCH INTERESTS. THERE MAY BE LEASES, GRANTS, EXCEPTIONS OR RESERVATIONS OF INTERESTS THAT ARE NOT LISTED. (BLANKET IN NATURE)

11. ANY ACTION BY THE COUNTY ASSESSOR AND/OR TREASURER, ALTERING THE CURRENT OR PRIOR TAX ASSESSMENT, SUBSEQUENT TO THE DATE OF THE POLICY OF TITLE INSURANCE. (BLANKET IN NATURE)

12. TAXES AND ASSESSMENTS COLLECTIBLE BY THE COUNTY TREASURER, A LIEN NOT YET DUE AND PAYABLE FOR THE YEAR 2023. (BLANKET IN NATURE)

13. RESERVATIONS OR EXCEPTIONS IN PATENTS OR IN ACTS AUTHORIZING THE ISSUANCE THEREOF. (BLANKET IN NATURE)

14. WATER RIGHTS, CLAIMS OR TITLE TO WATER, AND AGREEMENTS, COVENANTS, CONDITIONS OR RIGHTS INCIDENT THERETO, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS. THIS EXCEPTION IS NOT LIMITED BY REASON OF THE DISCLOSURE OF ANY MATTER RELATING TO WATER RIGHTS AS MAY BE SET FORTH ELSEWHERE IN SCHEDULE B. (BLANKET IN NATURE)

15. LIABILITIES AND OBLIGATIONS IMPOSED UPON SAID LAND BY REASON OF ITS INCLUSION WITHIN ANY DISTRICT FORMED PURSUANT TO TITLE 48 ARIZONA REVISED STATUTES. (BLANKET IN NATURE)

16. RESERVATIONS OR EXCEPTIONS IN PATENTS OR IN ACTS AUTHORIZING THE ISSUANCE THEREOF, RECORDED IN DOCKET 39 PAGE 447; RECORDED IN DOCKET 39 PAGE 449; RECORDED IN DEED BOOK 57 AT PAGE 116; RECORDED IN DEED BOOK 57 PAGE 117; RECORDED IN DEED BOOK 66 AT PAGE 450. (PARCELS 4–7) (OUTSIDE PROJECT BOUNDARY)

17. EASEMENT FOR RIGHT OF WAY TO ERECT, CONSTRUCT AND MAINTAIN A DITCH OVER THROUGH AND ACROSS AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 42 PAGE 533. (PARCEL 7) (OUTSIDE PROJECT BOUNDARY)

18. LIABILITIES AND OBLIGATIONS IMPOSED UPON SAID LAND BY REASON OF ITS INCLUSION WITHIN BOARD OF SUPERVISORS DECLARATION OF ROAD RECORDED IN DOCKET 375 PAGE 572. (PARCELS 3–7) (SHOWN HEREON)

19. EASEMENT FOR ELECTRICAL TRANSMISSION LINE AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 740, PAGE 379. (PARCEL 4) (OUTSIDE PROJECT BOUNDARY)

20. EASEMENT FOR ELECTRIC TRANSMISSION WHICH INCLUDES DISTRIBUTION LINES FOR THE ARRYIG AND TRANSMISSION OF POWER BY USE OF IRRIGATION AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 840 PAGE 865. (PARCEL 4) (OUTSIDE PROJECT BOUNDARY)

21. EASEMENT FOR ELECTRIC TRANSMISSION AND APPURTENANCES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 1975 PAGE 19. (PARCELS 4 AND 6) (OUTSIDE PROJECT BOUNDARY)

22. EASEMENT FOR INGRESS AND EGRESS, USE OPERATION, MAINTENANCE AND REPAIR OF THE EXISTING IRRIGATION DITCHES FOR THE DELIVERY OF WATER AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN FEE NO. 2001–007631. (PARCEL 7) (OUTSIDE PROJECT BOUNDARY)

23. LIABILITIES AND OBLIGATIONS IMPOSED UPON SAID LAND BY REASON OF ITS INCLUSION WITHIN AIRPORT ANNEXATION PHASE 1–REVISED RECORDED IN FEE NO.2004–056341. (PARCELS 4–7) (BLANKET IN NATURE)

24. EASEMENT FOR TRANSMISSION AND DISTRIBUTION PURPOSES AND APPURTENANCES AND RIGHTS INCIDENT THERETO,AS SET FORTH IN INSTRUMENT RECORDED IN FEE NO. 2007–130587. (PARCELS 4, 6 AND 7) (OUTSIDE PROJECT BOUNDARY)

25. EASEMENT FOR TRANSMISSION AND DISTRIBUTION OF ELECTRICITY AND COMMUNICATION AND APPURTENANCES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN FEE NO. 2009–050747. (PARCEL 7) (OUTSIDE PROJECT BOUNDARY)

26. LIABILITIES AND OBLIGATIONS IMPOSED UPON SAID LAND BY REASON OF ITS INCLUSION WITHIN FRANCHISE FOE SOUTHWEST GAS CORPORATION RECORDED IN FEE NO. 2016–039825. (PARCELS 4–7) (BLANKET IN NATURE)

27. UNRECORDED LEASE UNDER THE TERMS AND CONDITIONS CONTAINED THEREIN MADE BY THE CARDINAL REVOCABLE LIVING TRUST DATED JULY 9, 1994, LESSOR, AND R&W FARMS, LLC, AN ARIZONA LIMITED LIABILITY COMPANY , LESSEE, DATED JANUARY 1, 2022, EXPIRING OF DECEMBER 31, 2026, AS DISCLOSED BY MEMORANDUM OF LEASE, RECORDED APRIL 14, 2022, IN FEE NO. 2022–044870. (PARCELS 4–7) (OUTSIDE PROJECT BOUNDARY)

SCHEDULE B DOCUMENTS (CONT.)

27. UNRECORDED LEASE UNDER THE TERMS AND CONDITIONS CONTAINED THEREIN MADE BY THE CARDINAL REVOCABLE LIVING TRUST DATED JULY 9, 1994, LESSOR, AND R&W FARMS, LLC, AN ARIZONA LIMITED LIABILITY COMPANY , LESSEE, DATED JANUARY 1, 2022, EXPIRING OF DECEMBER 31, 2026, AS DISCLOSED BY MEMORANDUM OF LEASE, RECORDED APRIL 14, 2022, IN FEE NO. 2022–044870. (PARCELS 4–7) (OUTSIDE PROJECT BOUNDARY)

28. TERMS AND CONDITIONS AS CONTAINED IN INSTRUMENT ENTITLED RIGHT OF WAY PERMIT, RECORDED IN BOOK 772, PAGE 209. (PARCEL 3) (SHOWN HEREON)

29. EASEMENT FOR TRANSMISSION AND DISTRIBUTION OF ELECTRICITY AND COMMUNICATION SIGNALS AND OTHER RELATED PURPOSES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED DECEMBER 19, 2007, FEE NO. 2007–137491. (PARCEL 3) (SHOWN HEREON)

30. EASEMENT FOR TRANSMISSION AND DISTRIBUTION OF ELECTRICITY AND COMMUNICATION SIGNALS AND OTHER RELATED PURPOSES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED APRIL 22, 2008, FEE NO. 2008–037478. (PARCELS 1 AND 2) (OUTSIDE PROJECT BOUNDARY)

31. EASEMENT FOR TRANSMISSION AND DISTRIBUTION OF ELECTRICITY AND COMMUNICATION SIGNALS AND OTHER RELATED PURPOSES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED JUNE 2, 2009, FEE NO. 2009–055632. (PARCELS 1 AND 2) (OUTSIDE PROJECT BOUNDARY)

32. EASEMENT FOR TRANSMISSION AND DISTRIBUTION OF ELECTRICITY AND COMMUNICATION SIGNALS AND OTHER RELATED PURPOSES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED JULY 28, 2009, FEE NO. 2009–076455. (PARCEL 3) (SHOWN HEREON)

33. MATTERS SHOWN ON SURVEY RECORDED IN FEE NO. 2014–026072. (PARCEL 2) (OUTSIDE PROJECT BOUNDARY)

34. EASEMENT FOR ELECTRIC TRANSMISSION AND/OR DISTRIBUTION LINE OR SYSTEM AND RIGHTS INCIDENT THERETO,AS SET FORTH IN INSTRUMENT RECORDED APRIL 26, 2018, FEE NO. 2018–030813. (PARCELS 1 AND 2) (OUTSIDE PROJECT BOUNDARY)

35. TERMS AND CONDITIONS AS CONTAINED IN INSTRUMENT ENTITLED RESOLUTION NO. 2023–PA–PA–005–22, RECORDED JANUARY 26, 2023, FEE NO. 2023–005785. (PARCELS 1, 2 AND 3) (BLANKET IN NATURE)

36. MATTERS SHOWN ON SURVEY RECORDED IN FEE NO. 2017–020745. (PARCEL 3) (SHOWN HEREON)

37. ANY CLAIM THAT THE TITLE IS SUBJECT TO A TRUST OR LIEN CREATED UNDER THE PERISHABLE AGRICULTURAL COMMODITIES ACT (7 U.S.C. 499A, ET SEQ.) OR THE POULTRY AND STOCKYARDS ACT (7 U.S.C. 181 ET SEQ.) OR UNDER SIMILAR STATE LAWS. (BLANKET IN NATURE)

38. RIGHTS OF PARTIES IN POSSESSION.
THIS EXCEPTION MAY BE MADE MORE SPECIFIC UPON OUR EXAMINATION OF DOCUMENTS WHICH ENTITLE THE OCCUPANTS TO POSSESSION.
(BLANKET IN NATURE)

PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO.
22282
JAMES G. SPRING
Date Signed 11/30/23
ARIZONA, U.S.A.

ATWELL
866.850.4200 www.atwell-group.com
4700 E. SOUTHERN AVENUE
MESA, AZ 85206
480.218.8831

COUNTY: PINAL
SECTION: 31
TOWNSHIP: 5 SOUTH
RANGE: 9 EAST

ALTA/NSPS LAND TITLE SURVEY

NEXTERA-VALLEY FARM
CITY OF CASA GRANDE, ARIZONA

NOVEMBER 2023

REVISIONS:

ATWELL

PM. J. SPRING
DR. T. CABRERA
JOB NO.
23001471
N.T.S.
23001471 NEXTERA VALLEY FARM ALTA.DWG

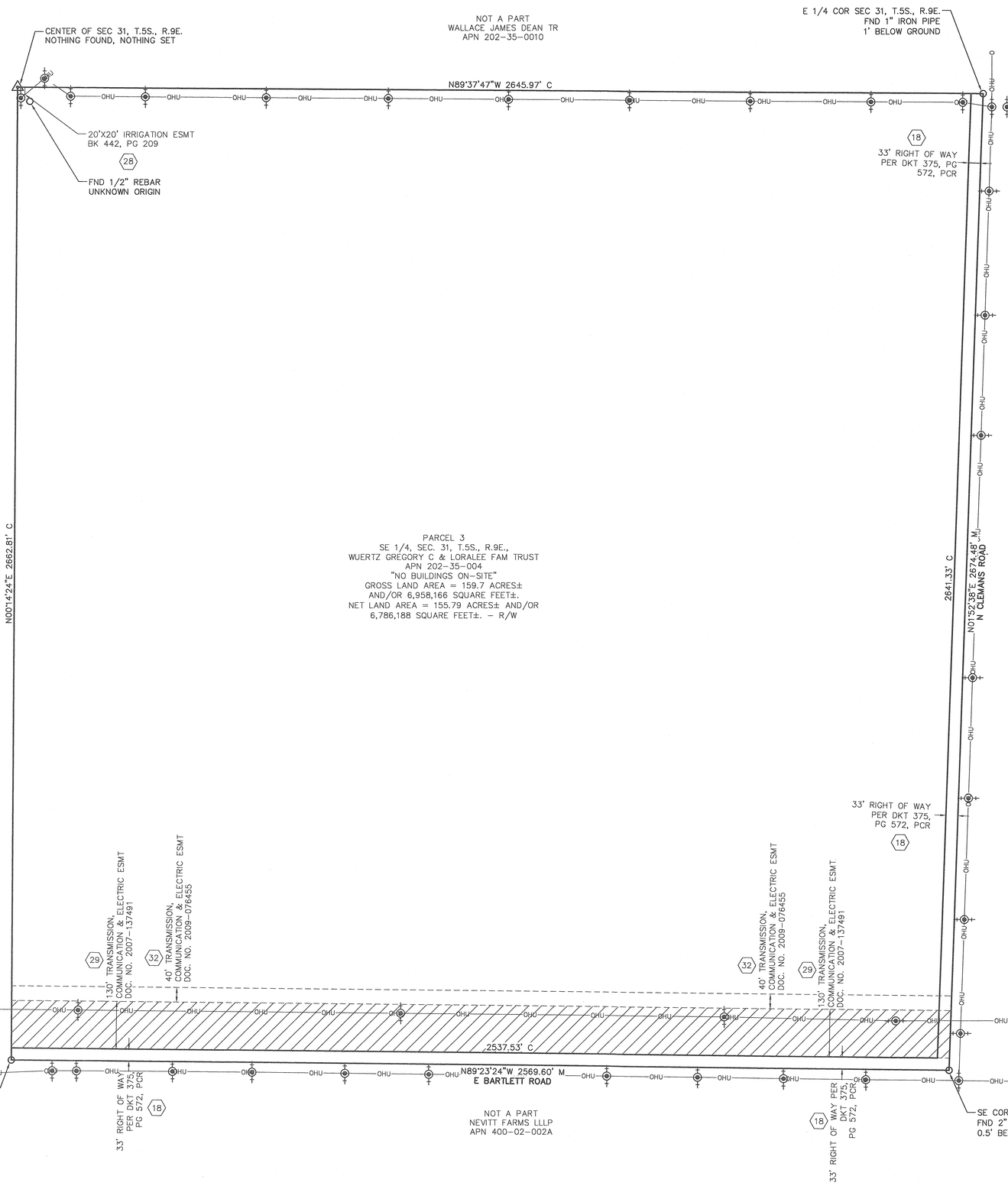
SHEET NO.
2 OF 4

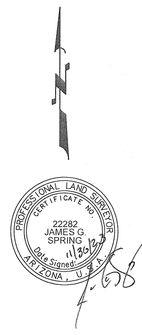
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LEGEND

— · — · — · — · —	SECTION LINE
———	PROPERTY LINE
- - - - - - - - - -	EXISTING EASEMENT
——o——o——o——	CHAIN LINK FENCE
——OHU——OHU——OHU——	OVERHEAD UTILITY LINE
○	FOUND MONUMENT AS NOTED
●	SET MONUMENT AS NOTED
△	CALCULATED MONUMENT AS NOTED
	ELECTRIC CABINET
	JUNCTION BOX
EM	ELECTRIC METER
	ELECTRIC PEDISTAL
	POWER POLE
	GUY ANCHOR
T.	TOWNSHIP
R.	RANGE
APN	ASSESSOR PARCEL NUMBER
PCR	PINAL COUNTY RECORDS
ESMT	EASEMENT
BK PG	BOOK PAGE
DOC	DOCUMENT
M	MEASURED BEARING AND OR DISTANCE
C	CALCULATED BEARING AND OR DISTANCE
PLS/LS	PROFESSIONAL LAND SURVEYOR





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SECTION: 31
TOWNSHIP: 5 SOUTH
RANGE: 9 EAST

ALTA/NSPS LAND TITLE SURVEY
NEXTERA-VALLEY FARM
CITY OF CASA GRANDE, ARIZONA

NOVEMBER 2023

REVISIONS:

ATWELL

PM. J. SPRING
DR. T. CABRERA
JOB NO.
23001471

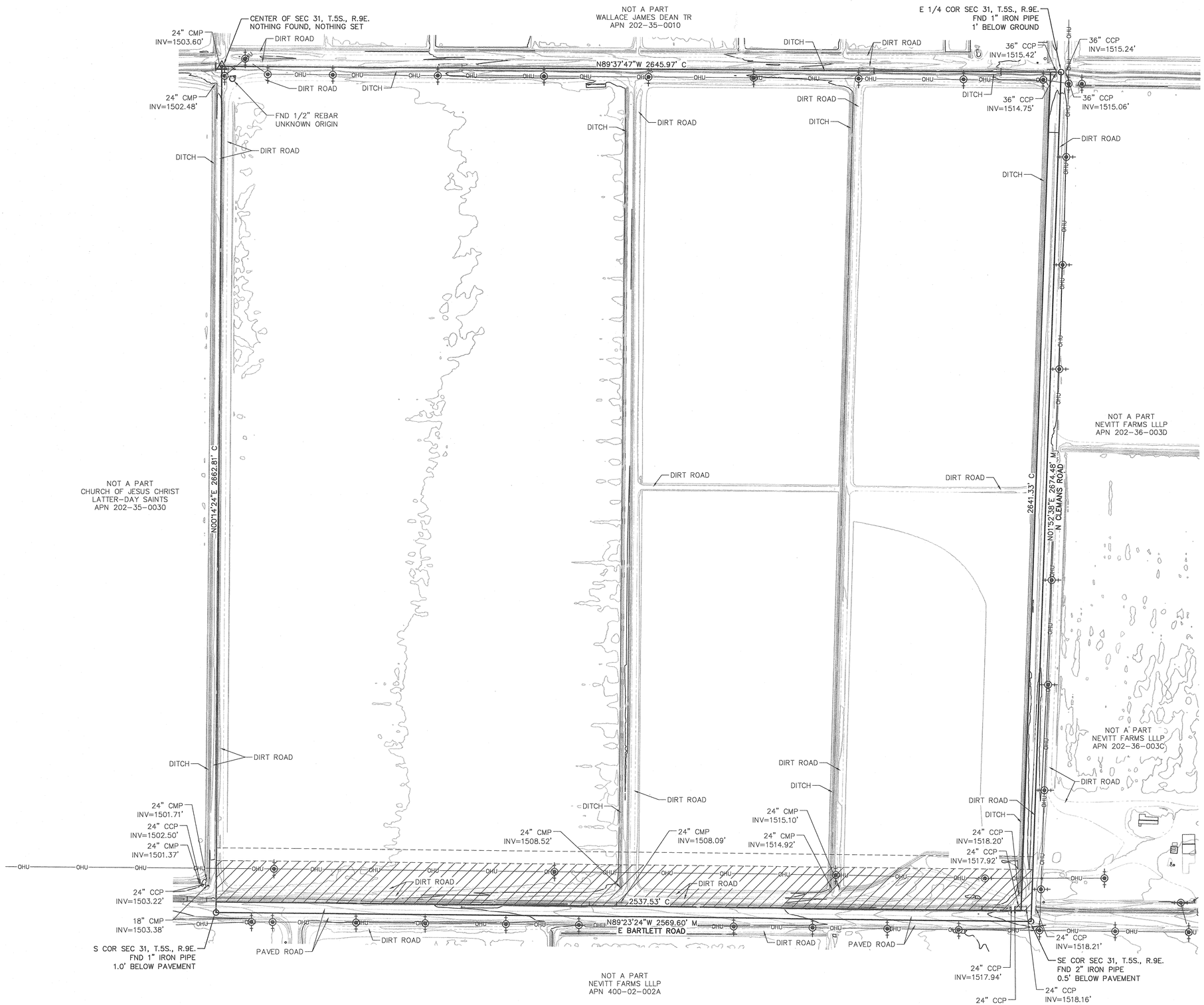
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1" = 150 FEET

23001471 NEXTERA VALLEY FARM ALTA.DWG

SHEET NO.
3 OF 4

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MESA, AZ 85206
480.218.8831

COUNTY: PINAL
SECTION: 31
TOWNSHIP: 5 SOUTH
RANGE: 9 EAST

ALTA/NSPS LAND TITLE SURVEY

NEXTERA-VALLEY FARM

CITY OF CASA GRANDE, ARIZONA

NOVEMBER 2023

REVISIONS:

PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO.
22282
JAMES G. SPRING
Date Signed 11/30/23
ARIZONA, U.S.A.

ATWELL

PM. J. SPRING
DR. T. CABRERA
JOB NO.
23001471

SCALE 0 75 150
1" = 150 FEET

23001471 NEXTERA VALLEY FARM ALTA.DWG

SHEET NO.
4 OF 4

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ATWELL

ONE COMPANY.
INFINITE SOLUTIONS.

LEGAL DESCRIPTION
BOUNDARY EXHIBIT
APN 202-35-004
PINAL COUNTY, ARIZONA

LOCATED WITHIN A PORTION OF THE SOUTHEAST QUARTER OF SECTION 31, TOWNSHIP 5 SOUTH, RANGE 9 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA.

MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND 1 INCH IRON PIPE, ACCEPTED AS THE SOUTH QUARTER CORNER OF SECTION 31, TOWNSHIP 5 SOUTH, RANGE 9 EAST FROM WHICH A FOUND 2 INCH IRON PIPE, ACCEPTED AS THE SOUTHEAST CORNER OF SECTION 31, TOWNSHIP 5 SOUTH, RANGE 9 EAST, THEREOF BEARS S89°23'24"E A DISTANCE OF 2569.97 FEET;

THENCE, N00°14'24"E A DISTANCE OF 33.01 FEET TO THE **POINT OF BEGINNING**;

THENCE, N00°14'24"E A DISTANCE OF 2630.19 FEET;

THENCE, S89°37'47"E A DISTANCE OF 2613.33 FEET;

THENCE, S01°52'38"W A DISTANCE OF 2641.72 FEET;

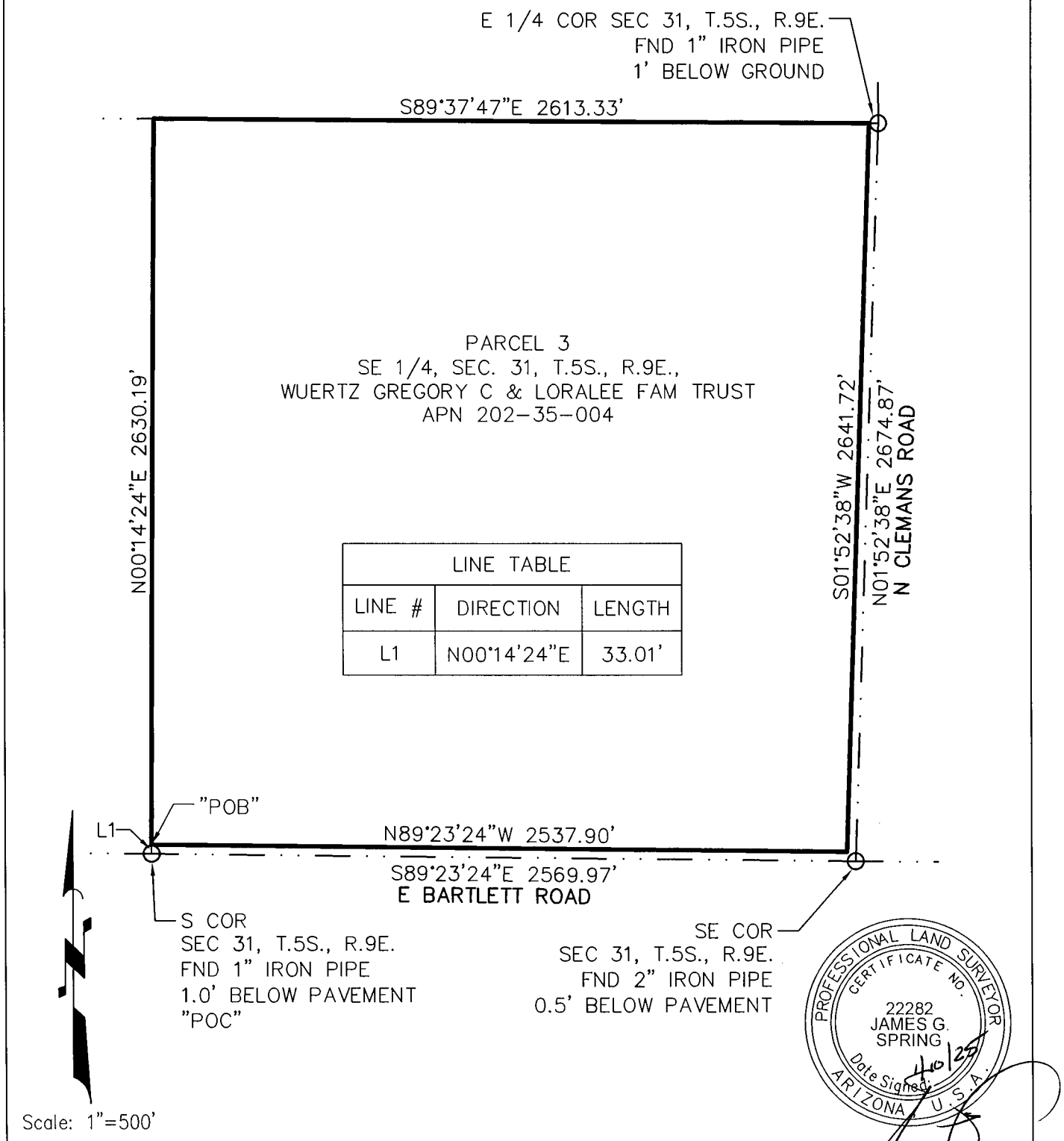
THENCE, N89°23'24"W A DISTANCE OF 2537.90 FEET TO THE **POINT OF BEGINNING**.

THE ABOVE DESCRIBED PARCEL CONTAINS A COMPUTED AREA OF 6,788,152 SQUARE FEET OR 155.83 ACRES, MORE OR LESS AND IS SUBJECT TO ANY EASEMENTS, RESTRICTIONS, OR RIGHTS OF WAY OF RECORD OR OTHERWISE.

THE DESCRIPTION SHOWN HEREON IS NOT TO BE USED TO VIOLATE ANY SUBDIVISION REGULATIONS OF THE STATE, COUNTY AND/OR MUNICIPALITY OR ANY OTHER LAND DIVISION RESTRICTIONS.

PREPARED BY:
ATWELL, LLC
4700 E. SOUTHERN AVENUE
MESA, ARIZONA 85206
PROJECT NO. 23001471
DATE JANUARY 10TH, 2025

PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO.
22282
JAMES G.
SPRING
Date Signed 1/10/25
ARIZONA, U.S.A.



LINE TABLE		
LINE #	DIRECTION	LENGTH
L1	N00°14'24"E	33.01'

PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO.
22282
JAMES G.
SPRING
Date Signed 1/10/25
ARIZONA, U.S.A.

JOB NO. 23001471 PRODUCT TYPE: EX DATE: 01-10-2024 | SHEET 2 OF 2

ATWELL
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4700 E. SOUTHERN AVENUE
MESA, AZ 85206
480.218.8831

EXHIBIT "A"
BOUNDARY EXHIBIT
APN 202-35-004
CITY OF CASA GRANDE, ARIZONA

K:\23001471 - NEXTERA - VALLEY FARM ALTA\DWG\SURVEY\EXHIBITS\23001471 BOUNDARY EXHIBIT APN 202-35-004.DWG
SAVE DATE: 1/10/2025 8:46 AM PLOT DATE: 1/10/2025 9:00 AM

Arizona Environmental Online Review Tool Report

Arizona Game and Fish Department Mission
To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

Project Name:
Valley Farms Energy Center Project

User Project Number:
81775

Project Description:
Valley Farms Energy Center, LLC is proposing to construct, operate, and maintain the Valley Farms Energy Center Project, a utility-scale photovoltaic solar facility and battery energy storage system.

Project Type:
Energy Production/Storage/Transfer, Energy Production (generation), photovoltaic solar facility (new/expansion)

Contact Person:
Stacy Campbell

Organization:
SWCA

On Behalf Of:
PRIVATE

Project ID:
HGIS-20861

Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.

Disclaimer:

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. Arizona Wildlife Conservation Strategy (AWCS), specifically Species of Greatest Conservation Need (SGCN), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

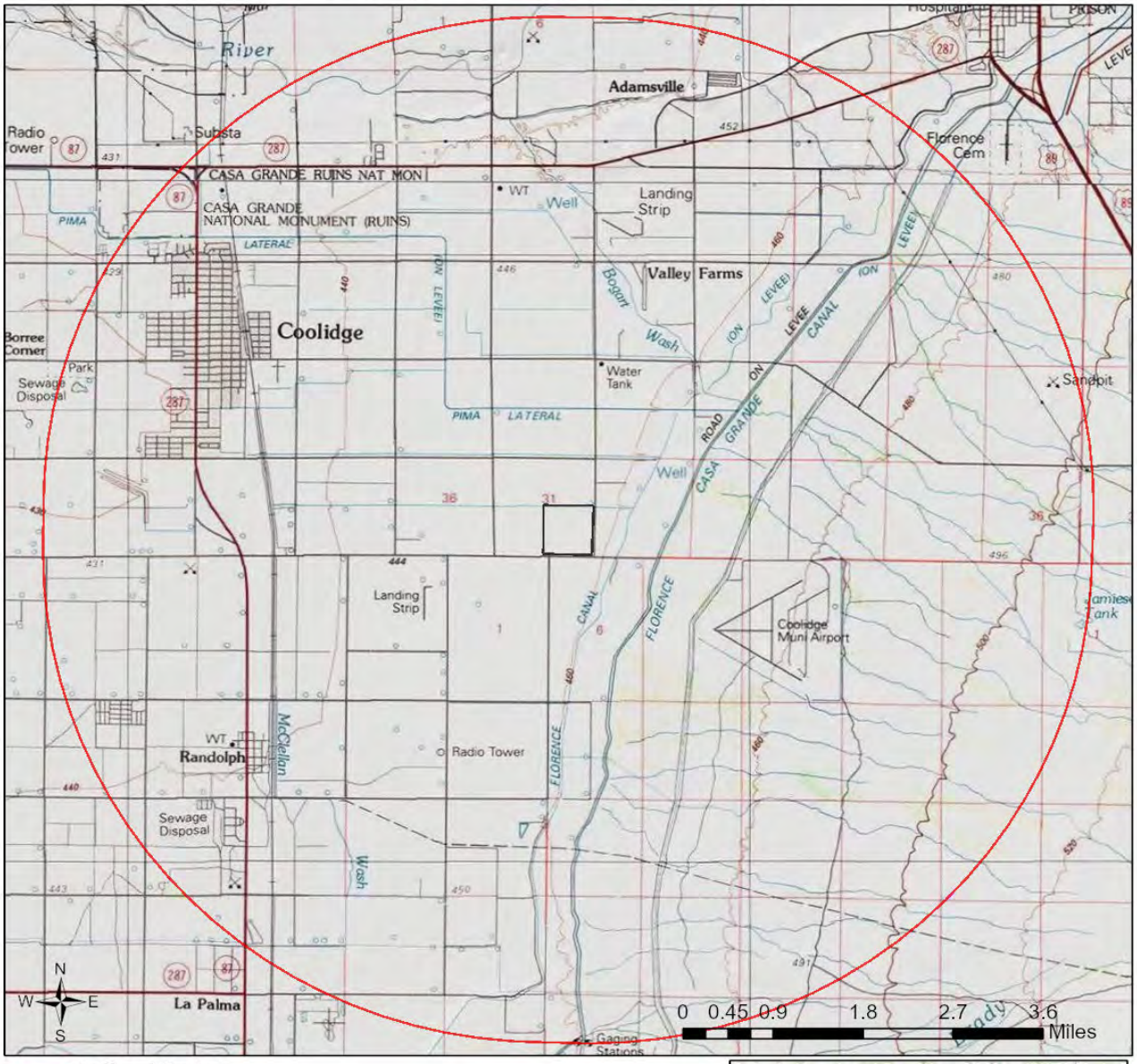
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:
   Project Evaluation Program, Habitat Branch
   Arizona Game and Fish Department
   5000 West Carefree Highway
   Phoenix, Arizona 85086-5000
   Phone Number: (623) 236-7600
   Fax Number: (623) 236-7366
   Or
   PEP@azgfd.gov
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.

Valley Farms Energy Center Project

USA Topo Basemap With Locator Map



Buffered Project Boundary

Project Boundary

Project Size (acres): 158.33

Lat/Long (DD): 32.9483 / -111.4598

County(s): Pinal

AGFD Region(s): Tucson

Township/Range(s): T5S, R9E

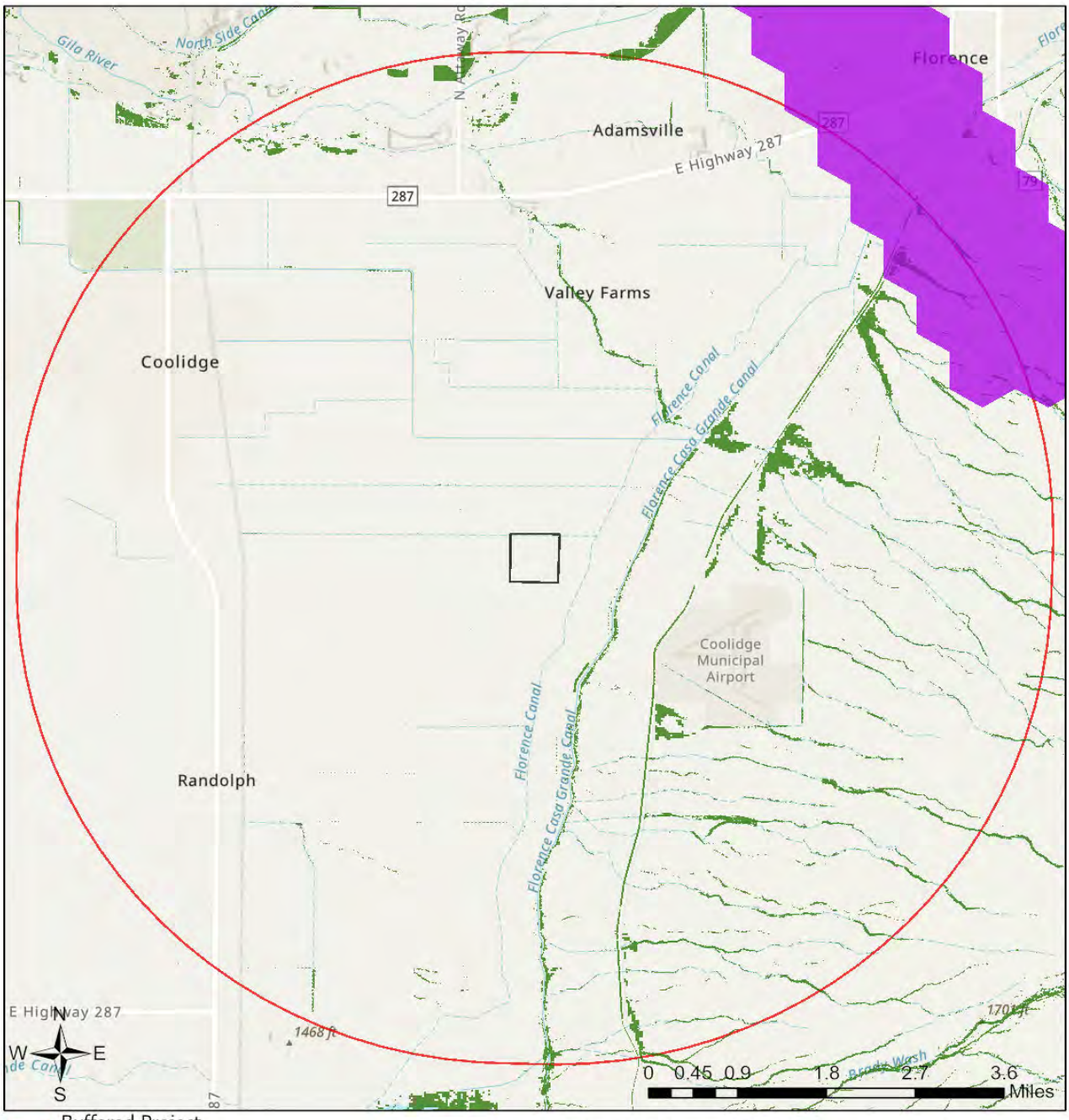
USGS Quad(s): VALLEY FARMS



County of Yavapai, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Copyright:© 2013 National Geographic Society, i-cubed
Esri, USGS

Valley Farms Energy Center Project

Important Areas



- Buffered Project Boundary
- Project Boundary
- Important Bird Areas
- Critical Habitat
- Pinal County Riparian
- Important Connectivity Zones
- Wildlife Connectivity

Project Size (acres): 158.33

Lat/Long (DD): 32.9483 / -111.4598

County(s): Pinal

AGFD Region(s): Tucson

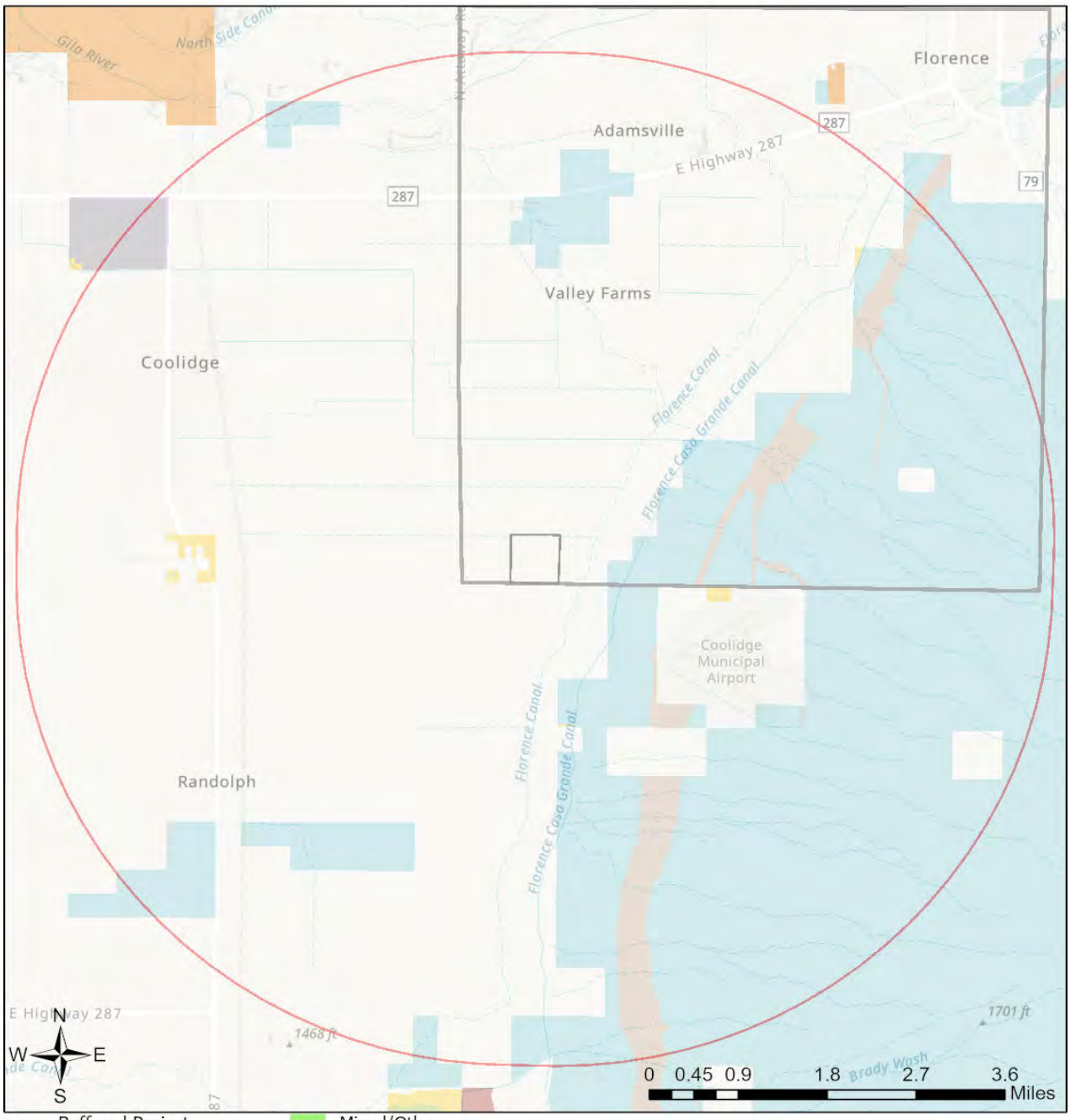
Township/Range(s): T5S, R9E

USGS Quad(s): VALLEY FARMS

Esri, NASA, NGA, USGS
Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS

Valley Farms Energy Center Project

Township/Ranges and Land Ownership



- Buffered Project Boundary
- Project Boundary
- AZ Game & Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State & Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge
- Township/Ranges

Project Size (acres): 158.33

Lat/Long (DD): 32.9483 / -111.4598

County(s): Pinal

AGFD Region(s): Tucson

Township/Range(s): T5S, R9E

USGS Quad(s): VALLEY FARMS

Esri, NASA, NGA, USGS
Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS

Special Status Species Documented within 5 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		2
Catostomus clarkii	Desert Sucker	SC	S	S		2
Incilius alvarius	Sonoran Desert Toad					2
Lepus alleni	Antelope Jackrabbit					2
Perognathus amplus	Arizona Pocket Mouse					2
Toxostoma bendirei	Bendire's Thrasher					2

Note: Status code definitions can be found at https://www.azgfd.com/wildlife-conservation/on-the-ground-conservation/state-wildlife-action-plan/state-wildlife-action-plan-status-definitions/.

No Special Areas Detected
No special areas were detected within the project vicinity.

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Ammospermophilus harrisii	Harris' Antelope Squirrel					
Anthus spragueii	Sprague's Pipit	SC				2
Aquila chrysaetos	Golden Eagle			S		2
Artemisiospiza nevadensis	Sagebrush Sparrow					
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		2
Auriparus flaviceps	Verdin					2
Botaurus lentiginosus	American Bittern					2
Buteo regalis	Ferruginous Hawk	SC		S		2
Buteo swainsoni	Swainson's Hawk					2
Calcarius ornatus	Chestnut-collared Longspur					2
Calypte costae	Costa's Hummingbird					2
Campylorhynchus brunneicapillus	Cactus Wren					2
Chaetodipus baileyi	Bailey's Pocket Mouse					2
Charadrius montanus	Mountain Plover	SC				2
Chilomeniscus stramineus	Variable Sandsnake					2
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)					
Colaptes chrysoides	Gilded Flicker			S		2
Columbina inca	Inca Dove					2
Empidonax wrightii	Gray Flycatcher					2
Eumops perotis californicus	Greater Western Bonneted Bat					
Falco mexicanus	Prairie Falcon					2
Falco peregrinus anatum	American Peregrine Falcon					
Falco sparverius	American Kestrel					2
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1
Icterus bullockii	Bullock's Oriole					2

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Incilius alvarius	Sonoran Desert Toad					2
Lanius ludovicianus	Loggerhead Shrike	SC				2
Lasiurus xanthinus	Western Yellow Bat		S			2
Lepus alleni	Antelope Jackrabbit					2
Lithobates yavapaiensis	Lowland Leopard Frog	SC	S	S		1
Megascops kennicottii	Western Screech-owl					
Melanerpes uropygialis	Gila Woodpecker					2
Melospiza lincolnii	Lincoln's Sparrow					2
Micrathene whitneyi	Elf Owl					
Myotis velifer	Cave Myotis	SC		S		2
Myotis yumanensis	Yuma Myotis	SC				2
Neotamias cinereicollis	Gray-collared Chipmunk					
Parabuteo unicinctus	Harris's Hawk					2
Passerculus sandwichensis	Savannah Sparrow					2
Perognathus amplus	Arizona Pocket Mouse					2
Phrynosoma solare	Regal Horned Lizard					2
Pooecetes gramineus	Vesper Sparrow					2
Spizella breweri	Brewer's Sparrow					2
Tadarida brasiliensis	Brazilian Free-tailed Bat					
Toxostoma bendirei	Bendire's Thrasher					2

Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Zenaida asiatica	White-winged Dove					
Zenaida macroura	Mourning Dove					

Project Type: Energy Production/Storage/Transfer, Energy Production (generation), photovoltaic solar facility (new/expansion)

Project Type Recommendations:
During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife. Guidelines for many of these can be found at: https://www.azgfd.com/wildlife-conservation/planning-for-wildlife/planning-for-wildlife-wildlife-friendly-guidelines/.

Consider impacts of outdoor lighting on wildlife and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use. Use only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, canted, or cut to ensure that light reaches only areas needing illumination.

Minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects and pathogens. Precautions should be taken to wash and/or decontaminate all equipment utilized in the project activities before entering and leaving the site. See the Arizona Department of Agriculture website for a list of prohibited and restricted noxious weeds at https://www.invasivespeciesinfo.gov/unitedstates/az.shtml and the Arizona Native Plant Society https://aznps.com/invas for recommendations on how to control. To view a list of documented invasive species or to report invasive species in or near your project area visit iMapInvasives - a national cloud-based application for tracking and managing invasive species at https://imap.natureserve.org/imap/services/page/map.html.

- To build a list: zoom to your area of interest, use the identify/measure tool to draw a polygon around your area of interest, and select “See What’s Here” for a list of reported species. To export the list, you must have an account and be logged in. You can then use the export tool to draw a boundary and export the records in a csv file.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (include spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

For any powerlines built, proper design and construction of the transmission line is necessary to prevent or minimize risk of electrocution of raptors, owls, vultures, and golden or bald eagles, which are protected under state and federal laws. Limit project activities during the breeding season for birds, generally March through late August, depending on species in the local area (raptors breed in early February through May). Conduct avian surveys to determine bird species that may be utilizing the area and develop a plan to avoid disturbance during the nesting season. For underground powerlines, trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herpetofauna (snakes, lizards, tortoise) from entering ditches. In addition, indirect affects to wildlife due to construction (timing of activity, clearing of rights-of-way, associated bridges and culverts, affects to wetlands, fences) should also be considered and mitigated.

Based on the project type entered, coordination with State Historic Preservation Office may be required (https://azstateparks.com/).

Based on the project type entered, coordination with U.S. Fish and Wildlife Service (Migratory Bird Treaty Act) may be required (https://www.fws.gov/office/arizona-ecological-services).

Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly at PEP@azgfd.gov.

Project Location and/or Species Recommendations:
HDMS records indicate that **Western Burrowing Owls** have been documented within the vicinity of your project area. Please review the western burrowing owl resource page at https://www.azgfd.com/wildlife-conservation/conservation-and-endangered-species-programs/burrowing-owl-management/.

PRELIMINARY DRAINAGE REPORT

VALLEY FARMS ENERGY CENTER
PINAL COUNTY, ARIZONA

Prepared for

NextEra Energy
700 Universe Blvd
Juno Beach, FL 33408

Atwell Project No. 24000083



Expires 3/31/2027

Submitted by Atwell, LLC

REVISION NO:	DATE:	REVISION:	PROJECT MANAGER APPROVAL (INITIAL & DATE)	CLIENT APPROVAL (INITIAL & DATE)
	09/06/2024	Final Report		

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1 Project Description

Valley Farms Energy Center, LLC (Applicant), a wholly owned indirect subsidiary of NextEra Energy Resources, is requesting a Zone Change and Planned Area Development (PAD) Overlay District to construct, operate, and maintain the Valley Farms Energy Center Project, a utility-scale photovoltaic (PV) solar facility and battery energy storage system (BESS) on approximately 160 acres of private land in unincorporated Pinal County, Arizona.

The proposed construction consists of a PV solar facility and a battery energy storage system and will include a substation and associated electrical equipment mounted on mat foundations.

Proposed earthwork will consist of typical clearing and grubbing of vegetation and grading with associated cuts and fills necessary for equipment installation. Dirt or gravel access and maintenance roads will be constructed to access the site and substation. Natural drainage patterns will be maintained through and around the site.

2 Location

The project is located in central Pinal County in southern Arizona, approximately 4.30 miles southeast of Coolidge, Arizona. The west edge of the project is approximately 2600' east of North Attaway Road. The north edge of the project is bounded by East Malorie Lane. The east edge of the project is bounded by North Clemans Road. The south edge of the project is bounded by East Bartlett Road. The site is part of the Middle Gila watershed.



Figure 1: Project Location

3. Soils

The site and surrounding areas are relatively flat with typical slopes ranging between 0-5%. The soil types are a mix of silty loams, sandy loams and clay loams. The surface runoff rate for the site is low. The runoff rate shows the amount of stormwater that is not infiltrated. The low rate shows that a large percentage of the stormwater for the site infiltrates into the soil before leaving the site and entering the waterways. The full Soils Report from the USDA is included in Appendix A.

4. Land Cover

4.1 Existing Conditions

The site is dominated by mostly flat, agricultural land that has historically been used for farming. The site is located within flood zone X, areas of minimal flood hazard, according to FIRM panel 04021C1250E dated 12/04/2007. This FIRM panel is located within Appendix A. The National Wetland inventory shows an existing drainage channel north of the site classified as Riverine habitat. Existing Conditions Exhibit Maps are shown in Appendix D.

4.2 Proposed Conditions

The Valley Farms Energy Center Project will be a battery energy storage and solar PV facility and will include associated electrical facilities mounted on mat foundations including high voltage equipment. The ground surface around the BESS equipment will likely be gravel, with surface runoff flowing off the equipment pads. Analysis within this report has assumed that proposed ground cover within the access roads, substation pad, and BESS equipment areas will be gravel, and the remainder of the site including the PV array areas will be seeded with low-maintenance tall grass that will maintain the hydrologic characteristics of the existing conditions. Natural drainage patterns will be maintained through and around the site, to the greatest extent practical, to minimize environmental impacts to the surrounding areas. A stormwater detention pond will be needed, with appropriate drainage swales to convey runoff into the pond. For the purposes of this report, it is assumed that offsite flows are to be diverted around the project site. Proposed Conditions Exhibit Maps are shown in Appendix E.

5. Weather and Climate

Pinal County, Arizona is situated at an average elevation of 2,340’ above sea level with temperatures ranging from an average daytime high in July of 105 degrees Fahrenheit to an average daily low in January of 38 degrees Fahrenheit. The county receives approximately 11 inches of rainfall in a typical year. August is the wettest month with 1.8 inches of rain, and the driest month is June with 0.1 inches of rain. Pinal County, Arizona averages 0.5 inches of snowfall in a typical year. On average, there are 292 days of sunshine per year.

6. Design Requirements

The Pinal County, Arizona Drainage Manual Volume I and II provide acceptable methods for drainage design. The rational method is provided as an acceptable method for estimation of peak runoff and detention storage requirements. Further discussion of the rational method is included below.

7. Design Methodology

The proposed site will attempt to preserve the existing runoff patterns to the extent possible. Waterways will not be impacted by the proposed development and careful ground preparation will preserve or even enhance the hydrologic properties of the existing soils.

8. Modified Soil Cover Complex Method

Also known as TR-55, this method is recommended to determine the peak discharge and a hydrograph from individual drainage areas up to 1 square mile. Only a peak discharge may be determined using the Graphical Peak Discharge method, thus is not used or described in this study. A peak discharge and a hydrograph may be determined using the Tabular Hydrograph method and is the method that was used in this study with the assistance of modern HEC-RAS software (described in more detail further in this report). Input requirements for both the Graphical Peak Discharge method and the Tabular Hydrograph method include:

1. Q – runoff (in). Variables used to calculate Q include P – rainfall (in), Ia – initial abstraction (in), and S – potential maximum retention after runoff begins (in). Values of P should be calculated for the project site based on the 24 hour rainfall events.
2. Tc – time of concentration (hours – minimum is 6 minutes or 0.1 hours).
3. Am – drainage area (sq. miles)
4. Appropriate rainfall distribution (Type I, IA, II, and III). This information is necessary to compute the unit peak discharge, Qu, for the Graphical method, and the tabular hydrograph unit discharge, Qt, for the Tabular method. Pinal County, Arizona has a Type II distribution.

9. Rational Method

The Rational Method was utilized to determine the peak runoff for the site. The Rational Method predicts peak runoff by the following formulas from section 2.2.1 within the Pinal County, Arizona Drainage Manual Volume II.

1. $Q = CiA$ **EQUATION 1**

    a. Where “Q” represents the peak discharge (cfs)
    b. Where “C” represents the runoff coefficient
    c. Where “I” represents the rainfall intensity (in/hr)
    d. Where “A” represents the sub-catchment area (acres)

2. $C_w = A_1C_1 + A_nC_n / A_1+A_n$ **EQUATION 2**

    a. Where “C_w” represents the weighted runoff coefficient
    b. Where “A_n” represents the area of each landcover within the sub-catchment (acres)
    c. Where “C_n” represents the runoff coefficient of the corresponding landcover

3. $T_c = 11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}$ **EQUATION 3**

    a. Where “T_c” represents time of concentration (hours)
    b. Where “L” represents length of the longest flow path (miles)
    c. Where “K_b” represents watershed resistance coefficient
    d. Where “S” represents watercourse slope (ft/mi)
    e. Where “i” represents rainfall intensity (in/hr)

4. $K_b = mLogA + b$ **EQUATION 4**

    a. Where “K_b” represents watershed resistance coefficient
    b. Where “m” and “b” represent empirical parameters from table 2-2 within the Pinal County, Arizona Drainage Manual Volume II
    c. Where “A” drainage area (acres)

5. $V = C(P/12)A$ **EQUATION 5**

   a. Where “V” represents storage volume required (acre-ft)
   b. Where “C” represents Runoff Coefficient
   c. Where “P” represents 100-yr, 2-hour precipitation (inches)
   d. Where “A” represents drainage area (acres)

Since the equation for the time of concentration has two unknowns (T_c and i), an iterative process using Intensity-Duration-Frequency (IDF) curves was required to generate the values for T_c and i, an initial estimate was made for T_c to generate the rainfall intensity from the IDF curve. Using the rainfall intensity, T_c was then solved for and if the estimated and returned value were comparable, the final rainfall intensity value is obtained.

10. Rational Method Results – Storm Events

Rational Method equations and calculations were utilized to analyze the 2-year, 10-year, 25-year and the 100-year 2-hour storm event. The Pinal County, Arizona Drainage Manual Volume II states that all detention basins for new developments shall be designed to accommodate the volume of the 100-year 2-hour storm event. The manual also requires that peak flow of the 100-year 2-hour storm event be discharged from any detention basin at or lower than the existing peak flow. This analysis was completed for the proposed site boundary only.

The site basin consists of the proposed site, cultivated crops, developed open space and developed low intensity land covers.

The following tables provides the results of pre-development values for peak flow and the corresponding values for the Weighted Runoff Coefficient, Time of Concentration, and Intensity. The existing conditions calculations are included in Appendix B.

Existing Basin	
Weighted Runoff Coefficient (Cw)	0.20
Time of Concentration (Tc, Hrs)	0.33
Intensity (i, In/Hr)	5.96
Peak Flow - 2/10-yr (Q, cfs)	150.19
Peak Flow - 25-yr (Q, cfs)	165.21
Peak Flow - 100-yr (Q, cfs)	190.06

Proposed Basin	
Weighted Runoff Coefficient (Cw)	0.31
Time of Concentration (Tc, Hrs)	0.22
Intensity (i, In/Hr)	5.96
Peak Flow - 2/10-yr (Q, cfs)	264.36
Peak Flow - 25-yr (Q, cfs)	290.80
Peak Flow - 100-yr (Q, cfs)	333.17

11. Rational Method Results – Preliminary Detention Pond Sizing

All detention ponds within Pinal County, Arizona must be designed to accommodate the peak flow and volume from runoff during the 100-yr, 2-hour storm event and requires one foot of freeboard. Using Equation 5 above, the total required storage of the pond for the required storm event is 9.61 acre-feet of storage. The Watershed Runoff Coefficient is the weighted coefficient of the proposed conditions, and the 100-yr 2-hour precipitation value is obtained from the National Oceanic and Atmospheric Administration (NOAA) data.

Detention Pond Required Storage	
Pond Bottom Length (ft)	1074
Pond Bottom Width (ft)	265
Pond Storage Depth (ft)	1.5
Pond Depth with Freeboard (ft)	2.5
Watershed Runoff Coefficient	0.31
100-yr 2-hour Precipitation (inches)	2.41
Drainage Area	156.18
Storage Volume Required (acre-ft)	9.61
Storage Volume Provided (acre-ft)	9.94

The pond is sized with a 265'x1074' bottom and side slopes of 4:1. A storage depth of 1.5' provides pond capacity of 9.94 acre-feet. An additional foot of depth will be required for freeboard and to allow for construction of an overflow weir, therefore the total pond depth will be 2.5'. An outlet structure will be required and must discharge offsite at a rate not to exceed the 190 cfs peak flow from the existing 100-yr 2-hour storm event as required. Full pond calculations are included in Appendix C.

The site has an average slope of less than 0.5% with a total elevation change across the site of 23'. This may create challenges for a pond set below grade. If challenges are persistent, there may be the need to import material to raise the BESS site pad and pond to allow for pond release. If outletting the pond proves to be challenging a retention pond may be reviewed and designed within the Pinal County, Arizona standards. If a retention pond is desired, further infiltration testing will be required to ensure adequate infiltration rates. Further review of outlet structure/pipes and the potential need for additional import fill material should be conducted during final design.

12. Site Stormwater Design Recommendations

The project site is located within Pinal County, Arizona. The final stormwater design should comply with the standard specifications and design criteria provided by the county. The current requirements are outlined within the Pinal County, Arizona Drainage Manual Volume I and II.

The existing site and surrounding areas are sloped in the western direction. The proposed design includes one detention pond for the basin. Swales are recommended to direct stormwater runoff from the BESS & PV site into the pond. The location of the proposed detention pond has been shifted from the location provided in the initial layout. This is to maintain existing drainage patterns and situate the pond at a relative low point within the site.

It is recommended that offsite runoff from the east be diverted around the BESS & PV site by a diversion berm or other stormwater management structure. This is to minimize runoff impact to the equipment and roads found within the BESS. This practice will also limit the amount of runoff considered for the pond design and allow a smaller pond that only holds runoff from the project site.

The detention pond should be sized to detain the 100-year 2-hour storm event while maintaining 1' of freeboard. The pond should include an outlet structure which reduces the proposed peak outflow to equal or less than the

existing peak flow of the 100-year 2-hour storm event. An emergency overflow is recommended in order to facilitate storms larger than the design storm. If the proposed swales are determined to make a point of concentration or inlet to the pond, a minimum 2 percent bottom slope is recommended, and low flow or pilot channel constructed across the facility bottom from point of concentration or inlet to the outlet is recommended to convey low flows and prevent standing water conditions. Per the calculations outlined in section 12, the preliminary size for the pond is 265'x1074'x2.5'.

All graded areas should be stabilized immediately after final grading is completed. Graded slopes should be roughened to a depth of 2-4" prior to seeding. All graded areas should be inspected to follow the state requirements for erosion periodically and after rainfall events of ½" or greater.

A temporary construction entrance should be provided at any point where traffic moves between the construction site and a public road. Sediment fence should be installed to prevent sediment from leaving the site.

13. Proposed Site Layout Areas of Concern

The proposed site layout includes a centrally located detention pond. The site slopes from east to west, with the western edge of the project approximately 2.0' lower than the detention pond location. In order to convey runoff into the proposed pond, the western portion of the site will require regrading to reverse the existing runoff flow direction. Swales will be required to capture flows from the western and northeastern portions of the site and convey them to the pond. Culverts may also be necessary to convey flows beneath proposed access roads. Providing an outlet location for the proposed pond may also be difficult, and an additional swale may be necessary to convey flows from the pond outlet pipe into existing drainage channels.

In the existing condition, offsite stormwater from the area to the east between N Clemans Road and the existing drainage channel flows onto the site. A diversion structure, such as a berm or swale, will be necessary to redirect upstream flows away from the proposed project, or the proposed detention pond will require additional capacity to capture the upstream flows.

Potential locations of onsite swales and a diversion structure have been included within the proposed drainage maps in Appendix E. Calculations for existing and proposed conditions assume that offsite flows from the east will be diverted around the site, and those areas have not been included in the stormwater analysis within this report. If these offsite flows are not diverted, the onsite detention pond will require resizing to account for the additional stormwater volume.

References

1. *Pinal County Arizona Drainage Manual Volume I and II*, August 2004

2. *Urban Hydrology for Small Watersheds, Technical Release 55*; US Dept of Agriculture, Natural Resources Conservation Service, June 1986

3. *HEC-RAS River Analysis System v6.0 Beta User's Manual*; US Army Corps of Engineers Hydrologic Engineering Center, December, 2020

4. *Stream Restoration Design Nation Engineering Handbook, Chapter 8 Threshold Channel Design*; Natural Resource Conservation Service, August, 2007

5. *Field Techniques for Estimating Water Fluxes Between Surface Water and Ground Water;* Charles J. Taylor and Earl A. Green, U.S. Geological Survey, 2008

6. *Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance-Third Edition, Volume 2, HEC No. 23*, US Department of Transportation Federal Highway Administration, September 2009

Appendix A - Site Information

Soils Map

FEMA FIRM Map

USGS Rainfall Data

Rainfall Distribution

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Pinal County, Arizona, Western Part



May 14, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

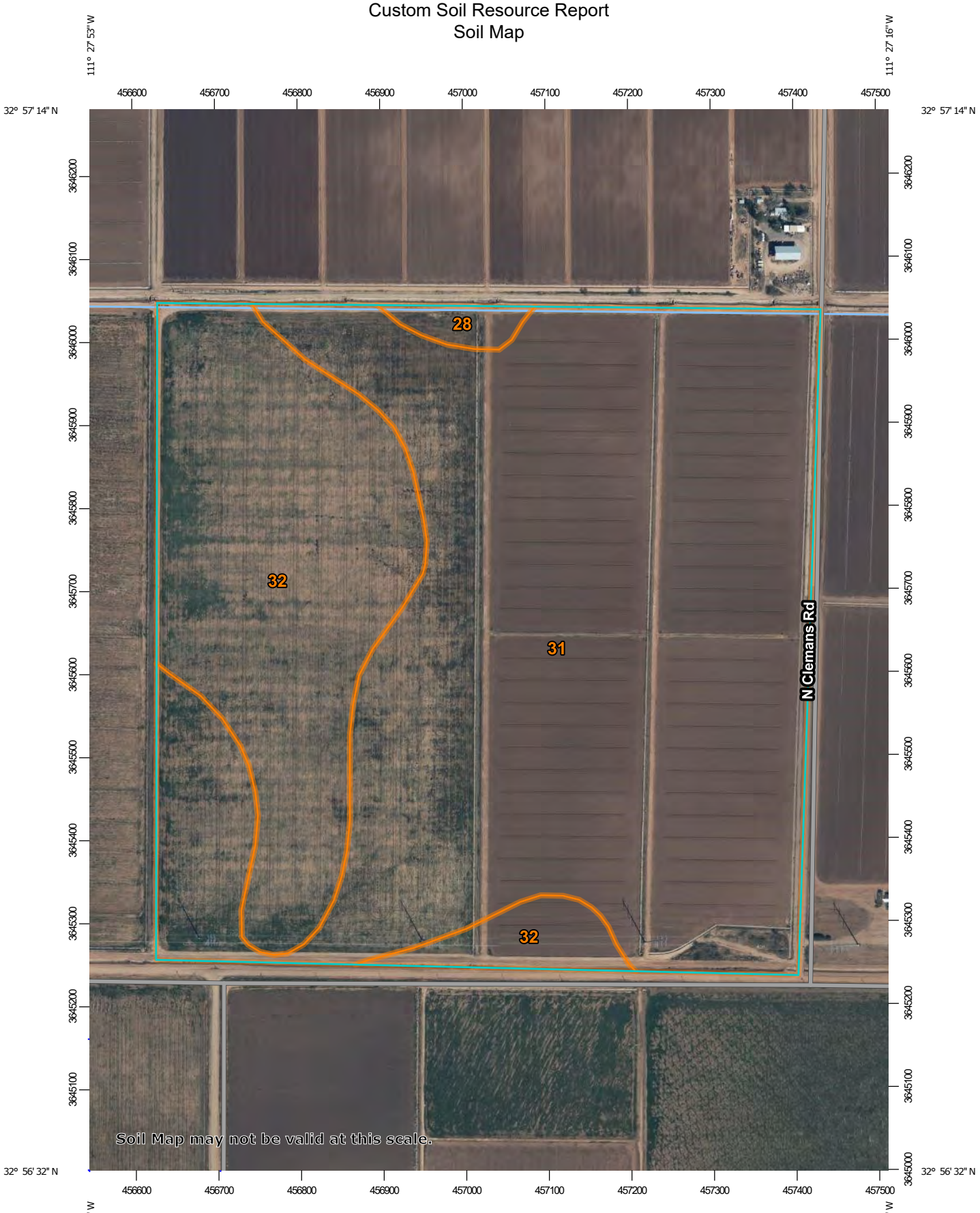
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:6,240 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pinal County, Arizona, Western Part
Survey Area Data: Version 20, Sep 8, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 18, 2020—Mar 7, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
28	Laveen loam	1.7	1.1%
31	Mohall loam MLRA 40	110.6	70.8%
32	Mohall clay loam	44.0	28.1%
Totals for Area of Interest		**156.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Pinal County, Arizona, Western Part

28—Laveen loam

Map Unit Setting

National map unit symbol: 1sqj
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Laveen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laveen

Setting

Landform: Stream terraces, fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed stream and fan alluvium

Typical profile

Ap - 0 to 15 inches: loam
Bk1 - 15 to 42 inches: loam
Bk2 - 42 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 40.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R040XB207AZ - Limy Fan 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

31—Mohall loam MLRA 40

Map Unit Setting

National map unit symbol: 2rfkt
Elevation: 1,000 to 1,990 feet
Mean annual precipitation: 6 to 10 inches
Mean annual air temperature: 68 to 74 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Mohall and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Stream terraces, basin floors, fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, flat
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 16 inches: loam
Bt - 16 to 24 inches: clay loam
Btk1 - 24 to 37 inches: clay loam
Btk2 - 37 to 43 inches: clay loam
Bk - 43 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB213AZ - Loamy Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 20 percent
Hydric soil rating: No

32—Mohall clay loam

Map Unit Setting

National map unit symbol: 1sqp
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Mohall and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Fan terraces, basin floors
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed fan alluvium

Typical profile

Ap - 0 to 16 inches: clay loam
Btk - 16 to 43 inches: clay loam
Bk - 43 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB205AZ - Clay Loam Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

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National Flood Hazard Layer FIRMette

FEMA

111°27'55"W 32°57'11"N



111°27'17"W 32°56'41"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

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
- 17.5 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

N

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 1/10/2024 at 11:24 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 date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

NOAA Atlas 14, Volume 1, Version 5
Location name: Coolidge, Arizona, USA*
Latitude: 32.9526°, Longitude: -111.4634°
Elevation: 1494 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.206 (0.177-0.245)	0.269 (0.233-0.320)	0.366 (0.314-0.433)	0.439 (0.375-0.516)	0.538 (0.453-0.630)	0.613 (0.508-0.715)	0.690 (0.564-0.804)	0.769 (0.617-0.897)	0.872 (0.681-1.02)	0.952 (0.728-1.12)
10-min	0.314 (0.270-0.373)	0.410 (0.355-0.487)	0.557 (0.478-0.658)	0.668 (0.571-0.786)	0.819 (0.689-0.958)	0.933 (0.774-1.09)	1.05 (0.858-1.22)	1.17 (0.938-1.36)	1.33 (1.04-1.55)	1.45 (1.11-1.71)
15-min	0.389 (0.335-0.462)	0.508 (0.440-0.604)	0.690 (0.592-0.816)	0.828 (0.707-0.974)	1.02 (0.854-1.19)	1.16 (0.959-1.35)	1.30 (1.06-1.52)	1.45 (1.16-1.69)	1.64 (1.29-1.93)	1.80 (1.37-2.12)
30-min	0.523 (0.451-0.622)	0.684 (0.593-0.813)	0.930 (0.797-1.10)	1.12 (0.953-1.31)	1.37 (1.15-1.60)	1.56 (1.29-1.82)	1.75 (1.43-2.04)	1.95 (1.57-2.28)	2.21 (1.73-2.59)	2.42 (1.85-2.85)
60-min	0.647 (0.558-0.770)	0.846 (0.734-1.01)	1.15 (0.987-1.36)	1.38 (1.18-1.62)	1.69 (1.42-1.98)	1.93 (1.60-2.25)	2.17 (1.77-2.53)	2.42 (1.94-2.82)	2.74 (2.14-3.21)	2.99 (2.29-3.53)
2-hr	0.748 (0.648-0.876)	0.970 (0.841-1.14)	1.30 (1.12-1.52)	1.54 (1.32-1.80)	1.88 (1.58-2.18)	2.14 (1.78-2.48)	2.41 (1.97-2.78)	2.68 (2.15-3.10)	3.04 (2.38-3.53)	3.33 (2.55-3.89)
3-hr	0.811 (0.702-0.949)	1.04 (0.901-1.22)	1.37 (1.18-1.60)	1.62 (1.39-1.89)	1.98 (1.68-2.30)	2.27 (1.88-2.62)	2.57 (2.10-2.97)	2.88 (2.31-3.33)	3.31 (2.58-3.84)	3.66 (2.78-4.26)
6-hr	0.980 (0.864-1.13)	1.24 (1.09-1.43)	1.59 (1.40-1.83)	1.86 (1.63-2.14)	2.25 (1.94-2.56)	2.55 (2.16-2.90)	2.86 (2.38-3.25)	3.18 (2.60-3.62)	3.61 (2.88-4.12)	3.96 (3.07-4.53)
12-hr	1.12 (1.00-1.27)	1.42 (1.27-1.61)	1.80 (1.60-2.04)	2.10 (1.86-2.36)	2.51 (2.19-2.81)	2.82 (2.44-3.15)	3.14 (2.67-3.53)	3.47 (2.90-3.89)	3.91 (3.19-4.42)	4.24 (3.40-4.84)
24-hr	1.27 (1.15-1.40)	1.61 (1.47-1.78)	2.09 (1.90-2.30)	2.46 (2.23-2.71)	2.99 (2.69-3.28)	3.40 (3.04-3.72)	3.83 (3.39-4.19)	4.27 (3.76-4.68)	4.88 (4.24-5.37)	5.37 (4.61-5.91)
2-day	1.35 (1.22-1.49)	1.72 (1.56-1.91)	2.26 (2.04-2.50)	2.69 (2.42-2.96)	3.28 (2.94-3.62)	3.76 (3.35-4.14)	4.25 (3.76-4.69)	4.77 (4.19-5.28)	5.50 (4.77-6.10)	6.08 (5.21-6.77)
3-day	1.43 (1.30-1.58)	1.82 (1.66-2.02)	2.40 (2.17-2.64)	2.85 (2.58-3.14)	3.50 (3.14-3.85)	4.02 (3.59-4.42)	4.56 (4.04-5.02)	5.14 (4.52-5.67)	5.95 (5.16-6.58)	6.60 (5.67-7.33)
4-day	1.51 (1.38-1.67)	1.92 (1.75-2.12)	2.53 (2.30-2.79)	3.02 (2.74-3.32)	3.72 (3.34-4.09)	4.28 (3.82-4.70)	4.87 (4.32-5.36)	5.50 (4.84-6.06)	6.40 (5.55-7.06)	7.12 (6.12-7.89)
7-day	1.68 (1.52-1.86)	2.14 (1.94-2.36)	2.81 (2.55-3.11)	3.36 (3.04-3.72)	4.13 (3.71-4.56)	4.76 (4.24-5.25)	5.42 (4.80-5.98)	6.12 (5.38-6.76)	7.12 (6.17-7.88)	7.92 (6.79-8.80)
10-day	1.82 (1.65-2.02)	2.33 (2.12-2.59)	3.06 (2.78-3.40)	3.65 (3.30-4.05)	4.48 (4.02-4.96)	5.14 (4.59-5.69)	5.84 (5.18-6.47)	6.58 (5.79-7.30)	7.61 (6.62-8.48)	8.45 (7.27-9.43)
20-day	2.25 (2.04-2.49)	2.90 (2.62-3.20)	3.81 (3.45-4.20)	4.51 (4.06-4.96)	5.44 (4.89-5.98)	6.16 (5.50-6.77)	6.89 (6.13-7.58)	7.63 (6.76-8.41)	8.63 (7.57-9.54)	9.40 (8.18-10.4)
30-day	2.65 (2.42-2.90)	3.40 (3.11-3.72)	4.46 (4.08-4.88)	5.28 (4.81-5.76)	6.36 (5.76-6.94)	7.20 (6.49-7.85)	8.05 (7.23-8.79)	8.92 (7.96-9.76)	10.1 (8.92-11.1)	11.0 (9.64-12.1)
45-day	3.08 (2.82-3.38)	3.97 (3.62-4.36)	5.21 (4.75-5.71)	6.12 (5.57-6.71)	7.33 (6.64-8.02)	8.24 (7.43-9.02)	9.15 (8.22-10.0)	10.1 (8.99-11.0)	11.2 (9.98-12.4)	12.1 (10.7-13.4)
60-day	3.43 (3.14-3.76)	4.42 (4.04-4.84)	5.79 (5.28-6.33)	6.78 (6.18-7.40)	8.07 (7.33-8.80)	9.03 (8.16-9.85)	9.98 (8.99-10.9)	10.9 (9.78-11.9)	12.1 (10.8-13.3)	13.0 (11.5-14.3)

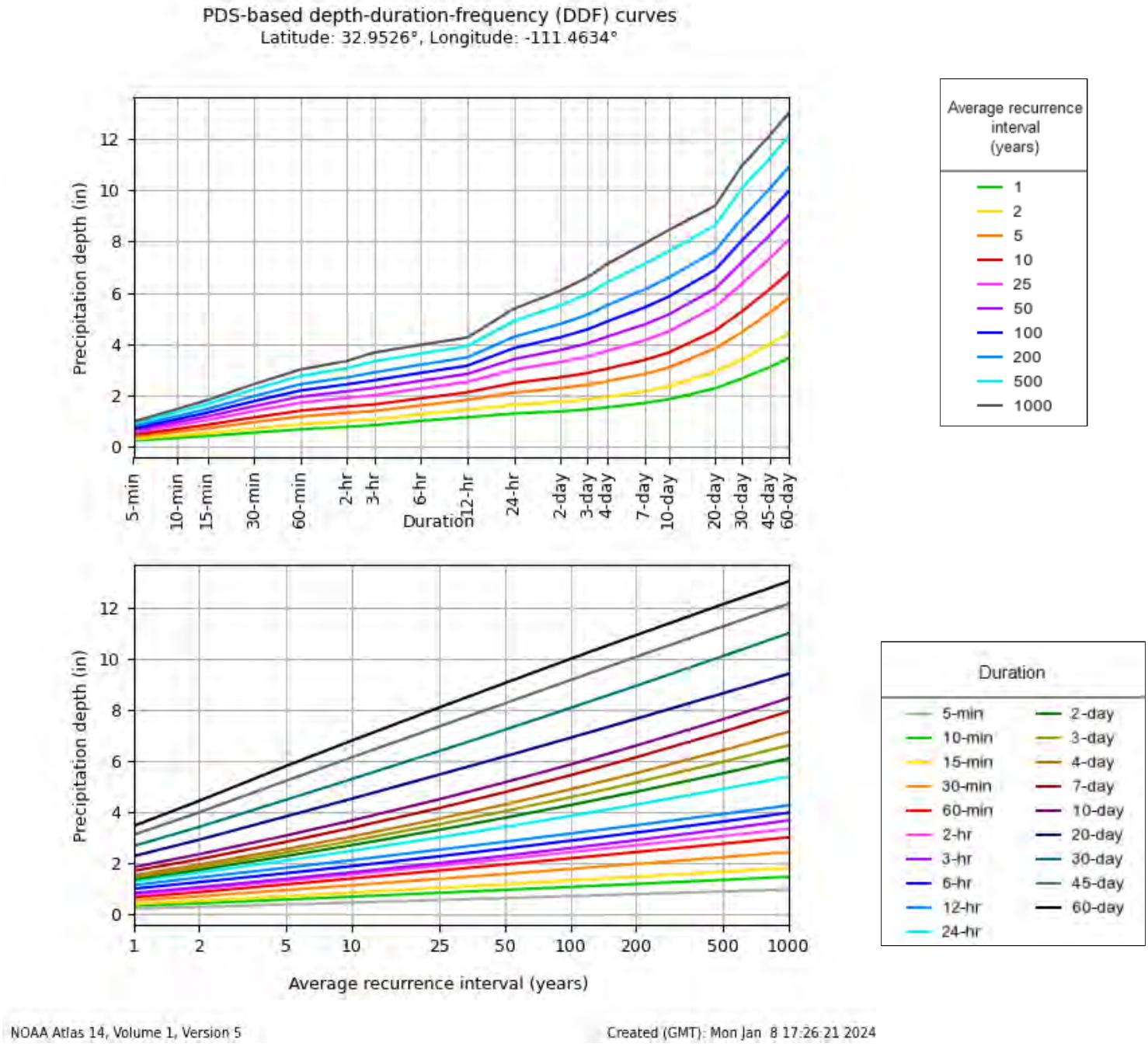
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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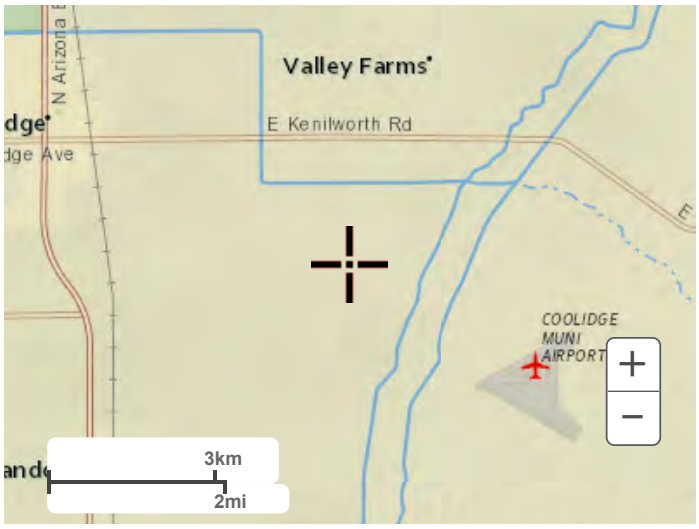
PF graphical



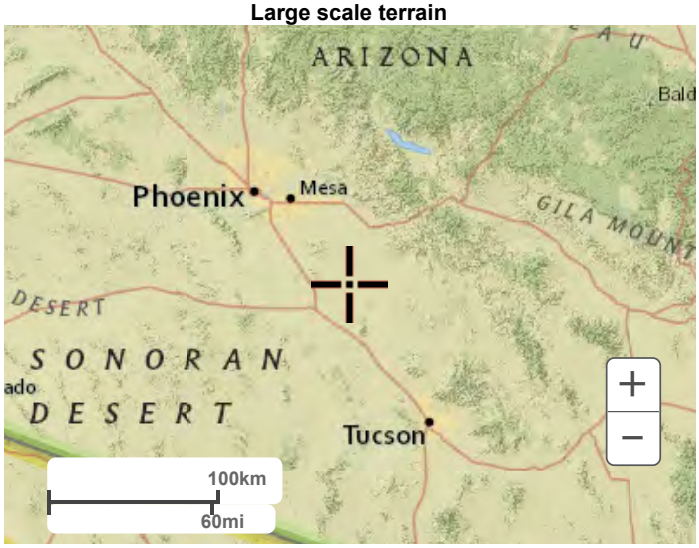
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Maps & aerials

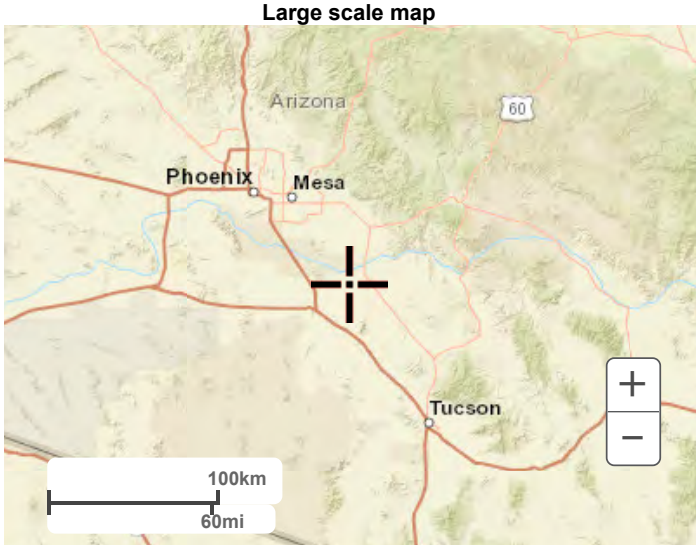
Small scale terrain



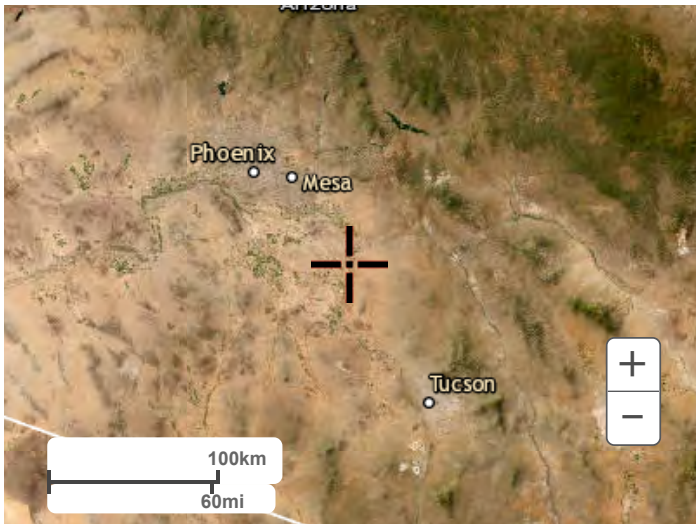
Large scale terrain



Large scale map



Large scale aerial



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Disclaimer

Rainfall Distribution

Time	Time	Type II		10-Year		25-Year		50-Year		100-Year		500-Year	
Hrs	HH : MM	%		Depth=	2.46	Depth=	2.99	Depth=	3.4	Depth=	3.83	Depth=	4.88
0	00 : 00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	00 : 06	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004	0.005	0.005
0.2	00 : 12	0.002	0.001	0.005	0.002	0.006	0.003	0.007	0.003	0.008	0.004	0.010	0.005
0.3	00 : 18	0.003	0.001	0.008	0.003	0.009	0.003	0.010	0.004	0.012	0.004	0.015	0.005
0.4	00 : 24	0.004	0.001	0.010	0.003	0.012	0.003	0.014	0.004	0.016	0.004	0.020	0.005
0.5	00 : 30	0.005	0.001	0.013	0.003	0.015	0.003	0.017	0.004	0.020	0.004	0.025	0.005
0.6	00 : 36	0.006	0.001	0.015	0.003	0.018	0.003	0.021	0.004	0.024	0.004	0.030	0.005
0.7	00 : 42	0.007	0.001	0.018	0.003	0.022	0.003	0.025	0.004	0.028	0.004	0.035	0.005
0.8	00 : 48	0.008	0.001	0.020	0.003	0.025	0.003	0.028	0.004	0.032	0.004	0.041	0.005
0.9	00 : 54	0.009	0.001	0.023	0.003	0.028	0.003	0.032	0.004	0.036	0.004	0.046	0.005
1	01 : 00	0.011	0.001	0.026	0.003	0.031	0.003	0.036	0.004	0.040	0.004	0.051	0.005
1.1	01 : 06	0.012	0.001	0.029	0.003	0.035	0.003	0.039	0.004	0.044	0.004	0.057	0.005
1.2	01 : 12	0.013	0.001	0.031	0.003	0.038	0.003	0.043	0.004	0.049	0.004	0.062	0.005
1.3	01 : 18	0.014	0.001	0.034	0.003	0.041	0.003	0.047	0.004	0.053	0.004	0.068	0.006
1.4	01 : 24	0.015	0.001	0.037	0.003	0.045	0.003	0.051	0.004	0.057	0.004	0.073	0.006
1.5	01 : 30	0.016	0.001	0.040	0.003	0.048	0.003	0.055	0.004	0.062	0.004	0.079	0.006
1.6	01 : 36	0.017	0.001	0.043	0.003	0.052	0.003	0.059	0.004	0.066	0.004	0.084	0.006
1.7	01 : 42	0.018	0.001	0.045	0.003	0.055	0.003	0.063	0.004	0.071	0.004	0.090	0.006
1.8	01 : 48	0.020	0.001	0.048	0.003	0.059	0.003	0.067	0.004	0.075	0.004	0.096	0.006
1.9	01 : 54	0.021	0.001	0.051	0.003	0.062	0.004	0.071	0.004	0.080	0.005	0.102	0.006
2	02 : 00	0.022	0.001	0.054	0.003	0.066	0.004	0.075	0.004	0.084	0.005	0.107	0.006
2.1	02 : 06	0.023	0.001	0.057	0.003	0.069	0.004	0.079	0.004	0.089	0.005	0.113	0.006
2.2	02 : 12	0.024	0.001	0.060	0.003	0.073	0.004	0.083	0.004	0.094	0.005	0.119	0.006
2.3	02 : 18	0.026	0.001	0.063	0.003	0.077	0.004	0.087	0.004	0.098	0.005	0.125	0.006
2.4	02 : 24	0.027	0.001	0.066	0.003	0.080	0.004	0.091	0.004	0.103	0.005	0.131	0.006
2.5	02 : 30	0.028	0.001	0.069	0.003	0.084	0.004	0.096	0.004	0.108	0.005	0.137	0.006
2.6	02 : 36	0.029	0.001	0.072	0.003	0.088	0.004	0.100	0.004	0.113	0.005	0.143	0.006
2.7	02 : 42	0.031	0.001	0.075	0.003	0.092	0.004	0.104	0.004	0.117	0.005	0.150	0.006
2.8	02 : 48	0.032	0.001	0.079	0.003	0.095	0.004	0.109	0.004	0.122	0.005	0.156	0.006
2.9	02 : 54	0.033	0.001	0.082	0.003	0.099	0.004	0.113	0.004	0.127	0.005	0.162	0.006
3	03 : 00	0.035	0.001	0.085	0.003	0.103	0.004	0.117	0.004	0.132	0.005	0.168	0.006
3.1	03 : 06	0.036	0.001	0.088	0.003	0.107	0.004	0.122	0.004	0.137	0.005	0.175	0.006
3.2	03 : 12	0.037	0.001	0.091	0.003	0.111	0.004	0.126	0.004	0.142	0.005	0.181	0.006
3.3	03 : 18	0.038	0.001	0.095	0.003	0.115	0.004	0.131	0.005	0.147	0.005	0.188	0.006
3.4	03 : 24	0.040	0.001	0.098	0.003	0.119	0.004	0.135	0.005	0.152	0.005	0.194	0.006
3.5	03 : 30	0.041	0.001	0.101	0.003	0.123	0.004	0.140	0.005	0.158	0.005	0.201	0.007
3.6	03 : 36	0.042	0.001	0.105	0.003	0.127	0.004	0.144	0.005	0.163	0.005	0.207	0.007
3.7	03 : 42	0.044	0.001	0.108	0.003	0.131	0.004	0.149	0.005	0.168	0.005	0.214	0.007
3.8	03 : 48	0.045	0.001	0.111	0.003	0.135	0.004	0.154	0.005	0.173	0.005	0.221	0.007
3.9	03 : 54	0.047	0.001	0.115	0.003	0.139	0.004	0.158	0.005	0.179	0.005	0.227	0.007
4	04 : 00	0.048	0.001	0.118	0.003	0.144	0.004	0.163	0.005	0.184	0.005	0.234	0.007
4.1	04 : 06	0.049	0.001	0.122	0.003	0.148	0.004	0.168	0.005	0.189	0.005	0.241	0.007
4.2	04 : 12	0.051	0.001	0.125	0.004	0.152	0.004	0.173	0.005	0.195	0.005	0.248	0.007
4.3	04 : 18	0.052	0.001	0.129	0.004	0.156	0.004	0.178	0.005	0.200	0.006	0.255	0.007
4.4	04 : 24	0.054	0.001	0.132	0.004	0.161	0.004	0.183	0.005	0.206	0.006	0.262	0.007
4.5	04 : 30	0.055	0.001	0.136	0.004	0.165	0.004	0.188	0.005	0.212	0.006	0.270	0.007
4.6	04 : 36	0.057	0.002	0.140	0.004	0.170	0.005	0.193	0.005	0.217	0.006	0.277	0.007
4.7	04 : 42	0.058	0.002	0.143	0.004	0.174	0.005	0.198	0.005	0.223	0.006	0.284	0.007
4.8	04 : 48	0.060	0.002	0.147	0.004	0.179	0.005	0.203	0.005	0.229	0.006	0.292	0.008
4.9	04 : 54	0.061	0.002	0.151	0.004	0.184	0.005	0.209	0.005	0.235	0.006	0.300	0.008
5	05 : 00	0.063	0.002	0.155	0.004	0.188	0.005	0.214	0.005	0.241	0.006	0.307	0.008
5.1	05 : 06	0.065	0.002	0.159	0.004	0.193	0.005	0.220	0.005	0.247	0.006	0.315	0.008
5.2	05 : 12	0.066	0.002	0.163	0.004	0.198	0.005	0.225	0.006	0.254	0.006	0.323	0.008
5.3	05 : 18	0.068	0.002	0.167	0.004	0.203	0.005	0.231	0.006	0.260	0.006	0.331	0.008
5.4	05 : 24	0.070	0.002	0.171	0.004	0.208	0.005	0.237	0.006	0.266	0.006	0.339	0.008
5.5	05 : 30	0.071	0.002	0.175	0.004	0.213	0.005	0.242	0.006	0.273	0.006	0.348	0.008
5.6	05 : 36	0.073	0.002	0.179	0.004	0.218	0.005	0.248	0.006	0.279	0.007	0.356	0.008
5.7	05 : 42	0.075	0.002	0.184	0.004	0.223	0.005	0.254	0.006	0.286	0.007	0.364	0.008
5.8	05 : 48	0.076	0.002	0.188	0.004	0.229	0.005	0.260	0.006	0.293	0.007	0.373	0.009
5.9	05 : 54	0.078	0.002	0.192	0.004	0.234	0.005	0.266	0.006	0.300	0.007	0.382	0.009
6	05 : 60	0.080	0.002	0.197	0.004	0.239	0.005	0.272	0.006	0.306	0.007	0.390	0.009
6.1	06 : 06	0.082	0.002	0.201	0.004	0.245	0.005	0.278	0.006	0.313	0.007	0.399	0.009
6.2	06 : 12	0.084	0.002	0.206	0.005	0.250	0.005	0.284	0.006	0.320	0.007	0.408	0.009
6.3	06 : 18	0.085	0.002	0.210	0.005	0.256	0.006	0.291	0.006	0.327	0.007	0.417	0.009

Time	Time	Type II		10-Year		25-Year		50-Year		100-Year		500-Year	
Hrs	HH : MM	%		Depth=	2.46	Depth=	2.99	Depth=	3.4	Depth=	3.83	Depth=	4.88
6.4	06 : 24	0.087	0.002	0.215	0.005	0.261	0.006	0.297	0.006	0.335	0.007	0.426	0.009
6.5	06 : 30	0.089	0.002	0.220	0.005	0.267	0.006	0.303	0.006	0.342	0.007	0.436	0.009
6.6	06 : 36	0.091	0.002	0.224	0.005	0.273	0.006	0.310	0.006	0.349	0.007	0.445	0.009
6.7	06 : 42	0.093	0.002	0.229	0.005	0.278	0.006	0.317	0.007	0.357	0.007	0.454	0.009
6.8	06 : 48	0.095	0.002	0.234	0.005	0.284	0.006	0.323	0.007	0.364	0.007	0.464	0.010
6.9	06 : 54	0.097	0.002	0.239	0.005	0.290	0.006	0.330	0.007	0.372	0.008	0.473	0.010
7	06 : 60	0.099	0.002	0.244	0.005	0.296	0.006	0.337	0.007	0.379	0.008	0.483	0.010
7.1	07 : 06	0.101	0.002	0.248	0.005	0.302	0.006	0.343	0.007	0.387	0.008	0.493	0.010
7.2	07 : 12	0.103	0.002	0.253	0.005	0.308	0.006	0.350	0.007	0.395	0.008	0.503	0.010
7.3	07 : 18	0.105	0.002	0.259	0.005	0.314	0.006	0.357	0.007	0.402	0.008	0.513	0.010
7.4	07 : 24	0.107	0.002	0.264	0.005	0.320	0.006	0.364	0.007	0.410	0.008	0.523	0.010
7.5	07 : 30	0.109	0.002	0.269	0.005	0.327	0.006	0.371	0.007	0.418	0.008	0.533	0.010
7.6	07 : 36	0.111	0.002	0.274	0.005	0.333	0.006	0.379	0.007	0.427	0.008	0.543	0.010
7.7	07 : 42	0.113	0.002	0.279	0.005	0.339	0.006	0.386	0.007	0.435	0.008	0.554	0.010
7.8	07 : 48	0.116	0.002	0.284	0.005	0.346	0.006	0.393	0.007	0.443	0.008	0.564	0.010
7.9	07 : 54	0.118	0.002	0.290	0.005	0.352	0.006	0.401	0.007	0.451	0.008	0.575	0.011
8	07 : 60	0.120	0.002	0.295	0.005	0.359	0.007	0.408	0.007	0.460	0.008	0.586	0.011
8.1	08 : 06	0.122	0.002	0.301	0.006	0.366	0.007	0.416	0.008	0.468	0.009	0.597	0.011
8.2	08 : 12	0.125	0.002	0.307	0.006	0.373	0.007	0.424	0.008	0.477	0.009	0.608	0.011
8.3	08 : 18	0.127	0.002	0.313	0.006	0.380	0.007	0.432	0.008	0.487	0.009	0.620	0.012
8.4	08 : 24	0.130	0.003	0.319	0.006	0.388	0.008	0.441	0.009	0.496	0.010	0.632	0.012
8.5	08 : 30	0.132	0.003	0.325	0.007	0.395	0.008	0.450	0.009	0.507	0.010	0.645	0.013
8.6	08 : 36	0.135	0.003	0.332	0.007	0.404	0.008	0.459	0.009	0.517	0.011	0.659	0.013
8.7	08 : 42	0.138	0.003	0.339	0.007	0.412	0.009	0.469	0.010	0.528	0.011	0.673	0.014
8.8	08 : 48	0.141	0.003	0.346	0.007	0.421	0.009	0.479	0.010	0.539	0.011	0.687	0.014
8.9	08 : 54	0.144	0.003	0.354	0.008	0.430	0.009	0.489	0.010	0.551	0.012	0.702	0.015
9	08 : 60	0.147	0.003	0.362	0.008	0.440	0.009	0.500	0.011	0.563	0.012	0.717	0.015
9.1	09 : 06	0.150	0.003	0.369	0.008	0.449	0.010	0.511	0.011	0.575	0.012	0.733	0.016
9.2	09 : 12	0.153	0.003	0.377	0.008	0.459	0.010	0.522	0.011	0.588	0.012	0.749	0.016
9.3	09 : 18	0.157	0.003	0.385	0.008	0.468	0.010	0.532	0.011	0.600	0.012	0.764	0.016
9.4	09 : 24	0.160	0.003	0.393	0.008	0.478	0.010	0.543	0.011	0.612	0.012	0.780	0.016
9.5	09 : 30	0.163	0.003	0.401	0.008	0.487	0.010	0.554	0.011	0.624	0.012	0.795	0.016
9.6	09 : 36	0.166	0.003	0.409	0.008	0.497	0.010	0.565	0.011	0.637	0.013	0.811	0.016
9.7	09 : 42	0.170	0.003	0.418	0.008	0.507	0.010	0.577	0.012	0.650	0.013	0.828	0.017
9.8	09 : 48	0.173	0.004	0.426	0.009	0.518	0.011	0.589	0.012	0.664	0.014	0.846	0.018
9.9	09 : 54	0.177	0.004	0.436	0.009	0.529	0.011	0.602	0.013	0.678	0.014	0.864	0.018
10	09 : 60	0.181	0.004	0.445	0.010	0.541	0.012	0.615	0.013	0.693	0.015	0.883	0.019
10.1	10 : 06	0.185	0.004	0.455	0.010	0.554	0.012	0.629	0.014	0.709	0.016	0.903	0.020
10.2	10 : 12	0.189	0.004	0.466	0.011	0.567	0.013	0.644	0.015	0.726	0.017	0.925	0.021
10.3	10 : 18	0.194	0.005	0.477	0.011	0.580	0.014	0.660	0.016	0.743	0.018	0.947	0.022
10.4	10 : 24	0.199	0.005	0.489	0.012	0.595	0.014	0.676	0.016	0.762	0.019	0.971	0.024
10.5	10 : 30	0.204	0.005	0.502	0.012	0.610	0.015	0.694	0.017	0.781	0.019	0.996	0.025
10.6	10 : 36	0.209	0.005	0.515	0.013	0.626	0.016	0.712	0.018	0.802	0.021	1.022	0.026
10.7	10 : 42	0.215	0.006	0.529	0.014	0.643	0.017	0.732	0.020	0.824	0.022	1.050	0.028
10.8	10 : 48	0.221	0.006	0.545	0.015	0.662	0.019	0.753	0.021	0.848	0.024	1.080	0.030
10.9	10 : 54	0.228	0.007	0.561	0.016	0.682	0.020	0.775	0.022	0.873	0.025	1.113	0.032
11	11 : 00	0.235	0.007	0.578	0.017	0.703	0.021	0.799	0.024	0.900	0.027	1.147	0.034
11.1	11 : 06	0.243	0.008	0.597	0.019	0.726	0.023	0.825	0.026	0.929	0.029	1.184	0.037
11.2	11 : 12	0.251	0.009	0.618	0.021	0.751	0.026	0.854	0.029	0.963	0.033	1.226	0.042
11.3	11 : 18	0.261	0.010	0.642	0.024	0.780	0.029	0.887	0.033	0.999	0.037	1.273	0.047
11.4	11 : 24	0.271	0.011	0.668	0.026	0.812	0.032	0.923	0.036	1.040	0.040	1.325	0.052
11.5	11 : 30	0.283	0.012	0.696	0.028	0.846	0.034	0.962	0.039	1.084	0.044	1.381	0.056
11.6	11 : 36	0.307	0.024	0.755	0.059	0.917	0.071	1.043	0.081	1.175	0.091	1.497	0.116
11.7	11 : 42	0.354	0.048	0.872	0.117	1.060	0.142	1.205	0.162	1.357	0.182	1.729	0.232
11.8	11 : 48	0.431	0.076	1.060	0.188	1.288	0.229	1.465	0.260	1.650	0.293	2.102	0.373
11.9	11 : 54	0.568	0.137	1.397	0.337	1.698	0.410	1.931	0.466	2.175	0.525	2.771	0.669
12	12 : 00	0.663	0.095	1.631	0.234	1.982	0.284	2.254	0.323	2.539	0.364	3.235	0.464
12.1	12 : 06	0.682	0.019	1.678	0.047	2.039	0.057	2.319	0.064	2.612	0.073	3.328	0.093
12.2	12 : 12	0.699	0.017	1.719	0.041	2.089	0.050	2.375	0.057	2.676	0.064	3.409	0.081
12.3	12 : 18	0.713	0.014	1.754	0.035	2.132	0.043	2.424	0.049	2.731	0.055	3.480	0.070
12.4	12 : 24	0.725	0.012	1.784	0.030	2.168	0.036	2.466	0.041	2.777	0.046	3.539	0.059
12.5	12 : 30	0.735	0.010	1.808	0.024	2.198	0.029	2.499	0.033	2.815	0.038	3.587	0.048
12.6	12 : 36	0.743	0.008	1.829	0.021	2.223	0.025	2.528	0.029	2.847	0.032	3.628	0.041
12.7	12 : 42	0.751	0.008	1.848	0.019	2.247	0.024	2.555	0.027	2.878	0.030	3.667	0.039
12.8	12 : 48	0.759	0.007	1.867	0.018	2.269	0.022	2.580	0.025	2.906	0.028	3.703	0.036
12.9	12 : 54	0.766	0.007	1.883	0.017	2.289	0.021	2.603	0.023	2.932	0.026	3.736	0.034

Time	Time	Type II		10-Year		25-Year		50-Year		100-Year		500-Year	
Hrs	HH : MM	%		Depth=	2.46	Depth=	2.99	Depth=	3.4	Depth=	3.83	Depth=	4.88
13	13 : 00	0.772	0.006	1.899	0.016	2.308	0.019	2.625	0.022	2.957	0.024	3.767	0.031
13.1	13 : 06	0.778	0.006	1.914	0.015	2.326	0.018	2.645	0.020	2.980	0.023	3.796	0.029
13.2	13 : 12	0.784	0.006	1.928	0.014	2.343	0.017	2.664	0.019	3.001	0.022	3.824	0.028
13.3	13 : 18	0.789	0.005	1.941	0.013	2.359	0.016	2.683	0.018	3.022	0.021	3.851	0.026
13.4	13 : 24	0.794	0.005	1.954	0.013	2.375	0.015	2.700	0.017	3.042	0.020	3.876	0.025
13.5	13 : 30	0.799	0.005	1.966	0.012	2.389	0.014	2.717	0.016	3.060	0.019	3.899	0.024
13.6	13 : 36	0.804	0.005	1.977	0.011	2.403	0.014	2.732	0.016	3.078	0.018	3.922	0.022
13.7	13 : 42	0.808	0.004	1.988	0.011	2.416	0.013	2.747	0.015	3.095	0.017	3.943	0.021
13.8	13 : 48	0.812	0.004	1.998	0.010	2.428	0.013	2.761	0.014	3.111	0.016	3.964	0.020
13.9	13 : 54	0.816	0.004	2.008	0.010	2.440	0.012	2.775	0.014	3.126	0.015	3.983	0.020
14	14 : 00	0.820	0.004	2.017	0.009	2.452	0.011	2.788	0.013	3.141	0.015	4.002	0.019
14.1	14 : 06	0.824	0.004	2.026	0.009	2.463	0.011	2.800	0.012	3.155	0.014	4.020	0.018
14.2	14 : 12	0.827	0.004	2.035	0.009	2.474	0.011	2.813	0.012	3.168	0.014	4.037	0.018
14.3	14 : 18	0.831	0.004	2.044	0.009	2.484	0.011	2.825	0.012	3.182	0.014	4.054	0.017
14.4	14 : 24	0.834	0.003	2.052	0.008	2.494	0.010	2.836	0.012	3.195	0.013	4.071	0.017
14.5	14 : 30	0.838	0.003	2.061	0.008	2.505	0.010	2.848	0.012	3.208	0.013	4.088	0.017
14.6	14 : 36	0.841	0.003	2.069	0.008	2.514	0.010	2.859	0.011	3.221	0.013	4.104	0.016
14.7	14 : 42	0.844	0.003	2.077	0.008	2.524	0.010	2.870	0.011	3.233	0.012	4.120	0.016
14.8	14 : 48	0.847	0.003	2.085	0.008	2.534	0.009	2.881	0.011	3.245	0.012	4.135	0.015
14.9	14 : 54	0.850	0.003	2.092	0.008	2.543	0.009	2.892	0.011	3.257	0.012	4.150	0.015
15	15 : 00	0.854	0.003	2.100	0.007	2.552	0.009	2.902	0.010	3.269	0.012	4.165	0.015
15.1	15 : 06	0.856	0.003	2.107	0.007	2.561	0.009	2.912	0.010	3.280	0.011	4.180	0.014
15.2	15 : 12	0.859	0.003	2.114	0.007	2.569	0.009	2.922	0.010	3.291	0.011	4.194	0.014
15.3	15 : 18	0.862	0.003	2.121	0.007	2.578	0.008	2.931	0.010	3.302	0.011	4.207	0.014
15.4	15 : 24	0.865	0.003	2.128	0.007	2.586	0.008	2.941	0.009	3.313	0.011	4.221	0.013
15.5	15 : 30	0.868	0.003	2.134	0.007	2.594	0.008	2.950	0.009	3.323	0.010	4.234	0.013
15.6	15 : 36	0.870	0.003	2.141	0.006	2.602	0.008	2.959	0.009	3.333	0.010	4.247	0.013
15.7	15 : 42	0.873	0.003	2.147	0.006	2.610	0.008	2.967	0.009	3.343	0.010	4.259	0.012
15.8	15 : 48	0.875	0.002	2.153	0.006	2.617	0.007	2.976	0.008	3.352	0.009	4.271	0.012
15.9	15 : 54	0.878	0.002	2.159	0.006	2.624	0.007	2.984	0.008	3.361	0.009	4.283	0.012
16	16 : 00	0.880	0.002	2.165	0.006	2.631	0.007	2.992	0.008	3.370	0.009	4.294	0.011
16.1	16 : 06	0.882	0.002	2.170	0.006	2.638	0.007	3.000	0.008	3.379	0.009	4.306	0.011
16.2	16 : 12	0.885	0.002	2.176	0.006	2.645	0.007	3.007	0.008	3.388	0.009	4.317	0.011
16.3	16 : 18	0.887	0.002	2.182	0.006	2.652	0.007	3.015	0.008	3.396	0.009	4.328	0.011
16.4	16 : 24	0.889	0.002	2.187	0.005	2.658	0.007	3.023	0.008	3.405	0.008	4.338	0.011
16.5	16 : 30	0.891	0.002	2.192	0.005	2.665	0.007	3.030	0.007	3.413	0.008	4.349	0.011
16.6	16 : 36	0.893	0.002	2.198	0.005	2.671	0.006	3.037	0.007	3.422	0.008	4.360	0.011
16.7	16 : 42	0.895	0.002	2.203	0.005	2.678	0.006	3.045	0.007	3.430	0.008	4.370	0.010
16.8	16 : 48	0.898	0.002	2.208	0.005	2.684	0.006	3.052	0.007	3.438	0.008	4.380	0.010
16.9	16 : 54	0.900	0.002	2.213	0.005	2.690	0.006	3.059	0.007	3.446	0.008	4.390	0.010
17	17 : 00	0.902	0.002	2.218	0.005	2.696	0.006	3.066	0.007	3.454	0.008	4.401	0.010
17.1	17 : 06	0.904	0.002	2.223	0.005	2.702	0.006	3.073	0.007	3.462	0.008	4.410	0.010
17.2	17 : 12	0.906	0.002	2.228	0.005	2.708	0.006	3.080	0.007	3.469	0.008	4.420	0.010
17.3	17 : 18	0.908	0.002	2.233	0.005	2.714	0.006	3.086	0.007	3.477	0.008	4.430	0.010
17.4	17 : 24	0.910	0.002	2.238	0.005	2.720	0.006	3.093	0.007	3.484	0.008	4.440	0.010
17.5	17 : 30	0.912	0.002	2.243	0.005	2.726	0.006	3.100	0.007	3.492	0.007	4.449	0.009
17.6	17 : 36	0.914	0.002	2.247	0.005	2.732	0.006	3.106	0.006	3.499	0.007	4.458	0.009
17.7	17 : 42	0.915	0.002	2.252	0.005	2.737	0.006	3.113	0.006	3.506	0.007	4.468	0.009
17.8	17 : 48	0.917	0.002	2.257	0.005	2.743	0.006	3.119	0.006	3.513	0.007	4.477	0.009
17.9	17 : 54	0.919	0.002	2.261	0.005	2.748	0.006	3.125	0.006	3.520	0.007	4.486	0.009
18	18 : 00	0.921	0.002	2.266	0.004	2.754	0.005	3.131	0.006	3.527	0.007	4.494	0.009
18.1	18 : 06	0.923	0.002	2.270	0.004	2.759	0.005	3.137	0.006	3.534	0.007	4.503	0.009
18.2	18 : 12	0.925	0.002	2.274	0.004	2.764	0.005	3.143	0.006	3.541	0.007	4.512	0.009
18.3	18 : 18	0.926	0.002	2.279	0.004	2.770	0.005	3.149	0.006	3.548	0.007	4.520	0.008
18.4	18 : 24	0.928	0.002	2.283	0.004	2.775	0.005	3.155	0.006	3.554	0.007	4.529	0.008
18.5	18 : 30	0.930	0.002	2.287	0.004	2.780	0.005	3.161	0.006	3.561	0.006	4.537	0.008
18.6	18 : 36	0.931	0.002	2.291	0.004	2.785	0.005	3.167	0.006	3.567	0.006	4.545	0.008
18.7	18 : 42	0.933	0.002	2.295	0.004	2.790	0.005	3.172	0.006	3.573	0.006	4.553	0.008
18.8	18 : 48	0.935	0.002	2.299	0.004	2.794	0.005	3.178	0.005	3.580	0.006	4.561	0.008
18.9	18 : 54	0.936	0.002	2.303	0.004	2.799	0.005	3.183	0.005	3.586	0.006	4.569	0.008
19	19 : 00	0.938	0.002	2.307	0.004	2.804	0.005	3.188	0.005	3.592	0.006	4.576	0.008
19.1	19 : 06	0.939	0.002	2.311	0.004	2.808	0.005	3.194	0.005	3.597	0.006	4.584	0.008
19.2	19 : 12	0.941	0.002	2.314	0.004	2.813	0.005	3.199	0.005	3.603	0.006	4.591	0.007
19.3	19 : 18	0.942	0.001	2.318	0.004	2.817	0.004	3.204	0.005	3.609	0.006	4.598	0.007
19.4	19 : 24	0.944	0.001	2.322	0.004	2.822	0.004	3.209	0.005	3.615	0.006	4.606	0.007
19.5	19 : 30	0.945	0.001	2.325	0.004	2.826	0.004	3.214	0.005	3.620	0.006	4.613	0.007

Time	Time	Type II		10-Year		25-Year		50-Year		100-Year		500-Year	
Hrs	HH : MM	%		Depth=	2.46	Depth=	2.99	Depth=	3.4	Depth=	3.83	Depth=	4.88
19.6	19 : 36	0.947	0.001	2.329	0.003	2.830	0.004	3.218	0.005	3.625	0.005	4.619	0.007
19.7	19 : 42	0.948	0.001	2.332	0.003	2.834	0.004	3.223	0.005	3.631	0.005	4.626	0.007
19.8	19 : 48	0.949	0.001	2.335	0.003	2.839	0.004	3.228	0.005	3.636	0.005	4.633	0.007
19.9	19 : 54	0.951	0.001	2.339	0.003	2.843	0.004	3.232	0.005	3.641	0.005	4.639	0.007
20	20 : 00	0.952	0.001	2.342	0.003	2.846	0.004	3.237	0.004	3.646	0.005	4.646	0.006
20.1	20 : 06	0.953	0.001	2.345	0.003	2.850	0.004	3.241	0.004	3.651	0.005	4.652	0.006
20.2	20 : 12	0.955	0.001	2.348	0.003	2.854	0.004	3.246	0.004	3.656	0.005	4.658	0.006
20.3	20 : 18	0.956	0.001	2.351	0.003	2.858	0.004	3.250	0.004	3.661	0.005	4.665	0.006
20.4	20 : 24	0.957	0.001	2.355	0.003	2.862	0.004	3.254	0.004	3.666	0.005	4.671	0.006
20.5	20 : 30	0.958	0.001	2.358	0.003	2.866	0.004	3.259	0.004	3.671	0.005	4.677	0.006
20.6	20 : 36	0.960	0.001	2.361	0.003	2.870	0.004	3.263	0.004	3.676	0.005	4.683	0.006
20.7	20 : 42	0.961	0.001	2.364	0.003	2.873	0.004	3.267	0.004	3.681	0.005	4.690	0.006
20.8	20 : 48	0.962	0.001	2.367	0.003	2.877	0.004	3.272	0.004	3.685	0.005	4.696	0.006
20.9	20 : 54	0.964	0.001	2.370	0.003	2.881	0.004	3.276	0.004	3.690	0.005	4.702	0.006
21	21 : 00	0.965	0.001	2.373	0.003	2.885	0.004	3.280	0.004	3.695	0.005	4.708	0.006
21.1	21 : 06	0.966	0.001	2.376	0.003	2.888	0.004	3.284	0.004	3.700	0.005	4.714	0.006
21.2	21 : 12	0.967	0.001	2.379	0.003	2.892	0.004	3.289	0.004	3.705	0.005	4.720	0.006
21.3	21 : 18	0.968	0.001	2.382	0.003	2.896	0.004	3.293	0.004	3.709	0.005	4.726	0.006
21.4	21 : 24	0.970	0.001	2.385	0.003	2.899	0.004	3.297	0.004	3.714	0.005	4.732	0.006
21.5	21 : 30	0.971	0.001	2.389	0.003	2.903	0.004	3.301	0.004	3.719	0.005	4.738	0.006
21.6	21 : 36	0.972	0.001	2.392	0.003	2.907	0.004	3.305	0.004	3.723	0.005	4.744	0.006
21.7	21 : 42	0.973	0.001	2.395	0.003	2.910	0.004	3.309	0.004	3.728	0.005	4.750	0.006
21.8	21 : 48	0.975	0.001	2.397	0.003	2.914	0.004	3.314	0.004	3.733	0.005	4.756	0.006
21.9	21 : 54	0.976	0.001	2.400	0.003	2.918	0.004	3.318	0.004	3.737	0.005	4.762	0.006
22	22 : 00	0.977	0.001	2.403	0.003	2.921	0.004	3.322	0.004	3.742	0.005	4.768	0.006
22.1	22 : 06	0.978	0.001	2.406	0.003	2.925	0.004	3.326	0.004	3.747	0.005	4.774	0.006
22.2	22 : 12	0.979	0.001	2.409	0.003	2.928	0.004	3.330	0.004	3.751	0.005	4.779	0.006
22.3	22 : 18	0.981	0.001	2.412	0.003	2.932	0.004	3.334	0.004	3.756	0.005	4.785	0.006
22.4	22 : 24	0.982	0.001	2.415	0.003	2.935	0.004	3.338	0.004	3.760	0.005	4.791	0.006
22.5	22 : 30	0.983	0.001	2.418	0.003	2.939	0.004	3.342	0.004	3.765	0.005	4.797	0.006
22.6	22 : 36	0.984	0.001	2.421	0.003	2.942	0.003	3.346	0.004	3.769	0.004	4.802	0.006
22.7	22 : 42	0.985	0.001	2.424	0.003	2.946	0.003	3.350	0.004	3.774	0.004	4.808	0.006
22.8	22 : 48	0.986	0.001	2.427	0.003	2.949	0.003	3.354	0.004	3.778	0.004	4.814	0.006
22.9	22 : 54	0.988	0.001	2.429	0.003	2.953	0.003	3.358	0.004	3.783	0.004	4.819	0.006
23	23 : 00	0.989	0.001	2.432	0.003	2.956	0.003	3.362	0.004	3.787	0.004	4.825	0.006
23.1	23 : 06	0.990	0.001	2.435	0.003	2.960	0.003	3.366	0.004	3.791	0.004	4.831	0.006
23.2	23 : 12	0.991	0.001	2.438	0.003	2.963	0.003	3.370	0.004	3.796	0.004	4.836	0.006
23.3	23 : 18	0.992	0.001	2.441	0.003	2.967	0.003	3.373	0.004	3.800	0.004	4.842	0.006
23.4	23 : 24	0.993	0.001	2.444	0.003	2.970	0.003	3.377	0.004	3.804	0.004	4.847	0.006
23.5	23 : 30	0.994	0.001	2.446	0.003	2.973	0.003	3.381	0.004	3.809	0.004	4.853	0.006
23.6	23 : 36	0.996	0.001	2.449	0.003	2.977	0.003	3.385	0.004	3.813	0.004	4.858	0.005
23.7	23 : 42	0.997	0.001	2.452	0.003	2.980	0.003	3.389	0.004	3.817	0.004	4.864	0.005
23.8	23 : 48	0.998	0.001	2.455	0.003	2.983	0.003	3.392	0.004	3.822	0.004	4.869	0.005
23.9	23 : 54	0.999	0.001	2.457	0.003	2.987	0.003	3.396	0.004	3.826	0.004	4.875	0.005
24	24 : 00	1.000	0.001	2.460	0.003	2.990	0.003	3.400	0.004	3.830	0.004	4.880	0.005

Appendix B – Existing Condition Stormwater Calculations

HEC-RAS Input Data

Existing Basin Calculations

		CN	Abstraction Ratio	Min Infill Rate	Mannings N	% Impervious
0	NoData	92	0.05	0.05	0.05	0
1	NoData : C	90	0.05	0.05	0.05	0
10	Developed, Medium Intensity : NoData	86	0.05	0.05	0.3	80
11	Developed, Medium Intensity : C	81	0.05	0.05	0.3	80
12	Developed, Medium Intensity : B	72	0.05	0.05	0.3	80
13	Developed, Medium Intensity : A	57	0.05	0.05	0.3	80
14	Developed, Medium Intensity : D	86	0.05	0.05	0.3	80
15	Shrub-Scrub : NoData	77	0.05	0.05	0.06	0
16	Shrub-Scrub : C	70	0.05	0.05	0.06	0
17	Shrub-Scrub : B	56	0.05	0.05	0.06	0
18	Shrub-Scrub : A	35	0.05	0.05	0.06	0
19	Shrub-Scrub : D	77	0.05	0.05	0.06	0
2	NoData : B	85	0.05	0.05	0.05	0
20	Cultivated Crops : NoData	89	0.05	0.05	0.035	0
21	Cultivated Crops : C	85	0.05	0.05	0.035	0
22	Cultivated Crops : B	78	0.05	0.05	0.035	0
23	Cultivated Crops : A	67	0.05	0.05	0.035	0
24	Cultivated Crops : D	89	0.05	0.05	0.035	0
25	Woody Wetlands : NoData	86	0.05	0.05	0.04	0
26	Woody Wetlands : C	82	0.05	0.05	0.04	0
27	Woody Wetlands : B	73	0.05	0.05	0.04	0
28	Woody Wetlands : A	57	0.05	0.05	0.04	0
29	Woody Wetlands : D	86	0.05	0.05	0.04	0
3	NoData : A	76	0.05	0.05	0.05	0
30	Emergent Herbaceous Wetlands : NoData	93	0.05	0.05	0.04	0
31	Emergent Herbaceous Wetlands : C	87	0.05	0.05	0.04	0
32	Emergent Herbaceous Wetlands : B	80	0.05	0.05	0.04	0
33	Emergent Herbaceous Wetlands : A	70	0.05	0.05	0.04	0
34	Emergent Herbaceous Wetlands : D	93	0.05	0.05	0.04	0
35	Developed, Open Space : NoData	84	0.05	0.05	0.035	25
36	Developed, Open Space : C	79	0.05	0.05	0.035	25
37	Developed, Open Space : B	69	0.05	0.05	0.035	25
38	Developed, Open Space : A	49	0.05	0.05	0.035	25
39	Developed, Open Space : D	84	0.05	0.05	0.035	25
4	NoData : D	91	0.05	0.05	0.05	0
40	Developed, Low Intensity : NoData	84	0.05	0.05	0.035	25
41	Developed, Low Intensity : C	79	0.05	0.05	0.035	25
42	Developed, Low Intensity : B	68	0.05	0.05	0.035	25
43	Developed, Low Intensity : A	51	0.05	0.05	0.035	25
44	Developed, Low Intensity : D	84	0.05	0.05	0.035	25
45	Pasture, Hay : NoData	80	0.05	0.05	0.05	0
46	Pasture, Hay : C	74	0.05	0.05	0.05	0
47	Pasture, Hay : B	61	0.05	0.05	0.05	0
48	Pasture, Hay : A	39	0.05	0.05	0.05	0
49	Pasture, Hay : D	80	0.05	0.05	0.05	0
5	Developed, High Intensity : NoData	92	0.05	0.05	0.5	90
50	Grassland, Herbaceous : NoData	89	0.05	0.05	0.04	0
51	Grassland, Herbaceous : C	81	0.05	0.05	0.04	0
52	Grassland, Herbaceous : B	71	0.05	0.05	0.04	0
53	Grassland, Herbaceous : A	63	0.05	0.05	0.04	0
54	Grassland, Herbaceous : D	89	0.05	0.05	0.04	0
55	Barren Land : NoData	92	0.05	0.05	0.05	0
56	Barren Land : C	90	0.05	0.05	0.05	0
57	Barren Land : B	85	0.05	0.05	0.05	0
58	Barren Land : A	76	0.05	0.05	0.05	0
59	Barren Land : D	92	0.05	0.05	0.05	0
6	Developed, High Intensity : C	90	0.05	0.05	0.5	90
60	Open Water : NoData	100	0.05	0.05	0.015	100
61	Open Water : C	100	0.05	0.05	0.015	100
62	Open Water : B	100	0.05	0.05	0.015	100
63	Open Water : A	100	0.05	0.05	0.015	100
64	Open Water : D	100	0.05	0.05	0.015	100
7	Developed, High Intensity : B	85	0.05	0.05	0.5	90
8	Developed, High Intensity : A	77	0.05	0.05	0.5	90
9	Developed, High Intensity : D	92	0.05	0.05	0.5	90

Existing Basin Calculations			
Variable	Value	Units	Comments
Cw 2/10 Year	0.16	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
Cw 25 Year	0.18	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
Cw 100 Year	0.20	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
A1	150.31	Acres	Total Area for this land cover within the sub-basin
C1 - 2/10 Year	0.15	Agricultural	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 25 Year	0.17	Agricultural	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 100 Year	0.19	Agricultural	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
A2	5.84	Acres	Total Area for this land cover within the sub-basin
C1 - 2/10 Year	0.45	Developed, Low Intensity	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 25 Year	0.50	Developed, Low Intensity	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 100 Year	0.57	Developed, Low Intensity	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
A3	0.07	Acres	Total Area for this land cover within the sub-basin
C1 - 2/10 Year	0.38	Developed, Open Space	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 25 Year	0.41	Developed, Open Space	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 100 Year	0.47	Developed, Open Space	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
Tc	0.33	Hours	Time of Concentration found by using equation 3 in the Report
L	0.24	Miles	Length of longest flow path within the sub-basin
Kb	0.06	N/A	Watershed Resistance Coefficent found by using equation 4 in the report
m	-0.01375	N/A	Type B watershed Resistance Coefficients found in table 2-2
b	0.08	N/A	Type B watershed Resistance Coefficients found in table 2-2
S	26.4	ft/mi	Slope of the longest flow path within the sub-basin
i	5.96	N/A	Localized IDF value found in Table 2-7
Q 2/10 Year	150.19	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report
Q 25 Year	165.21	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report
Q 100 Year	190.06	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report

2.2 METHODS

The methods used to determine the design hydrology depends upon the characteristics of the watershed and the intended application. For small (less than 160 acres) urban watersheds with fairly uniform land usage, the Rational Method may be utilized to estimate peak runoff and required detention storage. This method is not suitable for larger more complex watersheds or if a hydrograph or channel routing is required.

For larger more complex watersheds, a precipitation-runoff and routing simulation model should be developed. Although not necessarily required, the U.S Army Corps of Engineers (USACE) HEC-1 Flood Hydrograph Program and the USACE HEC Hydrologic Modeling System (HEC-HMS) are acceptable simulation models for complex watersheds that are public domain. Guidance in the development of the simulation models and the estimation of necessary input parameters are provided in the HEC-1 and HEC-HMS User's Manuals.

2.2.1 Rational Method

2.2.1.1 Limitations

Application of the Rational Method is appropriate for watersheds less than 160 acres in size. This is based on the assumption that the rainfall intensity is to be uniformly distributed over the drainage area at a uniform rate lasting for the duration of the storm.

2.2.1.2 Peak Discharge Values

The Rational Equation relates rainfall intensity, a runoff coefficient and the watershed size to the generated peak discharge. The following shows this relationship:

$$Q = CiA \qquad (2.1)$$

Where:

Q = peak discharge (cfs)
c = runoff coefficient
i = rainfall intensity (in/hr) for the duration of T_c
A = drainage area (acres)
T_c = the time of concentration (hrs)

The Rational Equation is based on the concept that the application of a steady, uniform rainfall intensity will produce a peak discharge at such a time when all points of the watershed are contributing to the outflow at the point of design. Such a condition is met when the elapsed time is equal to the time of

concentration, T_c, which is defined to be the floodwave travel time from the most remote part of the watershed to the point of design. The time of concentration should be computed by applying the following equation developed by Papadakis and Kazan (1987):

- The drainage area should not exceed 160 acres
- The time of concentration (T_c) should not exceed 60 minutes
- The design does not involve channel routing

The Rational Method parameters are discussed in further detail in the following sections.

Runoff coefficient, C

As rain falls to the ground it gathers and starts to move overland to points of lower elevation. Some water soaks into the ground and some runs away from the point of fall. The nature of the ground surface affects the division between those two components; the harder and more compact the ground surface the less will percolate into the soil.

Hydrologists use the concept of a coefficient to numerically represent the degree to which water will soak in or run off. This coefficient can have values from 0 to 1, with higher numbers representing a higher portion of the water running off. Table 2-1 shows typical values.

The runoff coefficient accounts for the infiltration and interception characteristics of the drainage area. Generally, the runoff coefficient is based upon the typical soil or land use characteristics of the drainage area. For the runoff coefficient, the more impervious the land surface, the less porous the soil, the higher the amount of drainage runoff and the higher the runoff coefficient. The runoff coefficient is also adjusted and increased for larger storm events to account for increased runoff arising from soil saturation and wetted surfaces. Table 2-1 provides runoff coefficients for typical land uses and return periods.

Table 2-1: Runoff Coefficients [1,2]

Land Use Category	2-10 Year		25 Year		50 Year		100 Year	
	min	max	min	max	min	max	min	max
Very Low Density Residential[3]	0.33	0.42	0.36	0.46	0.40	0.50	0.41	0.53
Low Density Residential[3]	0.42	0.48	0.46	0.53	0.50	0.58	0.53	0.60
Medium Density Residential[3]	0.48	0.65	0.53	0.72	0.58	0.78	0.60	0.82
Multiple Family Residential[3]	0.65	0.75	0.72	0.83	0.78	0.90	0.82	0.94
Industrial 1[3]	0.60	0.70	0.66	0.77	0.72	0.84	0.75	0.88
Industrial 2[3]	0.70	0.80	0.77	0.88	0.84	0.95	0.88	0.95
Commercial 1[3]	0.55	0.65	0.61	0.72	0.66	0.78	0.69	0.81
Commercial 2[3]	0.75	0.85	0.83	0.94	0.90	0.95	0.94	0.95
Pavement and Rooftops	0.75	0.85	0.83	0.94	0.90	0.95	0.94	0.95
Gravel Roadways & Shoulders	0.60	0.70	0.66	0.77	0.72	0.84	0.75	0.88
Agricultural	0.10	0.20	0.11	0.22	0.12	0.24	0.13	0.25
Lawns/Parks/Cemeteries	0.10	0.25	0.11	0.28	0.12	0.30	0.13	0.31
Desert Landscaping 1	0.55	0.85	0.61	0.94	0.66	0.95	0.69	0.95
Desert Landscaping 2	0.30	0.40	0.33	0.44	0.36	0.48	0.38	0.50
Undeveloped Desert Rangeland	0.30	0.40	0.33	0.44	0.36	0.48	0.38	0.50
Hillslopes, Sonoran Desert	0.40	0.55	0.44	0.61	0.48	0.66	0.50	0.69
Mountain Terrain	0.60	0.80	0.66	0.88	0.72	0.95	0.75	0.95

[1] Runoff coefficients for 25-, 50-, and 100-Year storm frequencies were derived using adjustment factors of 1.10, 1.20 and 1.25, respectively, applied to the 2-10 Year values with an upper limit of 0.95

[2] The ranges of runoff coefficients shown for urban land uses were derived from lot coverage standards specified in the zoning ordinances for Maricopa Pinal County

[3] Runoff coefficients for urban land uses are for lot coverage only and do not include the adjacent street and right-of-way, or alleys.

Weighted runoff coefficients

Many times the ground surface in a tributary area cannot be properly represented using a single runoff coefficient. This is usually because of differences in ground cover. For example, between the right-of-way and the inlet some ground may have vegetative cover while other ground is paved.

A weighted runoff coefficient can be computed by proportion to the subareas using Equation (2-2):

$$C_w = \frac{A_1C_1 + A_2C_2 + \ldots + A_nC_n}{A_1 + A_2 + \ldots + A_n} \qquad (2\text{-}2)$$

Where:

A_i =Area in the i_{th} subarea, ac
C_i =Runoff coefficient for the i_{th} subarea

The weighted coefficient (C_w) is used in the Rational Formula just as would a single coefficient.

Rainfall Intensity, i, and Time of Concentration, T_c

The Rational Equation is based on the concept that steady uniform rainfall intensity will produce a peak discharge at such a time when the entire drainage area is contributing to the outflow. This condition is met when the rainfall duration is equal to the time of concentration, T_c, which is defined as the time it takes for water to travel from the most remote part of the drainage area to the point of design. The time of concentration is computed by applying the following equation:

$$T_c = 11.4 L^{0.5} K_b^{0.52} S^{-0.31} i^{-0.38} \quad (2\text{-}2)$$

Where:

T_c = the time of concentration (hrs)
L = length of the longest flow path (miles)
K_b = watershed resistance coefficient
S = watercourse slope (ft/mi)
i = rainfall intensity (in/hr)

K_b is an approximation of the watershed "roughness" and accounts for its impact on the time it takes flow to travel across a particular type of land surface. The empirical equation for estimating K_b is:

$$K_b = m \log A + b \quad (2\text{-}3)$$

Where:

K_b = watershed resistance coefficient
A = drainage area (acres)
m and b = empirical equation parameters (unitless)

Table 2-2 provides the equation parameters to determine K_b values for typical land use types.

Since the equation for the time of concentration has two unknowns, T_c and i, the following iterative process using Intensity-Duration-Frequency (I-D-F) curves is required to converge upon the values of T_c and i. I-D-F curves are presented in a later section of this chapter.

1) Determine all the initial parameters (L, K_b, and S) and select the design storm return frequency (2-yr, 5-yr, 10-yr, etc.)

2) Make an initial trial estimate for T_c and obtain the rainfall intensity, i, from the I-D-F curve for the return frequency using T_c as the storm duration.

a. If the T_c value from Method 1 is the longest, compute the total peak discharge using the Method 1 intensity, the arithmetically area-weighted value of C for all three subareas and the total contributing drainage area at Concentration Point 2.

b. If the T_c value from Method 2 is the longest, determine i directly from the D-D-F statistics. Compute the total peak discharge at Concentration Point 2 using the arithmetically area-weighted value of C for all three subareas and the total contributing drainage area at Concentration Point 2.

c. If the T_c from subarea C is the longest, compute the total peak discharge using the i for subarea C, the arithmetically area-weighted value of C for all three subareas and the total contributing drainage area at Concentration Point 2.

8. As an alternative to the above procedure, the DDMSW program may be used to calculate the peak discharge at intermediate locations.

2.2.1.4 Detention/Retention Storage Volume Calculations

For purposes of determining on-site detention requirements utilizing the Rational Method, the following equation can be used:

$$V = C(\frac{P}{12})A \qquad (2\text{-}4)$$

Where:

V = Storage Volume (acre-ft)
C = Watershed Runoff Coefficient
P = 100-Year, 2-Hour Precipitation (inches)
A = Drainage Area (acres)

In the case of volume calculations for stormwater storage facility design, P equals the 100-year, 2-hour depth, in inches.

2.2.1.5 Flood Hydrographs

The procedure described within this section should be used in conjunction with the Rational Method for developing hydrographs from small watersheds, for the design of stormwater detention/retention basins, and for other stormwater routing analyses. As with the Rational Method, this hydrograph synthesis should not be used for watershed areas greater that 160 acres. This procedure was taken from Hickok, et. al, 1959, which presented a method of hydrograph synthesis for small watersheds within the Southwest.

Table 2-7: Rainfall data for Coolidge

PREFRE Program Input Data

2-yr, 6-hr =	1.20
2-yr, 24-hr =	1.40
100-yr, 6-hr =	3.20
100-yr, 24-hr =	3.80

Depth-Duration-Frequency (D-D-F)

	Frequency						
Duration	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	500-Yr
5 min	0.33	0.43	0.50	0.60	0.68	0.76	0.94
10 min	0.49	0.65	0.77	0.92	1.04	1.16	1.44
15 min	0.59	0.82	0.97	1.17	1.33	1.49	1.86
30 min	0.79	1.09	1.30	1.58	1.80	2.02	2.53
1-hr	1.00	1.35	1.61	1.97	2.25	2.53	3.17
2-hr	1.04	1.47	1.76	2.15	2.45	2.76	3.46
3-hr	1.10	1.55	1.85	2.27	2.59	2.91	3.65
6-hr	1.20	1.70	2.03	2.49	2.85	3.20	4.01
12-hr	1.30	1.85	2.22	2.72	3.11	3.50	4.40
24-hr	1.40	2.00	2.40	2.95	3.38	3.80	4.78

*D-D-F data obtained from PREFRE Program

Localized Intensity-Depth-Frequency (I-D-F)

Duration	Frequency						
(minutes)	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	500-Yr
5	3.96	5.16	6.00	7.20	8.16	9.12	11.28
10	2.94	3.90	4.62	5.52	6.24	6.96	8.64
15	2.36	3.28	3.88	4.68	5.32	5.96	7.44
30	1.58	2.18	2.60	3.16	3.60	4.04	5.06
60	1.00	1.35	1.61	1.97	2.25	2.53	3.17

Appendix C – Proposed Condition Stormwater Calculations

HEC-RAS Input Data

Proposed Basin Calculations

Proposed Detention Pond Calculations

		CN	CN Adjusted	Abstraction Ratio	Min Infill Rate	Mannings N	% Impervious
0	NoData	92			0.05	0.05	0
1	NoData : C	90			0.05	0.05	0
10	Developed, Medium Intensity : NoData	86			0.05	0.3	80
11	Developed, Medium Intensity : C	81			0.05	0.3	80
12	Developed, Medium Intensity : B	72			0.05	0.3	80
13	Developed, Medium Intensity : A	57			0.05	0.3	80
14	Developed, Medium Intensity : D	86			0.05	0.3	80
15	Shrub-Scrub : NoData	77			0.05	0.06	0
16	Shrub-Scrub : C	70			0.05	0.06	0
17	Shrub-Scrub : B	56			0.05	0.06	0
18	Shrub-Scrub : A	35			0.05	0.06	0
19	Shrub-Scrub : D	77			0.05	0.06	0
2	NoData : B	85			0.05	0.05	0
20	Cultivated Crops : NoData	89			0.05	0.035	0
21	Cultivated Crops : C	85			0.05	0.035	0
22	Cultivated Crops : B	78			0.05	0.035	0
23	Cultivated Crops : A	67			0.05	0.035	0
24	Cultivated Crops : D	89			0.05	0.035	0
25	Woody Wetlands : NoData	86			0.05	0.04	0
26	Woody Wetlands : C	82			0.05	0.04	0
27	Woody Wetlands : B	73			0.05	0.04	0
28	Woody Wetlands : A	57			0.05	0.04	0
29	Woody Wetlands : D	86			0.05	0.04	0
3	NoData : A	76			0.05	0.05	0
30	Emergent Herbaceous Wetlands : NoData	93			0.05	0.04	0
31	Emergent Herbaceous Wetlands : C	87			0.05	0.04	0
32	Emergent Herbaceous Wetlands : B	80			0.05	0.04	0
33	Emergent Herbaceous Wetlands : A	70			0.05	0.04	0
34	Emergent Herbaceous Wetlands : D	93			0.05	0.04	0
35	Developed, Open Space : NoData	84			0.05	0.035	25
36	Developed, Open Space : C	79			0.05	0.035	25
37	Developed, Open Space : B	69			0.05	0.035	25
38	Developed, Open Space : A	49			0.05	0.035	25
39	Developed, Open Space : D	84			0.05	0.035	25
4	NoData : D	91			0.05	0.05	0
40	Developed, Low Intensity : NoData	84			0.05	0.035	25
41	Developed, Low Intensity : C	79			0.05	0.035	25
42	Developed, Low Intensity : B	68			0.05	0.035	25
43	Developed, Low Intensity : A	51			0.05	0.035	25
44	Developed, Low Intensity : D	84			0.05	0.035	25
45	Pasture, Hay : NoData	80			0.05	0.05	0
46	Pasture, Hay : C	74			0.05	0.05	0
47	Pasture, Hay : B	61			0.05	0.05	0
48	Pasture, Hay : A	39			0.05	0.05	0
49	Pasture, Hay : D	80			0.05	0.05	0
5	Developed, High Intensity : NoData	92			0.05	0.5	90
50	Grassland, Herbaceous : NoData	89			0.05	0.04	0
51	Grassland, Herbaceous : C	81			0.05	0.04	0
52	Grassland, Herbaceous : B	71			0.05	0.04	0
53	Grassland, Herbaceous : A	63			0.05	0.04	0
54	Grassland, Herbaceous : D	89			0.05	0.04	0
55	Barren Land : NoData	92			0.05	0.05	0
56	Barren Land : C	90			0.05	0.05	0
57	Barren Land : B	85			0.05	0.05	0
58	Barren Land : A	76			0.05	0.05	0
59	Barren Land : D	92			0.05	0.05	0
6	Developed, High Intensity : C	90			0.05	0.5	90
60	Open Water : NoData	100			0.05	0.015	100
61	Open Water : C	100			0.05	0.015	100
62	Open Water : B	100			0.05	0.015	100
63	Open Water : A	100			0.05	0.015	100
64	Open Water : D	100			0.05	0.015	100
7	Developed, High Intensity : B	85			0.05	0.5	90
8	Developed, High Intensity : A	77			0.05	0.5	90
9	Developed, High Intensity : D	92			0.05	0.5	90
	Proposed Roads : NoData	94			0.05	0.02	90
	Proposed Roads : A	91			0.05	0.02	90
	Proposed Roads : B	92			0.05	0.02	90
	Proposed Roads : C	93			0.05	0.02	90
	Proposed Roads : D	94			0.05	0.02	90

Proposed Basin Calculations			
Variable	Value	Units	Comments
Cw 2/10 Year	0.24	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
Cw 25 Year	0.27	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
Cw 100 Year	0.31	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
A1	25.58	Acres	Total Area for this land cover within the basin
C1 - 2/10 Year	0.65	Gravel Roads & Shoulders	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
C1 - 25 Year	0.72	Gravel Roads & Shoulders	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
C1 - 100 Year	0.82	Gravel Roads & Shoulders	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
A2	124.70	Acres	Total Area for this land cover within the basin
C2 - 2/10 Year	0.15	Agricultural	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
C2 - 25 Year	0.17	Agricultural	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
C2 - 100 Year	0.19	Agricultural	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
A3	5.84	Acres	Total Area for this land cover within the basin
C2 - 2/10 Year	0.45	Developed, Low Intensity	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
C2 - 25 Year	0.50	Developed, Low Intensity	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
C2 - 100 Year	0.57	Developed, Low Intensity	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
A4	0.07	Acres	Total Area for this land cover within the basin
C2 - 2/10 Year	0.38	Developed, Open Space	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
C2 - 25 Year	0.41	Developed, Open Space	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
C2 - 100 Year	0.47	Developed, Open Space	Average for the runoff Coefficients of the storm event of the land cover found in Table 2-1
Tc	0.22	Hours	Time of Concentration found by using equation 3 in the Report
L	0.34	Miles	Length of longest flow path within the sub-basin
Kb	0.03	N/A	Watershed Resistance Coefficent found by using equation 4 in the report
m	-0.00625	N/A	Type A watershed Resistance Coefficients found in table 2-2
b	0.04	N/A	Type A watershed Resistance Coefficients found in table 2-2
S	26.4	ft/mi	Slope of the longest flow path within the sub-basin
i	6.96	N/A	Localized IDF value found in Table 2-7
Q 2/10 Year	264.36	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report
Q 25 Year	290.80	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report
Q 100 Year	333.17	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report

Proposed Pond Calculations			
Variable	Value	Units	Comments
V	1.50	Acre-feet	Required Storage Volume found by using equation 5 in the report
Cw 100 Year	0.31	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
100-yr-2-hr Prep.	2.41	Inches	Value obtained by NOAA Rainfall data
A	156.18	Acres	Total Area for this land cover within the sub-basin

2.2 METHODS

The methods used to determine the design hydrology depends upon the characteristics of the watershed and the intended application. For small (less than 160 acres) urban watersheds with fairly uniform land usage, the Rational Method may be utilized to estimate peak runoff and required detention storage. This method is not suitable for larger more complex watersheds or if a hydrograph or channel routing is required.

For larger more complex watersheds, a precipitation-runoff and routing simulation model should be developed. Although not necessarily required, the U.S Army Corps of Engineers (USACE) HEC-1 Flood Hydrograph Program and the USACE HEC Hydrologic Modeling System (HEC-HMS) are acceptable simulation models for complex watersheds that are public domain. Guidance in the development of the simulation models and the estimation of necessary input parameters are provided in the HEC-1 and HEC-HMS User's Manuals.

2.2.1 Rational Method

2.2.1.1 Limitations

Application of the Rational Method is appropriate for watersheds less than 160 acres in size. This is based on the assumption that the rainfall intensity is to be uniformly distributed over the drainage area at a uniform rate lasting for the duration of the storm.

2.2.1.2 Peak Discharge Values

The Rational Equation relates rainfall intensity, a runoff coefficient and the watershed size to the generated peak discharge. The following shows this relationship:

$$Q = CiA \qquad (2.1)$$

Where:

Q = peak discharge (cfs)
c = runoff coefficient
i = rainfall intensity (in/hr) for the duration of T_c
A = drainage area (acres)
T_c = the time of concentration (hrs)

The Rational Equation is based on the concept that the application of a steady, uniform rainfall intensity will produce a peak discharge at such a time when all points of the watershed are contributing to the outflow at the point of design. Such a condition is met when the elapsed time is equal to the time of

concentration, T_c, which is defined to be the floodwave travel time from the most remote part of the watershed to the point of design. The time of concentration should be computed by applying the following equation developed by Papadakis and Kazan (1987):

- The drainage area should not exceed 160 acres
- The time of concentration (T_c) should not exceed 60 minutes
- The design does not involve channel routing

The Rational Method parameters are discussed in further detail in the following sections.

Runoff coefficient, C

As rain falls to the ground it gathers and starts to move overland to points of lower elevation. Some water soaks into the ground and some runs away from the point of fall. The nature of the ground surface affects the division between those two components; the harder and more compact the ground surface the less will percolate into the soil.

Hydrologists use the concept of a coefficient to numerically represent the degree to which water will soak in or run off. This coefficient can have values from 0 to 1, with higher numbers representing a higher portion of the water running off. Table 2-1 shows typical values.

The runoff coefficient accounts for the infiltration and interception characteristics of the drainage area. Generally, the runoff coefficient is based upon the typical soil or land use characteristics of the drainage area. For the runoff coefficient, the more impervious the land surface, the less porous the soil, the higher the amount of drainage runoff and the higher the runoff coefficient. The runoff coefficient is also adjusted and increased for larger storm events to account for increased runoff arising from soil saturation and wetted surfaces. Table 2-1 provides runoff coefficients for typical land uses and return periods.

Table 2-1: Runoff Coefficients [1,2]

Land Use Category	2-10 Year		25 Year		50 Year		100 Year	
	min	max	min	max	min	max	min	max
Very Low Density Residential[3]	0.33	0.42	0.36	0.46	0.40	0.50	0.41	0.53
Low Density Residential[3]	0.42	0.48	0.46	0.53	0.50	0.58	0.53	0.60
Medium Density Residential[3]	0.48	0.65	0.53	0.72	0.58	0.78	0.60	0.82
Multiple Family Residential[3]	0.65	0.75	0.72	0.83	0.78	0.90	0.82	0.94
Industrial 1[3]	0.60	0.70	0.66	0.77	0.72	0.84	0.75	0.88
Industrial 2[3]	0.70	0.80	0.77	0.88	0.84	0.95	0.88	0.95
Commercial 1[3]	0.55	0.65	0.61	0.72	0.66	0.78	0.69	0.81
Commercial 2[3]	0.75	0.85	0.83	0.94	0.90	0.95	0.94	0.95
Pavement and Rooftops	0.75	0.85	0.83	0.94	0.90	0.95	0.94	0.95
Gravel Roadways & Shoulders	0.60	0.70	0.66	0.77	0.72	0.84	0.75	0.88
Agricultural	0.10	0.20	0.11	0.22	0.12	0.24	0.13	0.25
Lawns/Parks/Cemeteries	0.10	0.25	0.11	0.28	0.12	0.30	0.13	0.31
Desert Landscaping 1	0.55	0.85	0.61	0.94	0.66	0.95	0.69	0.95
Desert Landscaping 2	0.30	0.40	0.33	0.44	0.36	0.48	0.38	0.50
Undeveloped Desert Rangeland	0.30	0.40	0.33	0.44	0.36	0.48	0.38	0.50
Hillslopes, Sonoran Desert	0.40	0.55	0.44	0.61	0.48	0.66	0.50	0.69
Mountain Terrain	0.60	0.80	0.66	0.88	0.72	0.95	0.75	0.95

[1] Runoff coefficients for 25-, 50-, and 100-Year storm frequencies were derived using adjustment factors of 1.10, 1.20 and 1.25, respectively, applied to the 2-10 Year values with an upper limit of 0.95

[2] The ranges of runoff coefficients shown for urban land uses were derived from lot coverage standards specified in the zoning ordinances for Maricopa Pinal County

[3] Runoff coefficients for urban land uses are for lot coverage only and do not include the adjacent street and right-of-way, or alleys.

Weighted runoff coefficients

Many times the ground surface in a tributary area cannot be properly represented using a single runoff coefficient. This is usually because of differences in ground cover. For example, between the right-of-way and the inlet some ground may have vegetative cover while other ground is paved.

A weighted runoff coefficient can be computed by proportion to the subareas using Equation (2-2):

$$C_w = \frac{A_1C_1 + A_2C_2 + \ldots + A_nC_n}{A_1 + A_2 + \ldots + A_n} \qquad (2\text{-}2)$$

Where:

A_i =Area in the i_{th} subarea, ac
C_i =Runoff coefficient for the i_{th} subarea

The weighted coefficient (C_w) is used in the Rational Formula just as would a single coefficient.

Rainfall Intensity, i, and Time of Concentration, T_c

The Rational Equation is based on the concept that steady uniform rainfall intensity will produce a peak discharge at such a time when the entire drainage area is contributing to the outflow. This condition is met when the rainfall duration is equal to the time of concentration, T_c, which is defined as the time it takes for water to travel from the most remote part of the drainage area to the point of design. The time of concentration is computed by applying the following equation:

$$T_c = 11.4 L^{0.5} K_b^{0.52} S^{-0.31} i^{-0.38} \quad (2\text{-}2)$$

Where:

T_c = the time of concentration (hrs)
L = length of the longest flow path (miles)
K_b = watershed resistance coefficient
S = watercourse slope (ft/mi)
i = rainfall intensity (in/hr)

K_b is an approximation of the watershed "roughness" and accounts for its impact on the time it takes flow to travel across a particular type of land surface. The empirical equation for estimating K_b is:

$$K_b = m \log A + b \quad (2\text{-}3)$$

Where:

K_b = watershed resistance coefficient
A = drainage area (acres)
m and b = empirical equation parameters (unitless)

Table 2-2 provides the equation parameters to determine K_b values for typical land use types.

Since the equation for the time of concentration has two unknowns, T_c and i, the following iterative process using Intensity-Duration-Frequency (I-D-F) curves is required to converge upon the values of T_c and i. I-D-F curves are presented in a later section of this chapter.

1) Determine all the initial parameters (L, K_b, and S) and select the design storm return frequency (2-yr, 5-yr, 10-yr, etc.)

2) Make an initial trial estimate for T_c and obtain the rainfall intensity, i, from the I-D-F curve for the return frequency using T_c as the storm duration.

a. If the T_c value from Method 1 is the longest, compute the total peak discharge using the Method 1 intensity, the arithmetically area-weighted value of C for all three subareas and the total contributing drainage area at Concentration Point 2.

b. If the T_c value from Method 2 is the longest, determine i directly from the D-D-F statistics. Compute the total peak discharge at Concentration Point 2 using the arithmetically area-weighted value of C for all three subareas and the total contributing drainage area at Concentration Point 2.

c. If the T_c from subarea C is the longest, compute the total peak discharge using the i for subarea C, the arithmetically area-weighted value of C for all three subareas and the total contributing drainage area at Concentration Point 2.

8. As an alternative to the above procedure, the DDMSW program may be used to calculate the peak discharge at intermediate locations.

2.2.1.4 Detention/Retention Storage Volume Calculations

For purposes of determining on-site detention requirements utilizing the Rational Method, the following equation can be used:

$$V = C(\frac{P}{12})A \qquad (2\text{-}4)$$

Where:

V = Storage Volume (acre-ft)
C = Watershed Runoff Coefficient
P = 100-Year, 2-Hour Precipitation (inches)
A = Drainage Area (acres)

In the case of volume calculations for stormwater storage facility design, P equals the 100-year, 2-hour depth, in inches.

2.2.1.5 Flood Hydrographs

The procedure described within this section should be used in conjunction with the Rational Method for developing hydrographs from small watersheds, for the design of stormwater detention/retention basins, and for other stormwater routing analyses. As with the Rational Method, this hydrograph synthesis should not be used for watershed areas greater that 160 acres. This procedure was taken from Hickok, et. al, 1959, which presented a method of hydrograph synthesis for small watersheds within the Southwest.

Table 2-7: Rainfall data for Coolidge

PREFRE Program Input Data

2-yr, 6-hr =	1.20
2-yr, 24-hr =	1.40
100-yr, 6-hr =	3.20
100-yr, 24-hr =	3.80

Depth-Duration-Frequency (D-D-F)

	Frequency						
Duration	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	500-Yr
5 min	0.33	0.43	0.50	0.60	0.68	0.76	0.94
10 min	0.49	0.65	0.77	0.92	1.04	1.16	1.44
15 min	0.59	0.82	0.97	1.17	1.33	1.49	1.86
30 min	0.79	1.09	1.30	1.58	1.80	2.02	2.53
1-hr	1.00	1.35	1.61	1.97	2.25	2.53	3.17
2-hr	1.04	1.47	1.76	2.15	2.45	2.76	3.46
3-hr	1.10	1.55	1.85	2.27	2.59	2.91	3.65
6-hr	1.20	1.70	2.03	2.49	2.85	3.20	4.01
12-hr	1.30	1.85	2.22	2.72	3.11	3.50	4.40
24-hr	1.40	2.00	2.40	2.95	3.38	3.80	4.78

*D-D-F data obtained from PREFRE Program

Localized Intensity-Depth-Frequency (I-D-F)

Duration	Frequency						
(minutes)	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	500-Yr
5	3.96	5.16	6.00	7.20	8.16	9.12	11.28
10	2.94	3.90	4.62	5.52	6.24	6.96	8.64
15	2.36	3.28	3.88	4.68	5.32	5.96	7.44
30	1.58	2.18	2.60	3.16	3.60	4.04	5.06
60	1.00	1.35	1.61	1.97	2.25	2.53	3.17

Appendix D – Existing Condition Exhibit Maps

Subbasin Map

Soils Map

Land Cover Map

Curve Number Map



200 0 200 400

(IN FEET)
1 inch = 200 ft.

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VALLEY FARMS BESS
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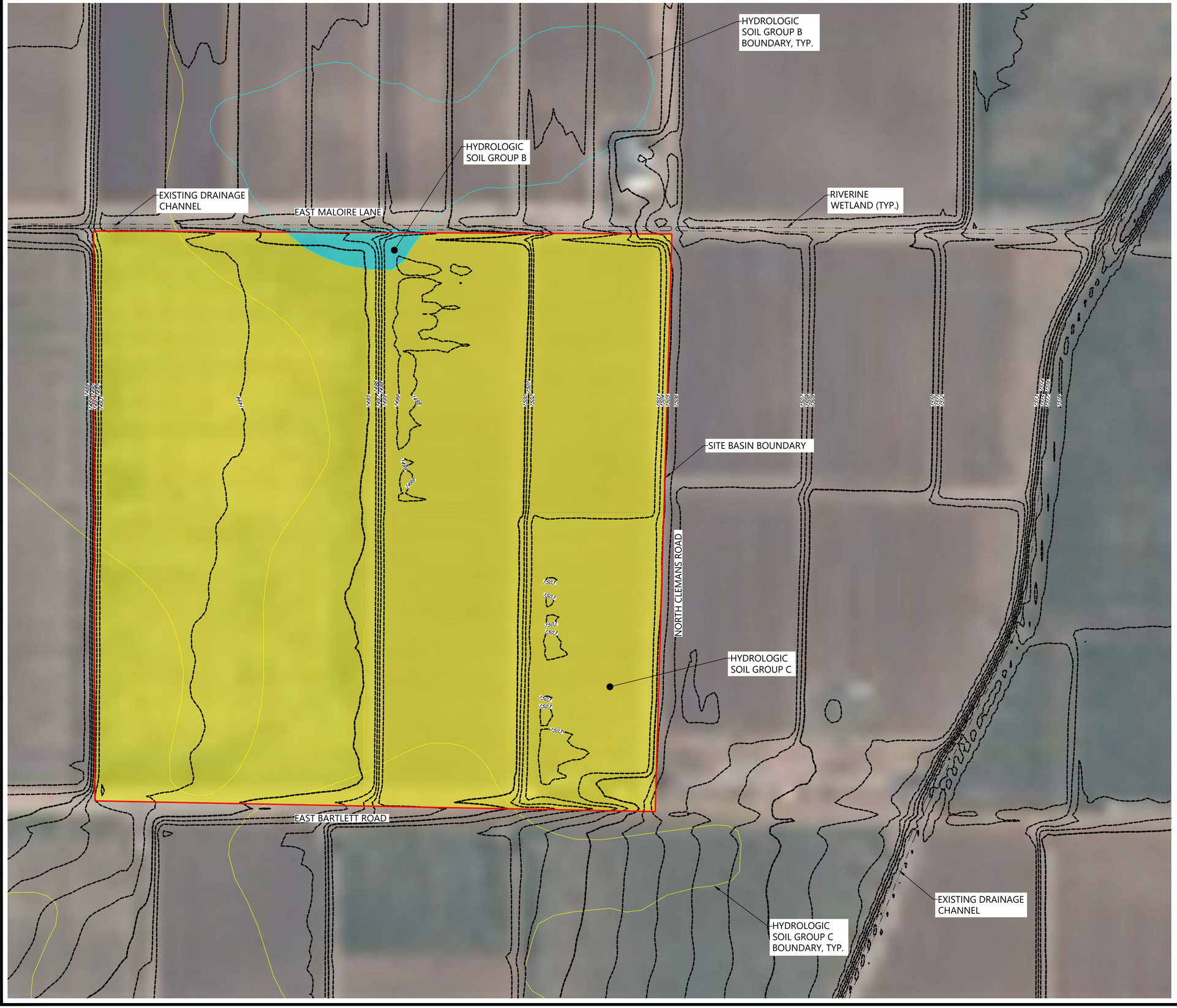
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LEGEND:

- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C

200 0 200 400

(IN FEET)
1 inch = 200 ft.

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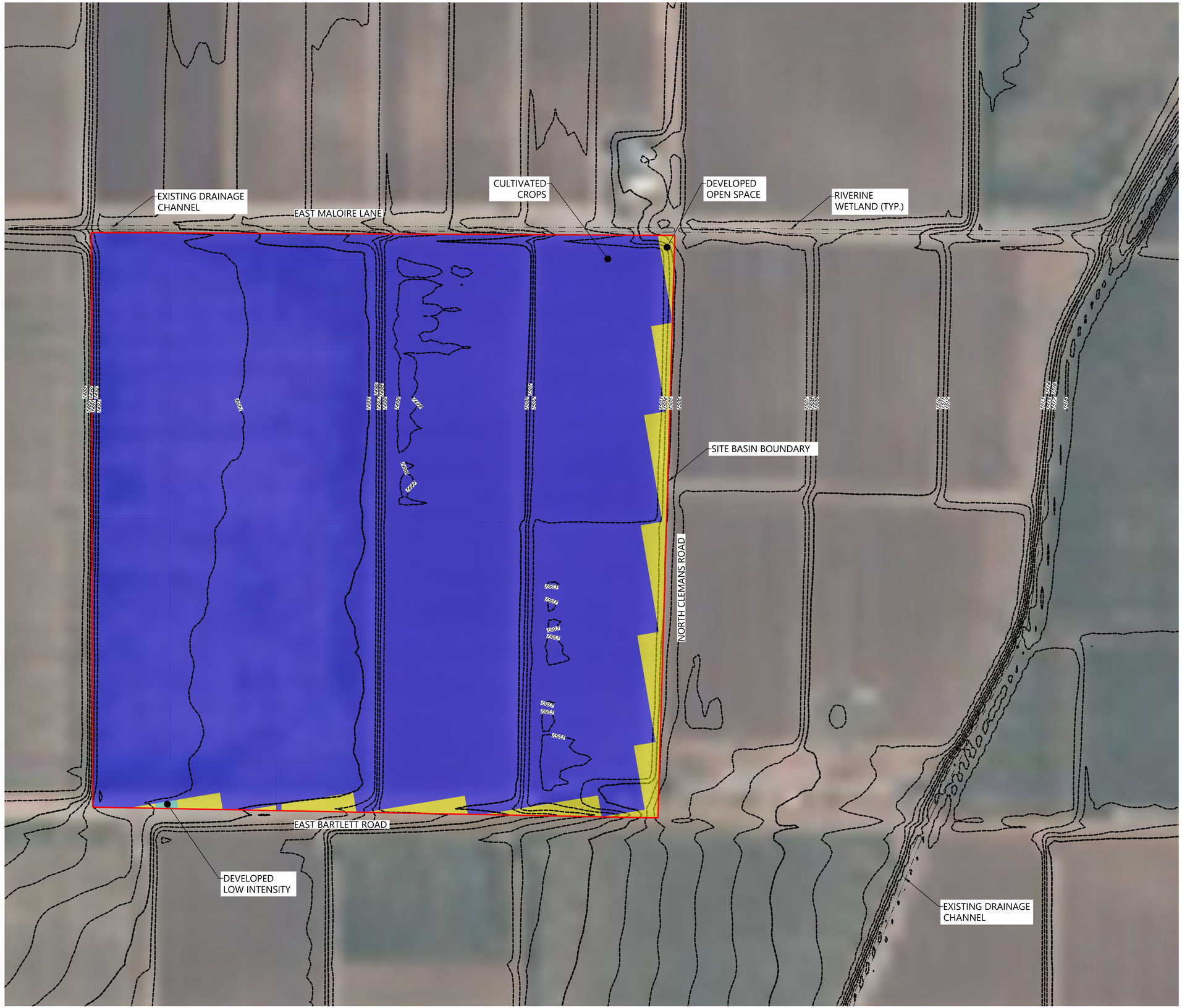
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LEGEND:

- BASIN - CULTIVATED CROPS
- BASIN - DEVELOPED OPEN SPACE
- BASIN - DEVELOPED LOW INTENSITY

200 0 200 400

(IN FEET)
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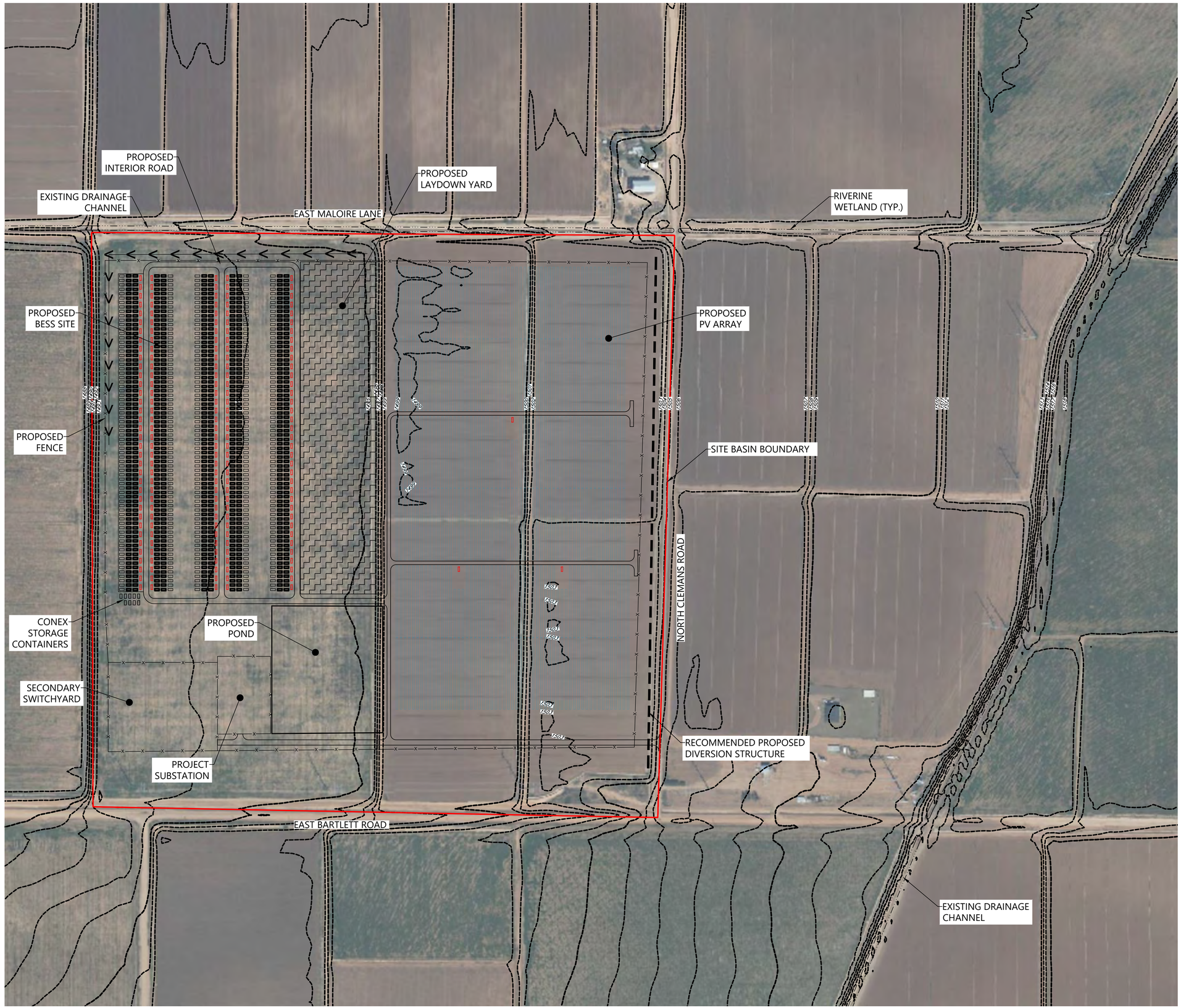
Appendix E – Proposed Condition Exhibit Maps

Subbasin Map

Soils Map

Land Cover Map

Curve Number Map



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VALLEY FARMS BESS
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PROPOSED BASIN MAP

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DATE 09/30/2024

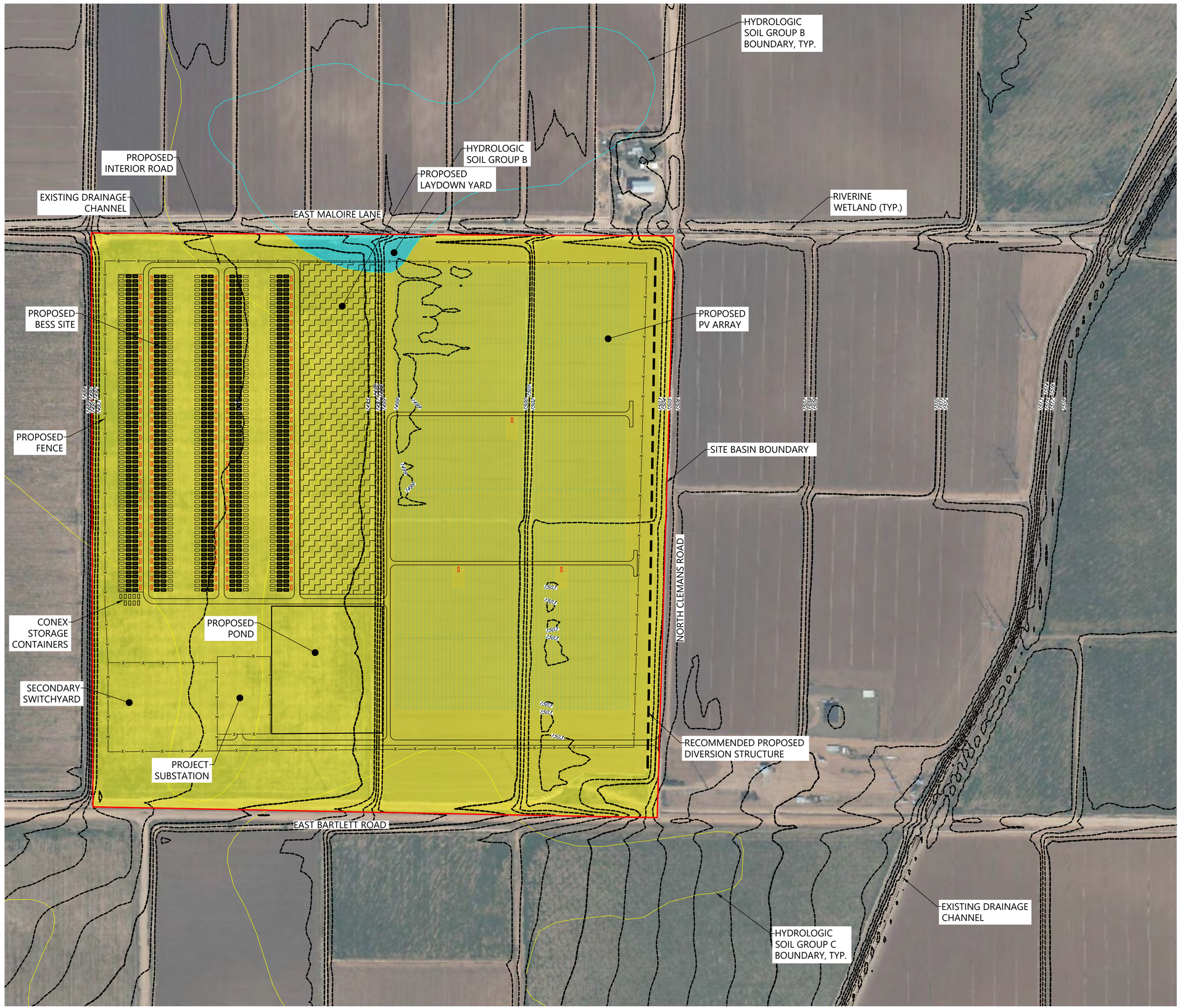
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LEGEND:

- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C

200 0 200 400

(IN FEET)
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VALLEY FARMS BESS
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LEGEND:

- BASIN - CULTIVATED CROPS
- BASIN - DEVELOPED OPEN SPACE
- BASIN - DEVELOPED LOW INTENSITY
- BASIN - PROPOSED SITE

200 0 200 400

(IN FEET)
1 inch = 200 ft.

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HYDROLOGY STUDY

VALLEY FARMS ENERGY CENTER
PINAL COUNTY, ARIZONA

Prepared for

NextEra Energy
700 Universe Blvd
Juno Beach, FL 33408

Atwell Project No. 24000083



Expires 3/31/2027

Submitted by Atwell, LLC

REVISION NO:	DATE:	REVISION:	PROJECT MANAGER APPROVAL (INITIAL & DATE)	CLIENT APPROVAL (INITIAL & DATE)
	09/06/2024	Final Report		

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1 Project Description

Valley Farms Energy Center, LLC (Applicant), a wholly owned indirect subsidiary of NextEra Energy Resources, is requesting a Zone Change and Planned Area Development (PAD) Overlay District to construct, operate, and maintain the Valley Farms Energy Center Project, a utility-scale photovoltaic (PV) solar facility and battery energy storage system (BESS) on approximately 160 acres of private land in unincorporated Pinal County, Arizona.

The proposed construction consists of a PV solar facility and a battery energy storage system and will include a substation and associated electrical equipment mounted on mat foundations.

Proposed earthwork will consist of typical clearing and grubbing of vegetation and grading with associated cuts and fills necessary for equipment installation. Dirt or gravel access and maintenance roads will be constructed to access the site and substation. Natural drainage patterns will be maintained through and around the site.

2 Location

The project is located in central Pinal County in southern Arizona, approximately 4.30 miles southeast of Coolidge, Arizona. The west edge of the project is approximately 2600' east of North Attaway Road. The north edge of the project is bounded by East Malorie Lane. The east edge of the project is bounded by North Clemans Road. The south edge of the project is bounded by East Bartlett Road. The site is part of the Middle Gila watershed.



Figure 1: Project Location

3. Soils

The site and surrounding areas are relatively flat with typical slopes ranging between 0-5%. The soil types are a mix of silty loams, sandy loams and clay loams. The surface runoff rate for the site is low. The runoff rate shows the amount of stormwater that is not infiltrated. The low rate shows that a large percentage of the stormwater for the site infiltrates into the soil before leaving the site and entering the waterways. The full Soils Report from the USDA is included in Appendix A.

4. Land Cover

4.1 Existing Conditions

The site is dominated by mostly flat, agricultural land that has historically been used for farming. The site is located within flood zone X, areas of minimal flood hazard, according to FIRM panel 04021C1250E dated 12/04/2007. This FIRM panel is located within Appendix A. The National Wetland inventory shows an existing drainage channel north of the site classified as Riverine habitat. Existing Conditions Exhibit Maps are shown in Appendix D.

4.2 Proposed Conditions

The Valley Farms Energy Center Project will be a battery energy storage and solar PV facility and will include associated electrical facilities mounted on mat foundations including high voltage equipment. The ground surface around the BESS equipment will likely be gravel, with surface runoff flowing off the equipment pads. Analysis within this report has assumed that proposed ground cover within the access roads, substation pad, and BESS equipment areas will be gravel, and the remainder of the site including the PV array areas will be seeded with low-maintenance tall grass that will maintain the hydrologic characteristics of the existing conditions. Natural drainage patterns will be maintained through and around the site, to the greatest extent practical, to minimize environmental impacts to the surrounding areas. A stormwater detention pond will be needed, with appropriate drainage swales to convey runoff into the pond. For the purposes of this report, it is assumed that offsite flows are to be diverted around the project site. Proposed Conditions Exhibit Maps are shown in Appendix E.

5. Weather and Climate

Pinal County, Arizona is situated at an average elevation of 2,340’ above sea level with temperatures ranging from an average daytime high in July of 105 degrees Fahrenheit to an average daily low in January of 38 degrees Fahrenheit. The county receives approximately 11 inches of rainfall in a typical year. August is the wettest month with 1.8 inches of rain, and the driest month is June with 0.1 inches of rain. Pinal County, Arizona averages 0.5 inches of snowfall in a typical year. On average, there are 292 days of sunshine per year.

6. Major Watersheds

The site is part of the Lower Colorado Resource Region (HCU 15), a region with an approximate size of 140,000 square miles. The region includes parts of Arizona, California, Nevada, New Mexico and Utah

The site is part of the Middle Gila watershed (15050100), within the Lower Colorado Water Resource Region. Runoff from the site currently flows westward into an existing drainage channel. This drainage channel then conveys runoff northwestward for approximately 5 miles until it reaches the Gila River. The watershed follows the Gila River west up until the Yuma, Arizona area where the confluence of the Gila River with the Colorado River occurs. The Colorado river then travels south until it reaches the Gulf of California.

7. Design Requirements

The Pinal County, Arizona Drainage Manual Volume I and II provide acceptable methods for hydrology calculations. Computer modeling with HEC software is provided as an acceptable method. This study uses a Hydrograph Computer Program (HEC-RAS). This software uses a hydrograph method for calculation, which is an acceptable conceptual method. The TR -55 method was used for determining time of concentration. Values used for this calculation are reviewed in the sections below. Modeling was completed to determine depth, velocity, and scour.

8. Design Methodology

The proposed site will attempt to preserve the existing runoff patterns to the extent possible. Waterways will not be impacted by the proposed development and careful ground preparation will preserve or even enhance the hydrologic properties of the existing soils.

9. Modified Soil Cover Complex Method

Also known as TR-55, this method is recommended to determine the peak discharge and a hydrograph from individual drainage areas up to 1 square mile. Only a peak discharge may be determined using the Graphical Peak Discharge method, thus is not used or described in this study. A peak discharge and a hydrograph may be determined using the Tabular Hydrograph method and is the method that was used in this study with the assistance of modern HEC-RAS software (described in more detail further in this report). Input requirements for both the Graphical Peak Discharge method and the Tabular Hydrograph method include:

1. Q – runoff (in). Variables used to calculate Q include P – rainfall (in), Ia – initial abstraction (in), and S – potential maximum retention after runoff begins (in). Values of P should be calculated for the project site based on the 24 hour rainfall events.
2. Tc – time of concentration (hours – minimum is 6 minutes or 0.1 hours).
3. Am – drainage area (sq. miles)
4. Appropriate rainfall distribution (Type I, IA, II, and III). This information is necessary to compute the unit peak discharge, Qu, for the Graphical method, and the tabular hydrograph unit discharge, Qt, for the Tabular method. Pinal County, Arizona has a Type II distribution.

10. HEC-RAS Modeling

HEC-RAS v6.4.1 was used as the primary hydraulic modelling tool in this study. The current version allows the creation of two-dimensional hydraulic models. These models can utilize a user-defined input array (mimicking TR-55 input data) along with available topographic information to create a hydraulic model that can be used to calculate peak flows, water surface elevations, flow velocities, arrival (lag) times for maximum values, and shear stress. In short, it can be used to route the individual “rainfall grids” and develop a hydraulic model that summarizes several flow results in waterways and other hydraulic conveyances as defined in the shape file / topography input.

Methods used in the software to estimate peak flows are similar to the TR-55 protocols described above. Most pertinently for this study, HEC-RAS was used to estimate water surface elevations (or flow depths) and velocity of runoff in and across the site during the specified rainfall event. This was done for existing and proposed conditions.

The scour on site is then calculated outside of HEC-RAS using the FHA equation published in “Hydraulic Engineering Circular No. 18”. This equation uses the flow depth, velocity, and a variety of constants to determine the scour depth. The reference equation is $y_s = 2.0 \times K_1 \times K_2 \times K_3 \times (a/y_1)^{0.65} \times F$, where K_1, K_2, and K_3 are constants, “a” is pier width, y_1 is depth and F is the Froude Number which is based on another common formula that relies on both depth and velocity.

11. HEC-RAS Input Parameters

HEC-RAS used a two-dimensional grid-based model that routed rainfall and runoff hydrographs over surface conditions using approximations similar to those described in TR-55 above. HEC-RAS produced not just peak flow rates and velocities in channel areas, but also peak flow depth estimates over the entire modeled surface. This is particularly useful where the project elements will be widely scattered.

The primary inputs are a digital terrain model, existing land cover, impervious percentages, existing runoff curve numbers (CN), soil types, precipitation values, and Manning's N values. No hydraulic structures, such as ponds, culverts, etc., were modeled in this preliminary analysis. As a result, roads, berms, and storm sewer are assumed to be overtopped.

Topography was provided for the Basin at approximately 10-meter spacing from the National Elevation Dataset (NED). On this project site, the project area was modeled using client provided surface data with a grid cell size of 50 feet squared. Each grid cell is read by the HEC-RAS program and averaged into a single elevation. The use of NED topography gives a reasonable estimate of runoff generated from beyond the project limits.

Rainfall was modelled for the 24-hr, 100-year storm event using the precipitation data described earlier (a copy is in the appendices). The 100-year storm is better termed a 1% annual chance storm. Also included in the model input data: NOAA Rainfall data and NRCS soil data for the region.

Existing land use was modeled using data from the National Land Cover Database (For exact inputs used in this study's modelling, see the appendices under existing (pre-development) conditions.)

12. HEC-RAS Results – Existing Conditions

The analysis looked at the water depth, water velocity and scour potential 100-year storm event modeling provided the following results. Exhibit maps showing the results are located in Appendix D.

The model shows that almost all of the site has flood depths less than 0.5'. However, there are small areas with flood depths from 0.5' to 1.0' and are located in the north central portion of the site and should not have a significant impact on the BESS site layout as these areas are not within the proposed BESS layout.

The model shows that the project has measurable velocity within the site. The maximum velocity is 1.55 fps, which occurs along the southern boundary of the site within the existing drainageway. However, a majority of the site has velocities less than 0.5 fps.

The analysis shows potential scour depth within the flooding areas. All scour on the site is under 1'. with, a majority of the site having scour less than 0.5'. The areas of 0.5' to 1.0' of scour are mainly located along the perimeter and the central portion of the site and should not have a significant impact on the BESS site layout as these areas are not within the proposed BESS layout.

13. HEC-RAS Results – Proposed Conditions

This analysis looks at the water depth, water velocity and scour potential from the 100-year storm event modeling. The proposed conditions model was completed with the existing grades since proposed grades were not available. This may impact the proposed condition results when proposed grades are modeled. Exhibit maps showing the results are provided in Appendix E.

The proposed model does not show a significant change in flood depths on the site. A majority of the proposed site still has flood depths less than 0.5'. A small area in the north central portion of the site has flood depths between 0.5' and 1.0'. Based on the current configuration of the BESS site this small portion of flood depths between 0.5' and 1.0' should not have a significant impact on the BESS site.

There is a slight increase in velocity in the proposed conditions compared to the existing conditions. A larger area now shows velocities between 0.50 to 0.75 fps. Isolated areas with velocities between 0.75 fps to 1.0 fps are also present on site, with the largest area located in the southwest portion of the site. These increased velocities are located in the center of the BESS site.

The proposed model indicates that scour depths are nearly unchanged. Areas of scour between 0.5’ and 1.0’ of depth increased slightly in the proposed condition. A majority of the site still has scour depths below 0.5’.

14. Hydrology Conclusions

Typically, BESS sites cannot have any amounts of flooding, no matter how minimal on the equipment pad during the 100-year storm event. In the proposed conditions (modeling the existing grades) there is flood depth between 0-0.5’. Since some minor flood depth is located within the BESS, it is recommended the site pad be lifted to at least 1’ above the anticipated flood depth.

Velocities over 4.0 fps and scour depths greater than 1.0’ require additional design considerations. Since the measured velocity is less than 4.0 fps, additional grading and/or BMPs to accommodate the runoff velocity are likely not to be needed. Further review of these measures should be completed during final design. The scour potential along the center of the site is lower than the recommended max of 1.0’ for the 100-year storm. Since the scour potential also does not exceed the maximum recommended 100-year storm value, additional grading and/or BMPs may not be needed.

During construction, measures should be taken to prevent erosion from taking place onsite and ensuring that sediment does not leave the site.

References

1. *Pinal County Arizona Drainage Manual Volume I and II*, August 2004

2. *Urban Hydrology for Small Watersheds, Technical Release 55*; US Dept of Agriculture, Natural Resources Conservation Service, June 1986

3. *HEC-RAS River Analysis System v6.0 Beta User's Manual*; US Army Corps of Engineers Hydrologic Engineering Center, December, 2020

4. *Stream Restoration Design Nation Engineering Handbook, Chapter 8 Threshold Channel Design*; Natural Resource Conservation Service, August, 2007

5. *Field Techniques for Estimating Water Fluxes Between Surface Water and Ground Water;* Charles J. Taylor and Earl A. Green, U.S. Geological Survey, 2008

6. *Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance-Third Edition, Volume 2, HEC No. 23*, US Department of Transportation Federal Highway Administration, September 2009

Appendix A - Site Information

Soils Map

FEMA FIRM Map

USGS Rainfall Data

Rainfall Distribution

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Eastern Pinal and Southern Gila Counties, Arizona; and Pinal County, Arizona, Western Part



January 5, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

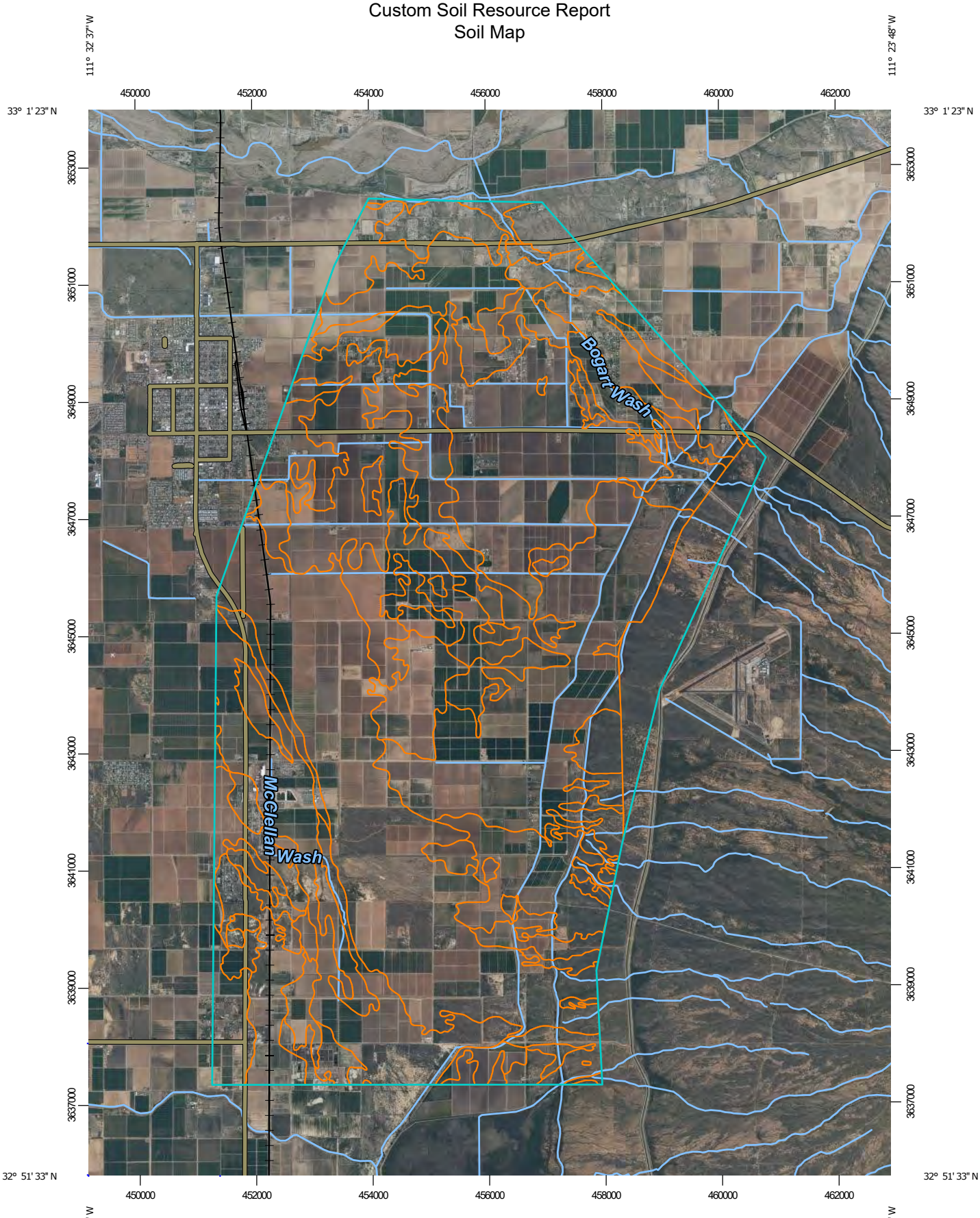
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:88,800 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4000 8000 16000 24000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Pinal and Southern Gila Counties, Arizona
Survey Area Data: Version 19, Sep 8, 2023

Soil Survey Area: Pinal County, Arizona, Western Part
Survey Area Data: Version 20, Sep 8, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 18, 2020—Mar 7, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
24	Contine loam, 0 to 3 percent slopes	2.9	0.0%
67	Mohall-Contine complex, 0 to 5 percent slopes	1,036.1	4.0%
Subtotals for Soil Survey Area		**1,039.0**	**4.0%**
Totals for Area of Interest		**26,098.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Casa Grande fine sandy loam, 0 to 3 percent slopes	4,570.6	17.5%
4	Casa Grande clay loam	178.3	0.7%
5	Cashion clay	68.2	0.3%
9	Contine clay loam	94.4	0.4%
11	Coolidge sandy loam	713.2	2.7%
13	Dateland fine sandy loam	1,192.2	4.6%
16	Denure sandy loam, 1 to 3 percent slopes	1,329.2	5.1%
19	Dumps-Pits association	67.8	0.3%
21	Gilman fine sandy loam, 0 to 2 percent slopes	1,201.5	4.6%
24	Glenbar clay loam, 0 to 2 percent slopes	1,146.2	4.4%
26	Gunsight-Pinamt complex, 1 to 8 percent slopes	482.3	1.8%
27	La Palma fine sandy loam	834.7	3.2%
28	Laveen loam	1,110.5	4.3%
30	Mohall sandy loam, 0 to 1 percent slopes	1,925.0	7.4%
31	Mohall loam MLRA 40	5,304.5	20.3%
32	Mohall clay loam	4,486.5	17.2%
42	Sasco silt loam	17.0	0.1%
43	Toltec fine sandy loam	337.1	1.3%
Subtotals for Soil Survey Area		**25,058.8**	**96.0%**
Totals for Area of Interest		**26,098.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eastern Pinal and Southern Gila Counties, Arizona

24—Contine loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: plj9
Elevation: 1,540 to 2,000 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Not prime farmland

Map Unit Composition

Contine and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Contine

Setting

Landform: Fan terraces, basin floors
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, dip, rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed fan alluvium

Typical profile

A - 0 to 2 inches: loam
Bt - 2 to 25 inches: clay loam
Btk1 - 25 to 35 inches: clay
Btk2 - 35 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB213AZ - Loamy Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

67—Mohall-Contine complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2262q
Elevation: 1,490 to 2,090 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Not prime farmland

Map Unit Composition

Mohall and similar soils: 60 percent
Contine and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed fan alluvium

Typical profile

A - 0 to 3 inches: silt loam
AC - 3 to 12 inches: silt loam
Bt - 12 to 32 inches: clay loam
Btk1 - 32 to 48 inches: clay loam
Btk2 - 48 to 60 inches: loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Maximum salinity: Nonsaline to strongly saline (0.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB213AZ - Loamy Upland 7"-10" p.z.
Hydric soil rating: No

Description of Contine

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed fan alluvium

Typical profile

A - 0 to 1 inches: clay loam
Bt - 1 to 12 inches: clay
Btk1 - 12 to 20 inches: clay
Btk2 - 20 to 60 inches: clay

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB207AZ - Limy Fan 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

Pinal County, Arizona, Western Part

3—Casa Grande fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tdtb
Elevation: 950 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Casa grande and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Casa Grande

Setting

Landform: Basin floors
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 13 inches: fine sandy loam
Btknz - 13 to 23 inches: sandy clay loam
Btkknz1 - 23 to 28 inches: sandy clay loam
Btkknz2 - 28 to 49 inches: sandy clay loam
2Bkknz - 49 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 13 to 23 inches to natric
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 200.0
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB225AZ - Loamy Upland, Saline 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

4—Casa Grande clay loam

Map Unit Setting

National map unit symbol: 1sqy
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Casa grande and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Casa Grande

Setting

Landform: Basin floors
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed stream alluvium

Typical profile

Ap - 0 to 13 inches: clay loam
Btkn - 13 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 200.0
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R040XB225AZ - Loamy Upland, Saline 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

5—Cashion clay

Map Unit Setting

National map unit symbol: 1sr9
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Cashion and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cashion

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent fine textured mixed stream alluvium

Typical profile

Ap - 0 to 12 inches: clay
C1 - 12 to 35 inches: clay
2C2 - 35 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C
Ecological site: R040XB203AZ - Clayey Swale 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

9—Contine clay loam

Map Unit Setting

National map unit symbol: 1srf
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Contine and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Contine

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine textured mixed fan alluvium

Typical profile

Ap - 0 to 12 inches: clay loam
Btk1 - 12 to 51 inches: clay
Btk2 - 51 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R040XB205AZ - Clay Loam Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

11—Coolidge sandy loam

Map Unit Setting

National map unit symbol: 1spy
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Coolidge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Coolidge

Setting

Landform: Stream terraces, fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Mixed stream and fan alluvium

Typical profile
A - 0 to 7 inches: sandy loam
Bk1 - 7 to 44 inches: sandy loam
Bk2 - 44 to 60 inches: sandy clay loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 40.0
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups
Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R040XB207AZ - Limy Fan 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils
Percent of map unit: 15 percent
Hydric soil rating: No

13—Dateland fine sandy loam

Map Unit Setting
National map unit symbol: 1sq0
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Dateland and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dateland

Setting

Landform: Fan terraces, stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed stream and fan alluvium

Typical profile

A - 0 to 2 inches: fine sandy loam
Bk - 2 to 40 inches: fine sandy loam
C - 40 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R040XB207AZ - Limy Fan 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

16—Denure sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1sq3
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Denure and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Denure

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed fan alluvium

Typical profile

A - 0 to 2 inches: sandy loam
Bk - 2 to 54 inches: sandy loam
2Btk - 54 to 60 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R040XB207AZ - Limy Fan 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

19—Dumps-Pits association

Map Unit Composition

Dumps: 59 percent
Pits: 29 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Unnamed soils

Percent of map unit: 12 percent
Hydric soil rating: No

21—Gilman fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tdtw
Elevation: 800 to 2,000 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Gilman and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilman

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed fan and stream alluvium

Typical profile

Ap1 - 0 to 3 inches: fine sandy loam
Ap2 - 3 to 13 inches: loam
C1 - 13 to 26 inches: loam
C2 - 26 to 44 inches: loam
C3 - 44 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: A
Ecological site: R040XB211AZ - Loamy Swale 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

24—Glenbar clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tdtq
Elevation: 980 to 2,000 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Glenbar and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glenbar

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Mixed stream alluvium

Typical profile

Ap - 0 to 7 inches: clay loam
Ck1 - 7 to 18 inches: clay loam
Ck2 - 18 to 31 inches: silty clay loam
Ck3 - 31 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB211AZ - Loamy Swale 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

26—Gunsight-Pinamt complex, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1sqg
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Not prime farmland

Map Unit Composition

Gunsight and similar soils: 57 percent
Pinamt and similar soils: 30 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gunsight

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Very gravelly mixed fan alluvium

Typical profile

A - 0 to 3 inches: very gravelly fine sandy loam
Bk1 - 3 to 12 inches: gravelly loam
Bk2 - 12 to 60 inches: very gravelly loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Gypsum, maximum content: 10 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: R040XB208AZ - Limy Upland, Deep 7"-10" p.z.
Hydric soil rating: No

Description of Pinamt

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed fan alluvium

Typical profile

A - 0 to 2 inches: very gravelly loam
Btk - 2 to 23 inches: very gravelly sandy clay loam
2Bk - 23 to 60 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 1 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R040XB208AZ - Limy Upland, Deep 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 13 percent
Hydric soil rating: No

27—La Palma fine sandy loam

Map Unit Setting

National map unit symbol: 1sqh
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Farmland of unique importance

Map Unit Composition

La palma and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of La Palma

Setting

Landform: Basin floors
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed stream alluvium and/or loamy mixed eolian deposits

Typical profile

A - 0 to 3 inches: fine sandy loam

Btkn - 3 to 28 inches: clay loam
2Bkm - 28 to 60 inches: cemented material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 20 to 40 inches to petrocalcic
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 60.0
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R040XB225AZ - Loamy Upland, Saline 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 5 percent
Hydric soil rating: No

28—Laveen loam

Map Unit Setting

National map unit symbol: 1sqj
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Laveen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laveen

Setting

Landform: Stream terraces, fan terraces
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed stream and fan alluvium

Typical profile

Ap - 0 to 15 inches: loam
Bk1 - 15 to 42 inches: loam
Bk2 - 42 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 40.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R040XB207AZ - Limy Fan 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

30—Mohall sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2x7ms
Elevation: 1,000 to 2,000 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Mohall and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Basin floors, fan remnants, stream terraces, alluvial fans
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Mixed alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

Ap - 0 to 16 inches: sandy loam
Bt - 16 to 24 inches: clay loam
Btkk1 - 24 to 37 inches: clay loam
Btkk2 - 37 to 43 inches: clay loam
Bkk - 43 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 1w
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB218AZ - Sandy Loam Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

31—Mohall loam MLRA 40

Map Unit Setting

National map unit symbol: 2rfkt

Elevation: 1,000 to 1,990 feet
Mean annual precipitation: 6 to 10 inches
Mean annual air temperature: 68 to 74 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Mohall and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Stream terraces, basin floors, fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, flat
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 16 inches: loam
Bt - 16 to 24 inches: clay loam
Btk1 - 24 to 37 inches: clay loam
Btk2 - 37 to 43 inches: clay loam
Bk - 43 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB213AZ - Loamy Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 20 percent
Hydric soil rating: No

32—Mohall clay loam

Map Unit Setting

National map unit symbol: 1sqp
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Mohall and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Fan terraces, basin floors
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed fan alluvium

Typical profile

Ap - 0 to 16 inches: clay loam
Btk - 16 to 43 inches: clay loam
Bk - 43 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB205AZ - Clay Loam Upland 7"-10" p.z.

Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

42—Sasco silt loam

Map Unit Setting

National map unit symbol: 1sr1
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Sasco and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sasco

Setting

Landform: Stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed stream silty alluvium

Typical profile

A - 0 to 2 inches: silt loam
Bw - 2 to 47 inches: silt loam
2Btb - 47 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB213AZ - Loamy Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

43—Toltec fine sandy loam

Map Unit Setting

National map unit symbol: 1sr2
Elevation: 1,190 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Toltec and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Toltec

Setting

Landform: Basin floors
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed stream alluvium and/or mixed eolian deposits

Typical profile

Ap - 0 to 12 inches: fine sandy loam
Bk - 12 to 36 inches: very fine sandy loam
Bkq - 36 to 60 inches: extremely gravelly fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: R040XB225AZ - Loamy Upland, Saline 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

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NRCS

Natural Resources Conservation Service

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Custom Soil Resource Report for Pinal County, Arizona, Western Part



May 14, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

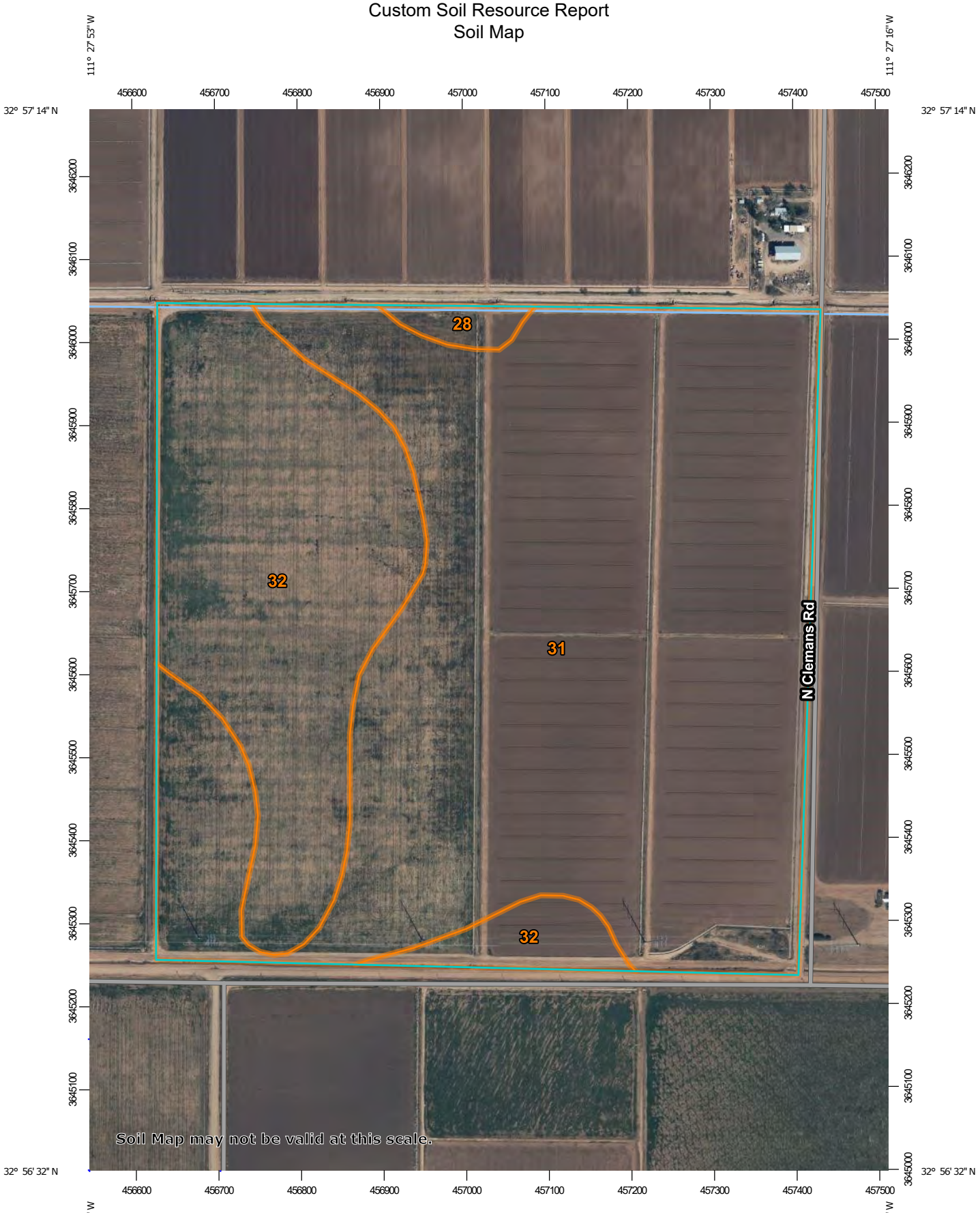
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:6,240 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pinal County, Arizona, Western Part
Survey Area Data: Version 20, Sep 8, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 18, 2020—Mar 7, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
28	Laveen loam	1.7	1.1%
31	Mohall loam MLRA 40	110.6	70.8%
32	Mohall clay loam	44.0	28.1%
Totals for Area of Interest		**156.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Pinal County, Arizona, Western Part

28—Laveen loam

Map Unit Setting

National map unit symbol: 1sqj
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Laveen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laveen

Setting

Landform: Stream terraces, fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed stream and fan alluvium

Typical profile

Ap - 0 to 15 inches: loam
Bk1 - 15 to 42 inches: loam
Bk2 - 42 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 40.0
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R040XB207AZ - Limy Fan 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent
Hydric soil rating: No

31—Mohall loam MLRA 40

Map Unit Setting

National map unit symbol: 2rfkt
Elevation: 1,000 to 1,990 feet
Mean annual precipitation: 6 to 10 inches
Mean annual air temperature: 68 to 74 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Mohall and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Stream terraces, basin floors, fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, flat
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 16 inches: loam
Bt - 16 to 24 inches: clay loam
Btk1 - 24 to 37 inches: clay loam
Btk2 - 37 to 43 inches: clay loam
Bk - 43 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB213AZ - Loamy Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 20 percent
Hydric soil rating: No

32—Mohall clay loam

Map Unit Setting

National map unit symbol: 1sqp
Elevation: 1,130 to 1,990 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Mohall and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Fan terraces, basin floors
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed fan alluvium

Typical profile

Ap - 0 to 16 inches: clay loam
Btk - 16 to 43 inches: clay loam
Bk - 43 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R040XB205AZ - Clay Loam Upland 7"-10" p.z.
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

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National Flood Hazard Layer FIRMette

FEMA

111°27'55"W 32°57'11"N



111°27'17"W 32°56'41"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

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
- 17.5 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

N

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 1/10/2024 at 11:24 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 date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

NOAA Atlas 14, Volume 1, Version 5
Location name: Coolidge, Arizona, USA*
Latitude: 32.9526°, Longitude: -111.4634°
Elevation: 1494 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.206 (0.177-0.245)	0.269 (0.233-0.320)	0.366 (0.314-0.433)	0.439 (0.375-0.516)	0.538 (0.453-0.630)	0.613 (0.508-0.715)	0.690 (0.564-0.804)	0.769 (0.617-0.897)	0.872 (0.681-1.02)	0.952 (0.728-1.12)
10-min	0.314 (0.270-0.373)	0.410 (0.355-0.487)	0.557 (0.478-0.658)	0.668 (0.571-0.786)	0.819 (0.689-0.958)	0.933 (0.774-1.09)	1.05 (0.858-1.22)	1.17 (0.938-1.36)	1.33 (1.04-1.55)	1.45 (1.11-1.71)
15-min	0.389 (0.335-0.462)	0.508 (0.440-0.604)	0.690 (0.592-0.816)	0.828 (0.707-0.974)	1.02 (0.854-1.19)	1.16 (0.959-1.35)	1.30 (1.06-1.52)	1.45 (1.16-1.69)	1.64 (1.29-1.93)	1.80 (1.37-2.12)
30-min	0.523 (0.451-0.622)	0.684 (0.593-0.813)	0.930 (0.797-1.10)	1.12 (0.953-1.31)	1.37 (1.15-1.60)	1.56 (1.29-1.82)	1.75 (1.43-2.04)	1.95 (1.57-2.28)	2.21 (1.73-2.59)	2.42 (1.85-2.85)
60-min	0.647 (0.558-0.770)	0.846 (0.734-1.01)	1.15 (0.987-1.36)	1.38 (1.18-1.62)	1.69 (1.42-1.98)	1.93 (1.60-2.25)	2.17 (1.77-2.53)	2.42 (1.94-2.82)	2.74 (2.14-3.21)	2.99 (2.29-3.53)
2-hr	0.748 (0.648-0.876)	0.970 (0.841-1.14)	1.30 (1.12-1.52)	1.54 (1.32-1.80)	1.88 (1.58-2.18)	2.14 (1.78-2.48)	2.41 (1.97-2.78)	2.68 (2.15-3.10)	3.04 (2.38-3.53)	3.33 (2.55-3.89)
3-hr	0.811 (0.702-0.949)	1.04 (0.901-1.22)	1.37 (1.18-1.60)	1.62 (1.39-1.89)	1.98 (1.68-2.30)	2.27 (1.88-2.62)	2.57 (2.10-2.97)	2.88 (2.31-3.33)	3.31 (2.58-3.84)	3.66 (2.78-4.26)
6-hr	0.980 (0.864-1.13)	1.24 (1.09-1.43)	1.59 (1.40-1.83)	1.86 (1.63-2.14)	2.25 (1.94-2.56)	2.55 (2.16-2.90)	2.86 (2.38-3.25)	3.18 (2.60-3.62)	3.61 (2.88-4.12)	3.96 (3.07-4.53)
12-hr	1.12 (1.00-1.27)	1.42 (1.27-1.61)	1.80 (1.60-2.04)	2.10 (1.86-2.36)	2.51 (2.19-2.81)	2.82 (2.44-3.15)	3.14 (2.67-3.53)	3.47 (2.90-3.89)	3.91 (3.19-4.42)	4.24 (3.40-4.84)
24-hr	1.27 (1.15-1.40)	1.61 (1.47-1.78)	2.09 (1.90-2.30)	2.46 (2.23-2.71)	2.99 (2.69-3.28)	3.40 (3.04-3.72)	3.83 (3.39-4.19)	4.27 (3.76-4.68)	4.88 (4.24-5.37)	5.37 (4.61-5.91)
2-day	1.35 (1.22-1.49)	1.72 (1.56-1.91)	2.26 (2.04-2.50)	2.69 (2.42-2.96)	3.28 (2.94-3.62)	3.76 (3.35-4.14)	4.25 (3.76-4.69)	4.77 (4.19-5.28)	5.50 (4.77-6.10)	6.08 (5.21-6.77)
3-day	1.43 (1.30-1.58)	1.82 (1.66-2.02)	2.40 (2.17-2.64)	2.85 (2.58-3.14)	3.50 (3.14-3.85)	4.02 (3.59-4.42)	4.56 (4.04-5.02)	5.14 (4.52-5.67)	5.95 (5.16-6.58)	6.60 (5.67-7.33)
4-day	1.51 (1.38-1.67)	1.92 (1.75-2.12)	2.53 (2.30-2.79)	3.02 (2.74-3.32)	3.72 (3.34-4.09)	4.28 (3.82-4.70)	4.87 (4.32-5.36)	5.50 (4.84-6.06)	6.40 (5.55-7.06)	7.12 (6.12-7.89)
7-day	1.68 (1.52-1.86)	2.14 (1.94-2.36)	2.81 (2.55-3.11)	3.36 (3.04-3.72)	4.13 (3.71-4.56)	4.76 (4.24-5.25)	5.42 (4.80-5.98)	6.12 (5.38-6.76)	7.12 (6.17-7.88)	7.92 (6.79-8.80)
10-day	1.82 (1.65-2.02)	2.33 (2.12-2.59)	3.06 (2.78-3.40)	3.65 (3.30-4.05)	4.48 (4.02-4.96)	5.14 (4.59-5.69)	5.84 (5.18-6.47)	6.58 (5.79-7.30)	7.61 (6.62-8.48)	8.45 (7.27-9.43)
20-day	2.25 (2.04-2.49)	2.90 (2.62-3.20)	3.81 (3.45-4.20)	4.51 (4.06-4.96)	5.44 (4.89-5.98)	6.16 (5.50-6.77)	6.89 (6.13-7.58)	7.63 (6.76-8.41)	8.63 (7.57-9.54)	9.40 (8.18-10.4)
30-day	2.65 (2.42-2.90)	3.40 (3.11-3.72)	4.46 (4.08-4.88)	5.28 (4.81-5.76)	6.36 (5.76-6.94)	7.20 (6.49-7.85)	8.05 (7.23-8.79)	8.92 (7.96-9.76)	10.1 (8.92-11.1)	11.0 (9.64-12.1)
45-day	3.08 (2.82-3.38)	3.97 (3.62-4.36)	5.21 (4.75-5.71)	6.12 (5.57-6.71)	7.33 (6.64-8.02)	8.24 (7.43-9.02)	9.15 (8.22-10.0)	10.1 (8.99-11.0)	11.2 (9.98-12.4)	12.1 (10.7-13.4)
60-day	3.43 (3.14-3.76)	4.42 (4.04-4.84)	5.79 (5.28-6.33)	6.78 (6.18-7.40)	8.07 (7.33-8.80)	9.03 (8.16-9.85)	9.98 (8.99-10.9)	10.9 (9.78-11.9)	12.1 (10.8-13.3)	13.0 (11.5-14.3)

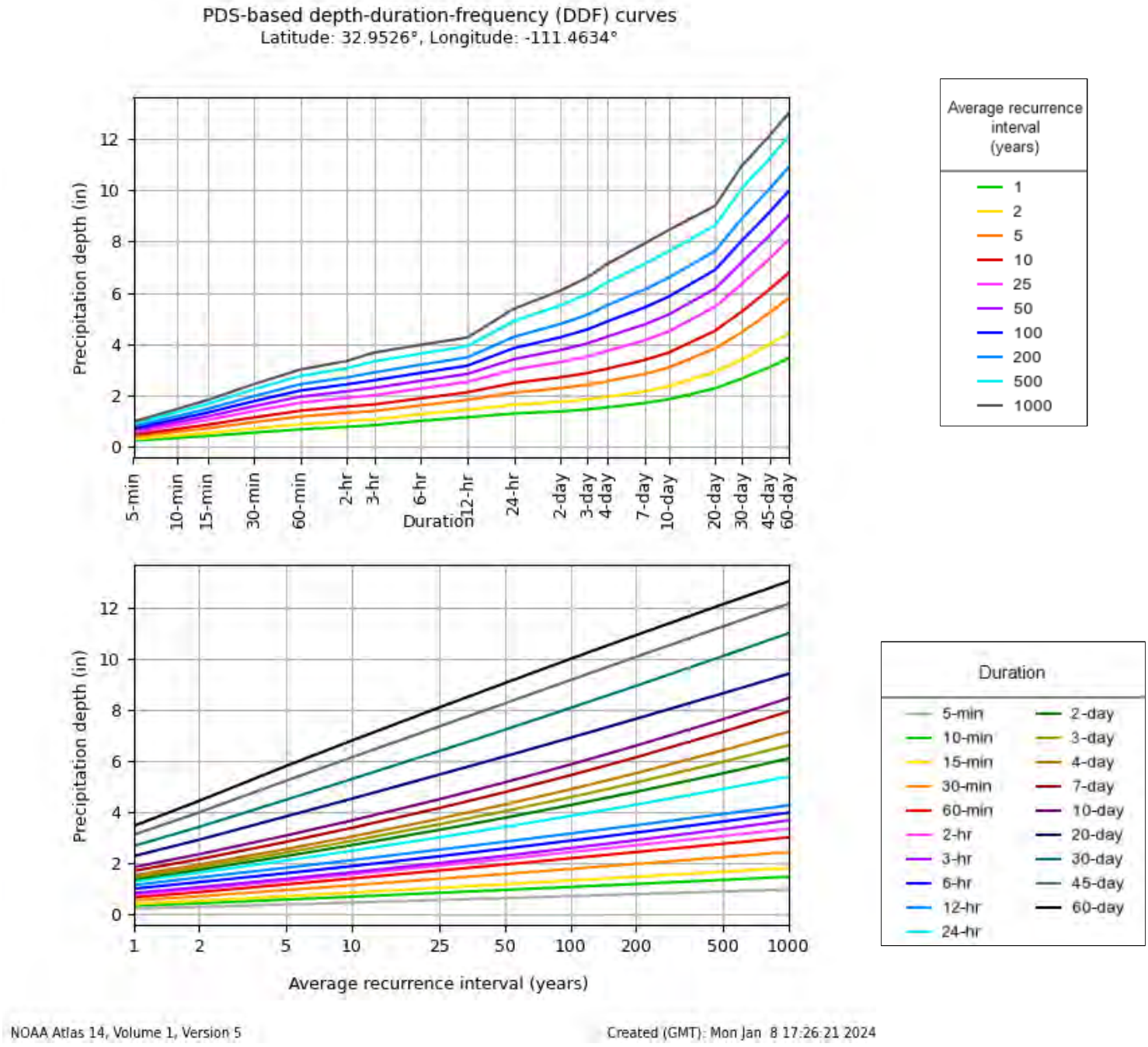
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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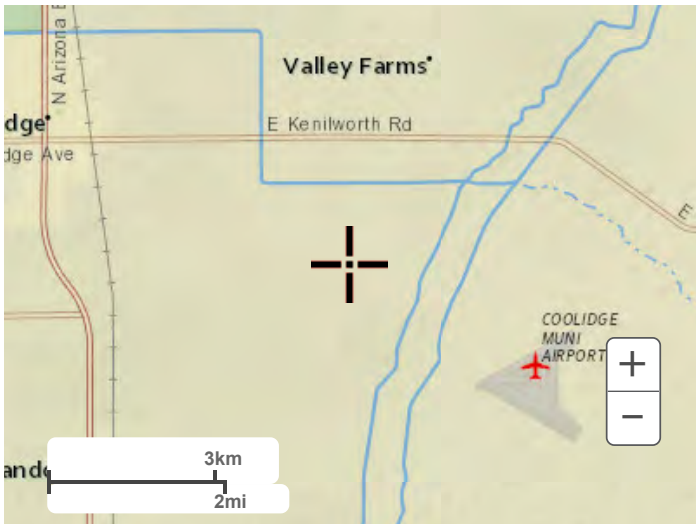
PF graphical



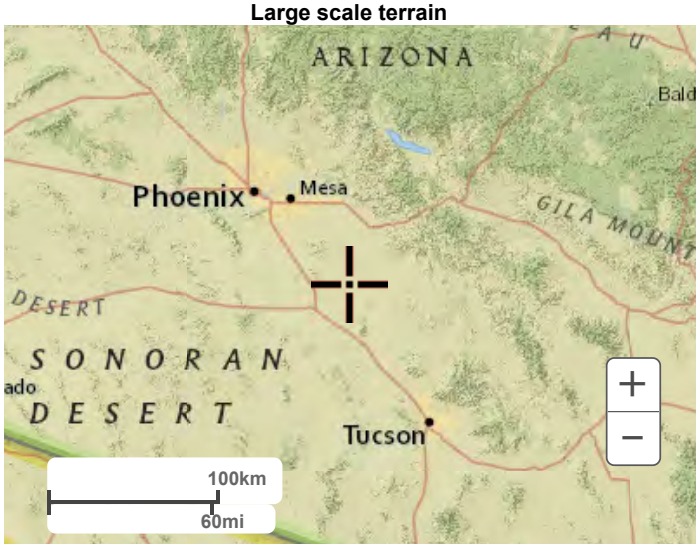
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Maps & aerials

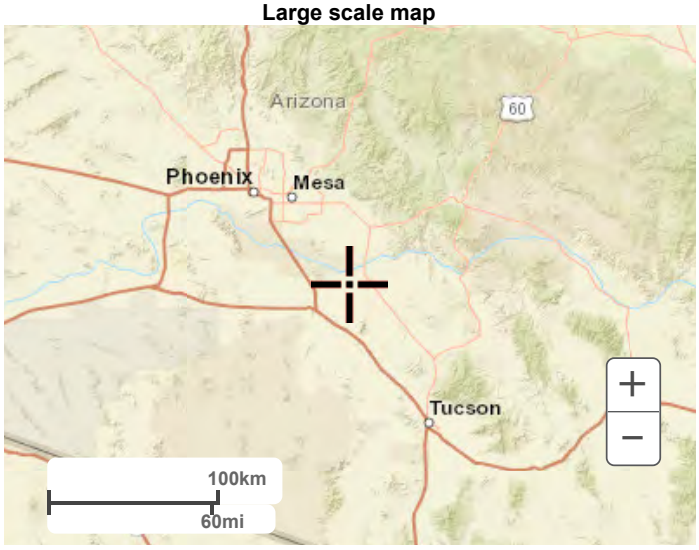
Small scale terrain



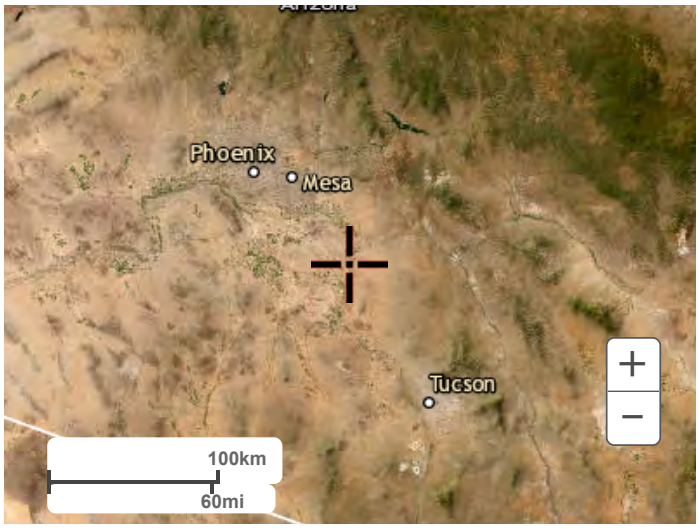
Large scale terrain



Large scale map



Large scale aerial



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Rainfall Distribution

Time	Time	Type II		10-Year		25-Year		50-Year		100-Year		500-Year	
Hrs	HH : MM	%		Depth=	2.46	Depth=	2.99	Depth=	3.4	Depth=	3.83	Depth=	4.88
0	00 : 00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	00 : 06	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004	0.005	0.005
0.2	00 : 12	0.002	0.001	0.005	0.002	0.006	0.003	0.007	0.003	0.008	0.004	0.010	0.005
0.3	00 : 18	0.003	0.001	0.008	0.003	0.009	0.003	0.010	0.004	0.012	0.004	0.015	0.005
0.4	00 : 24	0.004	0.001	0.010	0.003	0.012	0.003	0.014	0.004	0.016	0.004	0.020	0.005
0.5	00 : 30	0.005	0.001	0.013	0.003	0.015	0.003	0.017	0.004	0.020	0.004	0.025	0.005
0.6	00 : 36	0.006	0.001	0.015	0.003	0.018	0.003	0.021	0.004	0.024	0.004	0.030	0.005
0.7	00 : 42	0.007	0.001	0.018	0.003	0.022	0.003	0.025	0.004	0.028	0.004	0.035	0.005
0.8	00 : 48	0.008	0.001	0.020	0.003	0.025	0.003	0.028	0.004	0.032	0.004	0.041	0.005
0.9	00 : 54	0.009	0.001	0.023	0.003	0.028	0.003	0.032	0.004	0.036	0.004	0.046	0.005
1	01 : 00	0.011	0.001	0.026	0.003	0.031	0.003	0.036	0.004	0.040	0.004	0.051	0.005
1.1	01 : 06	0.012	0.001	0.029	0.003	0.035	0.003	0.039	0.004	0.044	0.004	0.057	0.005
1.2	01 : 12	0.013	0.001	0.031	0.003	0.038	0.003	0.043	0.004	0.049	0.004	0.062	0.005
1.3	01 : 18	0.014	0.001	0.034	0.003	0.041	0.003	0.047	0.004	0.053	0.004	0.068	0.006
1.4	01 : 24	0.015	0.001	0.037	0.003	0.045	0.003	0.051	0.004	0.057	0.004	0.073	0.006
1.5	01 : 30	0.016	0.001	0.040	0.003	0.048	0.003	0.055	0.004	0.062	0.004	0.079	0.006
1.6	01 : 36	0.017	0.001	0.043	0.003	0.052	0.003	0.059	0.004	0.066	0.004	0.084	0.006
1.7	01 : 42	0.018	0.001	0.045	0.003	0.055	0.003	0.063	0.004	0.071	0.004	0.090	0.006
1.8	01 : 48	0.020	0.001	0.048	0.003	0.059	0.003	0.067	0.004	0.075	0.004	0.096	0.006
1.9	01 : 54	0.021	0.001	0.051	0.003	0.062	0.004	0.071	0.004	0.080	0.005	0.102	0.006
2	02 : 00	0.022	0.001	0.054	0.003	0.066	0.004	0.075	0.004	0.084	0.005	0.107	0.006
2.1	02 : 06	0.023	0.001	0.057	0.003	0.069	0.004	0.079	0.004	0.089	0.005	0.113	0.006
2.2	02 : 12	0.024	0.001	0.060	0.003	0.073	0.004	0.083	0.004	0.094	0.005	0.119	0.006
2.3	02 : 18	0.026	0.001	0.063	0.003	0.077	0.004	0.087	0.004	0.098	0.005	0.125	0.006
2.4	02 : 24	0.027	0.001	0.066	0.003	0.080	0.004	0.091	0.004	0.103	0.005	0.131	0.006
2.5	02 : 30	0.028	0.001	0.069	0.003	0.084	0.004	0.096	0.004	0.108	0.005	0.137	0.006
2.6	02 : 36	0.029	0.001	0.072	0.003	0.088	0.004	0.100	0.004	0.113	0.005	0.143	0.006
2.7	02 : 42	0.031	0.001	0.075	0.003	0.092	0.004	0.104	0.004	0.117	0.005	0.150	0.006
2.8	02 : 48	0.032	0.001	0.079	0.003	0.095	0.004	0.109	0.004	0.122	0.005	0.156	0.006
2.9	02 : 54	0.033	0.001	0.082	0.003	0.099	0.004	0.113	0.004	0.127	0.005	0.162	0.006
3	03 : 00	0.035	0.001	0.085	0.003	0.103	0.004	0.117	0.004	0.132	0.005	0.168	0.006
3.1	03 : 06	0.036	0.001	0.088	0.003	0.107	0.004	0.122	0.004	0.137	0.005	0.175	0.006
3.2	03 : 12	0.037	0.001	0.091	0.003	0.111	0.004	0.126	0.004	0.142	0.005	0.181	0.006
3.3	03 : 18	0.038	0.001	0.095	0.003	0.115	0.004	0.131	0.005	0.147	0.005	0.188	0.006
3.4	03 : 24	0.040	0.001	0.098	0.003	0.119	0.004	0.135	0.005	0.152	0.005	0.194	0.006
3.5	03 : 30	0.041	0.001	0.101	0.003	0.123	0.004	0.140	0.005	0.158	0.005	0.201	0.007
3.6	03 : 36	0.042	0.001	0.105	0.003	0.127	0.004	0.144	0.005	0.163	0.005	0.207	0.007
3.7	03 : 42	0.044	0.001	0.108	0.003	0.131	0.004	0.149	0.005	0.168	0.005	0.214	0.007
3.8	03 : 48	0.045	0.001	0.111	0.003	0.135	0.004	0.154	0.005	0.173	0.005	0.221	0.007
3.9	03 : 54	0.047	0.001	0.115	0.003	0.139	0.004	0.158	0.005	0.179	0.005	0.227	0.007
4	04 : 00	0.048	0.001	0.118	0.003	0.144	0.004	0.163	0.005	0.184	0.005	0.234	0.007
4.1	04 : 06	0.049	0.001	0.122	0.003	0.148	0.004	0.168	0.005	0.189	0.005	0.241	0.007
4.2	04 : 12	0.051	0.001	0.125	0.004	0.152	0.004	0.173	0.005	0.195	0.005	0.248	0.007
4.3	04 : 18	0.052	0.001	0.129	0.004	0.156	0.004	0.178	0.005	0.200	0.006	0.255	0.007
4.4	04 : 24	0.054	0.001	0.132	0.004	0.161	0.004	0.183	0.005	0.206	0.006	0.262	0.007
4.5	04 : 30	0.055	0.001	0.136	0.004	0.165	0.004	0.188	0.005	0.212	0.006	0.270	0.007
4.6	04 : 36	0.057	0.002	0.140	0.004	0.170	0.005	0.193	0.005	0.217	0.006	0.277	0.007
4.7	04 : 42	0.058	0.002	0.143	0.004	0.174	0.005	0.198	0.005	0.223	0.006	0.284	0.007
4.8	04 : 48	0.060	0.002	0.147	0.004	0.179	0.005	0.203	0.005	0.229	0.006	0.292	0.008
4.9	04 : 54	0.061	0.002	0.151	0.004	0.184	0.005	0.209	0.005	0.235	0.006	0.300	0.008
5	05 : 00	0.063	0.002	0.155	0.004	0.188	0.005	0.214	0.005	0.241	0.006	0.307	0.008
5.1	05 : 06	0.065	0.002	0.159	0.004	0.193	0.005	0.220	0.005	0.247	0.006	0.315	0.008
5.2	05 : 12	0.066	0.002	0.163	0.004	0.198	0.005	0.225	0.006	0.254	0.006	0.323	0.008
5.3	05 : 18	0.068	0.002	0.167	0.004	0.203	0.005	0.231	0.006	0.260	0.006	0.331	0.008
5.4	05 : 24	0.070	0.002	0.171	0.004	0.208	0.005	0.237	0.006	0.266	0.006	0.339	0.008
5.5	05 : 30	0.071	0.002	0.175	0.004	0.213	0.005	0.242	0.006	0.273	0.006	0.348	0.008
5.6	05 : 36	0.073	0.002	0.179	0.004	0.218	0.005	0.248	0.006	0.279	0.007	0.356	0.008
5.7	05 : 42	0.075	0.002	0.184	0.004	0.223	0.005	0.254	0.006	0.286	0.007	0.364	0.008
5.8	05 : 48	0.076	0.002	0.188	0.004	0.229	0.005	0.260	0.006	0.293	0.007	0.373	0.009
5.9	05 : 54	0.078	0.002	0.192	0.004	0.234	0.005	0.266	0.006	0.300	0.007	0.382	0.009
6	05 : 60	0.080	0.002	0.197	0.004	0.239	0.005	0.272	0.006	0.306	0.007	0.390	0.009
6.1	06 : 06	0.082	0.002	0.201	0.004	0.245	0.005	0.278	0.006	0.313	0.007	0.399	0.009
6.2	06 : 12	0.084	0.002	0.206	0.005	0.250	0.005	0.284	0.006	0.320	0.007	0.408	0.009
6.3	06 : 18	0.085	0.002	0.210	0.005	0.256	0.006	0.291	0.006	0.327	0.007	0.417	0.009

Time	Time	Type II		10-Year		25-Year		50-Year		100-Year		500-Year	
Hrs	HH : MM	%		Depth=	2.46	Depth=	2.99	Depth=	3.4	Depth=	3.83	Depth=	4.88
6.4	06 : 24	0.087	0.002	0.215	0.005	0.261	0.006	0.297	0.006	0.335	0.007	0.426	0.009
6.5	06 : 30	0.089	0.002	0.220	0.005	0.267	0.006	0.303	0.006	0.342	0.007	0.436	0.009
6.6	06 : 36	0.091	0.002	0.224	0.005	0.273	0.006	0.310	0.006	0.349	0.007	0.445	0.009
6.7	06 : 42	0.093	0.002	0.229	0.005	0.278	0.006	0.317	0.007	0.357	0.007	0.454	0.009
6.8	06 : 48	0.095	0.002	0.234	0.005	0.284	0.006	0.323	0.007	0.364	0.007	0.464	0.010
6.9	06 : 54	0.097	0.002	0.239	0.005	0.290	0.006	0.330	0.007	0.372	0.008	0.473	0.010
7	06 : 60	0.099	0.002	0.244	0.005	0.296	0.006	0.337	0.007	0.379	0.008	0.483	0.010
7.1	07 : 06	0.101	0.002	0.248	0.005	0.302	0.006	0.343	0.007	0.387	0.008	0.493	0.010
7.2	07 : 12	0.103	0.002	0.253	0.005	0.308	0.006	0.350	0.007	0.395	0.008	0.503	0.010
7.3	07 : 18	0.105	0.002	0.259	0.005	0.314	0.006	0.357	0.007	0.402	0.008	0.513	0.010
7.4	07 : 24	0.107	0.002	0.264	0.005	0.320	0.006	0.364	0.007	0.410	0.008	0.523	0.010
7.5	07 : 30	0.109	0.002	0.269	0.005	0.327	0.006	0.371	0.007	0.418	0.008	0.533	0.010
7.6	07 : 36	0.111	0.002	0.274	0.005	0.333	0.006	0.379	0.007	0.427	0.008	0.543	0.010
7.7	07 : 42	0.113	0.002	0.279	0.005	0.339	0.006	0.386	0.007	0.435	0.008	0.554	0.010
7.8	07 : 48	0.116	0.002	0.284	0.005	0.346	0.006	0.393	0.007	0.443	0.008	0.564	0.010
7.9	07 : 54	0.118	0.002	0.290	0.005	0.352	0.006	0.401	0.007	0.451	0.008	0.575	0.011
8	07 : 60	0.120	0.002	0.295	0.005	0.359	0.007	0.408	0.007	0.460	0.008	0.586	0.011
8.1	08 : 06	0.122	0.002	0.301	0.006	0.366	0.007	0.416	0.008	0.468	0.009	0.597	0.011
8.2	08 : 12	0.125	0.002	0.307	0.006	0.373	0.007	0.424	0.008	0.477	0.009	0.608	0.011
8.3	08 : 18	0.127	0.002	0.313	0.006	0.380	0.007	0.432	0.008	0.487	0.009	0.620	0.012
8.4	08 : 24	0.130	0.003	0.319	0.006	0.388	0.008	0.441	0.009	0.496	0.010	0.632	0.012
8.5	08 : 30	0.132	0.003	0.325	0.007	0.395	0.008	0.450	0.009	0.507	0.010	0.645	0.013
8.6	08 : 36	0.135	0.003	0.332	0.007	0.404	0.008	0.459	0.009	0.517	0.011	0.659	0.013
8.7	08 : 42	0.138	0.003	0.339	0.007	0.412	0.009	0.469	0.010	0.528	0.011	0.673	0.014
8.8	08 : 48	0.141	0.003	0.346	0.007	0.421	0.009	0.479	0.010	0.539	0.011	0.687	0.014
8.9	08 : 54	0.144	0.003	0.354	0.008	0.430	0.009	0.489	0.010	0.551	0.012	0.702	0.015
9	08 : 60	0.147	0.003	0.362	0.008	0.440	0.009	0.500	0.011	0.563	0.012	0.717	0.015
9.1	09 : 06	0.150	0.003	0.369	0.008	0.449	0.010	0.511	0.011	0.575	0.012	0.733	0.016
9.2	09 : 12	0.153	0.003	0.377	0.008	0.459	0.010	0.522	0.011	0.588	0.012	0.749	0.016
9.3	09 : 18	0.157	0.003	0.385	0.008	0.468	0.010	0.532	0.011	0.600	0.012	0.764	0.016
9.4	09 : 24	0.160	0.003	0.393	0.008	0.478	0.010	0.543	0.011	0.612	0.012	0.780	0.016
9.5	09 : 30	0.163	0.003	0.401	0.008	0.487	0.010	0.554	0.011	0.624	0.012	0.795	0.016
9.6	09 : 36	0.166	0.003	0.409	0.008	0.497	0.010	0.565	0.011	0.637	0.013	0.811	0.016
9.7	09 : 42	0.170	0.003	0.418	0.008	0.507	0.010	0.577	0.012	0.650	0.013	0.828	0.017
9.8	09 : 48	0.173	0.004	0.426	0.009	0.518	0.011	0.589	0.012	0.664	0.014	0.846	0.018
9.9	09 : 54	0.177	0.004	0.436	0.009	0.529	0.011	0.602	0.013	0.678	0.014	0.864	0.018
10	09 : 60	0.181	0.004	0.445	0.010	0.541	0.012	0.615	0.013	0.693	0.015	0.883	0.019
10.1	10 : 06	0.185	0.004	0.455	0.010	0.554	0.012	0.629	0.014	0.709	0.016	0.903	0.020
10.2	10 : 12	0.189	0.004	0.466	0.011	0.567	0.013	0.644	0.015	0.726	0.017	0.925	0.021
10.3	10 : 18	0.194	0.005	0.477	0.011	0.580	0.014	0.660	0.016	0.743	0.018	0.947	0.022
10.4	10 : 24	0.199	0.005	0.489	0.012	0.595	0.014	0.676	0.016	0.762	0.019	0.971	0.024
10.5	10 : 30	0.204	0.005	0.502	0.012	0.610	0.015	0.694	0.017	0.781	0.019	0.996	0.025
10.6	10 : 36	0.209	0.005	0.515	0.013	0.626	0.016	0.712	0.018	0.802	0.021	1.022	0.026
10.7	10 : 42	0.215	0.006	0.529	0.014	0.643	0.017	0.732	0.020	0.824	0.022	1.050	0.028
10.8	10 : 48	0.221	0.006	0.545	0.015	0.662	0.019	0.753	0.021	0.848	0.024	1.080	0.030
10.9	10 : 54	0.228	0.007	0.561	0.016	0.682	0.020	0.775	0.022	0.873	0.025	1.113	0.032
11	11 : 00	0.235	0.007	0.578	0.017	0.703	0.021	0.799	0.024	0.900	0.027	1.147	0.034
11.1	11 : 06	0.243	0.008	0.597	0.019	0.726	0.023	0.825	0.026	0.929	0.029	1.184	0.037
11.2	11 : 12	0.251	0.009	0.618	0.021	0.751	0.026	0.854	0.029	0.963	0.033	1.226	0.042
11.3	11 : 18	0.261	0.010	0.642	0.024	0.780	0.029	0.887	0.033	0.999	0.037	1.273	0.047
11.4	11 : 24	0.271	0.011	0.668	0.026	0.812	0.032	0.923	0.036	1.040	0.040	1.325	0.052
11.5	11 : 30	0.283	0.012	0.696	0.028	0.846	0.034	0.962	0.039	1.084	0.044	1.381	0.056
11.6	11 : 36	0.307	0.024	0.755	0.059	0.917	0.071	1.043	0.081	1.175	0.091	1.497	0.116
11.7	11 : 42	0.354	0.048	0.872	0.117	1.060	0.142	1.205	0.162	1.357	0.182	1.729	0.232
11.8	11 : 48	0.431	0.076	1.060	0.188	1.288	0.229	1.465	0.260	1.650	0.293	2.102	0.373
11.9	11 : 54	0.568	0.137	1.397	0.337	1.698	0.410	1.931	0.466	2.175	0.525	2.771	0.669
12	12 : 00	0.663	0.095	1.631	0.234	1.982	0.284	2.254	0.323	2.539	0.364	3.235	0.464
12.1	12 : 06	0.682	0.019	1.678	0.047	2.039	0.057	2.319	0.064	2.612	0.073	3.328	0.093
12.2	12 : 12	0.699	0.017	1.719	0.041	2.089	0.050	2.375	0.057	2.676	0.064	3.409	0.081
12.3	12 : 18	0.713	0.014	1.754	0.035	2.132	0.043	2.424	0.049	2.731	0.055	3.480	0.070
12.4	12 : 24	0.725	0.012	1.784	0.030	2.168	0.036	2.466	0.041	2.777	0.046	3.539	0.059
12.5	12 : 30	0.735	0.010	1.808	0.024	2.198	0.029	2.499	0.033	2.815	0.038	3.587	0.048
12.6	12 : 36	0.743	0.008	1.829	0.021	2.223	0.025	2.528	0.029	2.847	0.032	3.628	0.041
12.7	12 : 42	0.751	0.008	1.848	0.019	2.247	0.024	2.555	0.027	2.878	0.030	3.667	0.039
12.8	12 : 48	0.759	0.007	1.867	0.018	2.269	0.022	2.580	0.025	2.906	0.028	3.703	0.036
12.9	12 : 54	0.766	0.007	1.883	0.017	2.289	0.021	2.603	0.023	2.932	0.026	3.736	0.034

Time	Time	Type II		10-Year		25-Year		50-Year		100-Year		500-Year	
Hrs	HH : MM	%		Depth=	2.46	Depth=	2.99	Depth=	3.4	Depth=	3.83	Depth=	4.88
13	13 : 00	0.772	0.006	1.899	0.016	2.308	0.019	2.625	0.022	2.957	0.024	3.767	0.031
13.1	13 : 06	0.778	0.006	1.914	0.015	2.326	0.018	2.645	0.020	2.980	0.023	3.796	0.029
13.2	13 : 12	0.784	0.006	1.928	0.014	2.343	0.017	2.664	0.019	3.001	0.022	3.824	0.028
13.3	13 : 18	0.789	0.005	1.941	0.013	2.359	0.016	2.683	0.018	3.022	0.021	3.851	0.026
13.4	13 : 24	0.794	0.005	1.954	0.013	2.375	0.015	2.700	0.017	3.042	0.020	3.876	0.025
13.5	13 : 30	0.799	0.005	1.966	0.012	2.389	0.014	2.717	0.016	3.060	0.019	3.899	0.024
13.6	13 : 36	0.804	0.005	1.977	0.011	2.403	0.014	2.732	0.016	3.078	0.018	3.922	0.022
13.7	13 : 42	0.808	0.004	1.988	0.011	2.416	0.013	2.747	0.015	3.095	0.017	3.943	0.021
13.8	13 : 48	0.812	0.004	1.998	0.010	2.428	0.013	2.761	0.014	3.111	0.016	3.964	0.020
13.9	13 : 54	0.816	0.004	2.008	0.010	2.440	0.012	2.775	0.014	3.126	0.015	3.983	0.020
14	14 : 00	0.820	0.004	2.017	0.009	2.452	0.011	2.788	0.013	3.141	0.015	4.002	0.019
14.1	14 : 06	0.824	0.004	2.026	0.009	2.463	0.011	2.800	0.012	3.155	0.014	4.020	0.018
14.2	14 : 12	0.827	0.004	2.035	0.009	2.474	0.011	2.813	0.012	3.168	0.014	4.037	0.018
14.3	14 : 18	0.831	0.004	2.044	0.009	2.484	0.011	2.825	0.012	3.182	0.014	4.054	0.017
14.4	14 : 24	0.834	0.003	2.052	0.008	2.494	0.010	2.836	0.012	3.195	0.013	4.071	0.017
14.5	14 : 30	0.838	0.003	2.061	0.008	2.505	0.010	2.848	0.012	3.208	0.013	4.088	0.017
14.6	14 : 36	0.841	0.003	2.069	0.008	2.514	0.010	2.859	0.011	3.221	0.013	4.104	0.016
14.7	14 : 42	0.844	0.003	2.077	0.008	2.524	0.010	2.870	0.011	3.233	0.012	4.120	0.016
14.8	14 : 48	0.847	0.003	2.085	0.008	2.534	0.009	2.881	0.011	3.245	0.012	4.135	0.015
14.9	14 : 54	0.850	0.003	2.092	0.008	2.543	0.009	2.892	0.011	3.257	0.012	4.150	0.015
15	15 : 00	0.854	0.003	2.100	0.007	2.552	0.009	2.902	0.010	3.269	0.012	4.165	0.015
15.1	15 : 06	0.856	0.003	2.107	0.007	2.561	0.009	2.912	0.010	3.280	0.011	4.180	0.014
15.2	15 : 12	0.859	0.003	2.114	0.007	2.569	0.009	2.922	0.010	3.291	0.011	4.194	0.014
15.3	15 : 18	0.862	0.003	2.121	0.007	2.578	0.008	2.931	0.010	3.302	0.011	4.207	0.014
15.4	15 : 24	0.865	0.003	2.128	0.007	2.586	0.008	2.941	0.009	3.313	0.011	4.221	0.013
15.5	15 : 30	0.868	0.003	2.134	0.007	2.594	0.008	2.950	0.009	3.323	0.010	4.234	0.013
15.6	15 : 36	0.870	0.003	2.141	0.006	2.602	0.008	2.959	0.009	3.333	0.010	4.247	0.013
15.7	15 : 42	0.873	0.003	2.147	0.006	2.610	0.008	2.967	0.009	3.343	0.010	4.259	0.012
15.8	15 : 48	0.875	0.002	2.153	0.006	2.617	0.007	2.976	0.008	3.352	0.009	4.271	0.012
15.9	15 : 54	0.878	0.002	2.159	0.006	2.624	0.007	2.984	0.008	3.361	0.009	4.283	0.012
16	16 : 00	0.880	0.002	2.165	0.006	2.631	0.007	2.992	0.008	3.370	0.009	4.294	0.011
16.1	16 : 06	0.882	0.002	2.170	0.006	2.638	0.007	3.000	0.008	3.379	0.009	4.306	0.011
16.2	16 : 12	0.885	0.002	2.176	0.006	2.645	0.007	3.007	0.008	3.388	0.009	4.317	0.011
16.3	16 : 18	0.887	0.002	2.182	0.006	2.652	0.007	3.015	0.008	3.396	0.009	4.328	0.011
16.4	16 : 24	0.889	0.002	2.187	0.005	2.658	0.007	3.023	0.008	3.405	0.008	4.338	0.011
16.5	16 : 30	0.891	0.002	2.192	0.005	2.665	0.007	3.030	0.007	3.413	0.008	4.349	0.011
16.6	16 : 36	0.893	0.002	2.198	0.005	2.671	0.006	3.037	0.007	3.422	0.008	4.360	0.011
16.7	16 : 42	0.895	0.002	2.203	0.005	2.678	0.006	3.045	0.007	3.430	0.008	4.370	0.010
16.8	16 : 48	0.898	0.002	2.208	0.005	2.684	0.006	3.052	0.007	3.438	0.008	4.380	0.010
16.9	16 : 54	0.900	0.002	2.213	0.005	2.690	0.006	3.059	0.007	3.446	0.008	4.390	0.010
17	17 : 00	0.902	0.002	2.218	0.005	2.696	0.006	3.066	0.007	3.454	0.008	4.401	0.010
17.1	17 : 06	0.904	0.002	2.223	0.005	2.702	0.006	3.073	0.007	3.462	0.008	4.410	0.010
17.2	17 : 12	0.906	0.002	2.228	0.005	2.708	0.006	3.080	0.007	3.469	0.008	4.420	0.010
17.3	17 : 18	0.908	0.002	2.233	0.005	2.714	0.006	3.086	0.007	3.477	0.008	4.430	0.010
17.4	17 : 24	0.910	0.002	2.238	0.005	2.720	0.006	3.093	0.007	3.484	0.008	4.440	0.010
17.5	17 : 30	0.912	0.002	2.243	0.005	2.726	0.006	3.100	0.007	3.492	0.007	4.449	0.009
17.6	17 : 36	0.914	0.002	2.247	0.005	2.732	0.006	3.106	0.006	3.499	0.007	4.458	0.009
17.7	17 : 42	0.915	0.002	2.252	0.005	2.737	0.006	3.113	0.006	3.506	0.007	4.468	0.009
17.8	17 : 48	0.917	0.002	2.257	0.005	2.743	0.006	3.119	0.006	3.513	0.007	4.477	0.009
17.9	17 : 54	0.919	0.002	2.261	0.005	2.748	0.006	3.125	0.006	3.520	0.007	4.486	0.009
18	18 : 00	0.921	0.002	2.266	0.004	2.754	0.005	3.131	0.006	3.527	0.007	4.494	0.009
18.1	18 : 06	0.923	0.002	2.270	0.004	2.759	0.005	3.137	0.006	3.534	0.007	4.503	0.009
18.2	18 : 12	0.925	0.002	2.274	0.004	2.764	0.005	3.143	0.006	3.541	0.007	4.512	0.009
18.3	18 : 18	0.926	0.002	2.279	0.004	2.770	0.005	3.149	0.006	3.548	0.007	4.520	0.008
18.4	18 : 24	0.928	0.002	2.283	0.004	2.775	0.005	3.155	0.006	3.554	0.007	4.529	0.008
18.5	18 : 30	0.930	0.002	2.287	0.004	2.780	0.005	3.161	0.006	3.561	0.006	4.537	0.008
18.6	18 : 36	0.931	0.002	2.291	0.004	2.785	0.005	3.167	0.006	3.567	0.006	4.545	0.008
18.7	18 : 42	0.933	0.002	2.295	0.004	2.790	0.005	3.172	0.006	3.573	0.006	4.553	0.008
18.8	18 : 48	0.935	0.002	2.299	0.004	2.794	0.005	3.178	0.005	3.580	0.006	4.561	0.008
18.9	18 : 54	0.936	0.002	2.303	0.004	2.799	0.005	3.183	0.005	3.586	0.006	4.569	0.008
19	19 : 00	0.938	0.002	2.307	0.004	2.804	0.005	3.188	0.005	3.592	0.006	4.576	0.008
19.1	19 : 06	0.939	0.002	2.311	0.004	2.808	0.005	3.194	0.005	3.597	0.006	4.584	0.008
19.2	19 : 12	0.941	0.002	2.314	0.004	2.813	0.005	3.199	0.005	3.603	0.006	4.591	0.007
19.3	19 : 18	0.942	0.001	2.318	0.004	2.817	0.004	3.204	0.005	3.609	0.006	4.598	0.007
19.4	19 : 24	0.944	0.001	2.322	0.004	2.822	0.004	3.209	0.005	3.615	0.006	4.606	0.007
19.5	19 : 30	0.945	0.001	2.325	0.004	2.826	0.004	3.214	0.005	3.620	0.006	4.613	0.007

Time	Time	Type II		10-Year		25-Year		50-Year		100-Year		500-Year	
Hrs	HH : MM	%		Depth=	2.46	Depth=	2.99	Depth=	3.4	Depth=	3.83	Depth=	4.88
19.6	19 : 36	0.947	0.001	2.329	0.003	2.830	0.004	3.218	0.005	3.625	0.005	4.619	0.007
19.7	19 : 42	0.948	0.001	2.332	0.003	2.834	0.004	3.223	0.005	3.631	0.005	4.626	0.007
19.8	19 : 48	0.949	0.001	2.335	0.003	2.839	0.004	3.228	0.005	3.636	0.005	4.633	0.007
19.9	19 : 54	0.951	0.001	2.339	0.003	2.843	0.004	3.232	0.005	3.641	0.005	4.639	0.007
20	20 : 00	0.952	0.001	2.342	0.003	2.846	0.004	3.237	0.004	3.646	0.005	4.646	0.006
20.1	20 : 06	0.953	0.001	2.345	0.003	2.850	0.004	3.241	0.004	3.651	0.005	4.652	0.006
20.2	20 : 12	0.955	0.001	2.348	0.003	2.854	0.004	3.246	0.004	3.656	0.005	4.658	0.006
20.3	20 : 18	0.956	0.001	2.351	0.003	2.858	0.004	3.250	0.004	3.661	0.005	4.665	0.006
20.4	20 : 24	0.957	0.001	2.355	0.003	2.862	0.004	3.254	0.004	3.666	0.005	4.671	0.006
20.5	20 : 30	0.958	0.001	2.358	0.003	2.866	0.004	3.259	0.004	3.671	0.005	4.677	0.006
20.6	20 : 36	0.960	0.001	2.361	0.003	2.870	0.004	3.263	0.004	3.676	0.005	4.683	0.006
20.7	20 : 42	0.961	0.001	2.364	0.003	2.873	0.004	3.267	0.004	3.681	0.005	4.690	0.006
20.8	20 : 48	0.962	0.001	2.367	0.003	2.877	0.004	3.272	0.004	3.685	0.005	4.696	0.006
20.9	20 : 54	0.964	0.001	2.370	0.003	2.881	0.004	3.276	0.004	3.690	0.005	4.702	0.006
21	21 : 00	0.965	0.001	2.373	0.003	2.885	0.004	3.280	0.004	3.695	0.005	4.708	0.006
21.1	21 : 06	0.966	0.001	2.376	0.003	2.888	0.004	3.284	0.004	3.700	0.005	4.714	0.006
21.2	21 : 12	0.967	0.001	2.379	0.003	2.892	0.004	3.289	0.004	3.705	0.005	4.720	0.006
21.3	21 : 18	0.968	0.001	2.382	0.003	2.896	0.004	3.293	0.004	3.709	0.005	4.726	0.006
21.4	21 : 24	0.970	0.001	2.385	0.003	2.899	0.004	3.297	0.004	3.714	0.005	4.732	0.006
21.5	21 : 30	0.971	0.001	2.389	0.003	2.903	0.004	3.301	0.004	3.719	0.005	4.738	0.006
21.6	21 : 36	0.972	0.001	2.392	0.003	2.907	0.004	3.305	0.004	3.723	0.005	4.744	0.006
21.7	21 : 42	0.973	0.001	2.395	0.003	2.910	0.004	3.309	0.004	3.728	0.005	4.750	0.006
21.8	21 : 48	0.975	0.001	2.397	0.003	2.914	0.004	3.314	0.004	3.733	0.005	4.756	0.006
21.9	21 : 54	0.976	0.001	2.400	0.003	2.918	0.004	3.318	0.004	3.737	0.005	4.762	0.006
22	22 : 00	0.977	0.001	2.403	0.003	2.921	0.004	3.322	0.004	3.742	0.005	4.768	0.006
22.1	22 : 06	0.978	0.001	2.406	0.003	2.925	0.004	3.326	0.004	3.747	0.005	4.774	0.006
22.2	22 : 12	0.979	0.001	2.409	0.003	2.928	0.004	3.330	0.004	3.751	0.005	4.779	0.006
22.3	22 : 18	0.981	0.001	2.412	0.003	2.932	0.004	3.334	0.004	3.756	0.005	4.785	0.006
22.4	22 : 24	0.982	0.001	2.415	0.003	2.935	0.004	3.338	0.004	3.760	0.005	4.791	0.006
22.5	22 : 30	0.983	0.001	2.418	0.003	2.939	0.004	3.342	0.004	3.765	0.005	4.797	0.006
22.6	22 : 36	0.984	0.001	2.421	0.003	2.942	0.003	3.346	0.004	3.769	0.004	4.802	0.006
22.7	22 : 42	0.985	0.001	2.424	0.003	2.946	0.003	3.350	0.004	3.774	0.004	4.808	0.006
22.8	22 : 48	0.986	0.001	2.427	0.003	2.949	0.003	3.354	0.004	3.778	0.004	4.814	0.006
22.9	22 : 54	0.988	0.001	2.429	0.003	2.953	0.003	3.358	0.004	3.783	0.004	4.819	0.006
23	23 : 00	0.989	0.001	2.432	0.003	2.956	0.003	3.362	0.004	3.787	0.004	4.825	0.006
23.1	23 : 06	0.990	0.001	2.435	0.003	2.960	0.003	3.366	0.004	3.791	0.004	4.831	0.006
23.2	23 : 12	0.991	0.001	2.438	0.003	2.963	0.003	3.370	0.004	3.796	0.004	4.836	0.006
23.3	23 : 18	0.992	0.001	2.441	0.003	2.967	0.003	3.373	0.004	3.800	0.004	4.842	0.006
23.4	23 : 24	0.993	0.001	2.444	0.003	2.970	0.003	3.377	0.004	3.804	0.004	4.847	0.006
23.5	23 : 30	0.994	0.001	2.446	0.003	2.973	0.003	3.381	0.004	3.809	0.004	4.853	0.006
23.6	23 : 36	0.996	0.001	2.449	0.003	2.977	0.003	3.385	0.004	3.813	0.004	4.858	0.005
23.7	23 : 42	0.997	0.001	2.452	0.003	2.980	0.003	3.389	0.004	3.817	0.004	4.864	0.005
23.8	23 : 48	0.998	0.001	2.455	0.003	2.983	0.003	3.392	0.004	3.822	0.004	4.869	0.005
23.9	23 : 54	0.999	0.001	2.457	0.003	2.987	0.003	3.396	0.004	3.826	0.004	4.875	0.005
24	24 : 00	1.000	0.001	2.460	0.003	2.990	0.003	3.400	0.004	3.830	0.004	4.880	0.005

Appendix B – Existing Conditions Input Data

HEC-RAS Input Data

Existing Basin Calculations			
Variable	Value	Units	Comments
Cw 2/10 Year	0.16	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
Cw 25 Year	0.18	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
Cw 100 Year	0.20	N/A	Weighted Runoff Coefficeint found by using equation 2 in the Report
A1	150.31	Acres	Total Area for this land cover within the sub-basin
C1 - 2/10 Year	0.15	Agricultural	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 25 Year	0.17	Agricultural	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 100 Year	0.19	Agricultural	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
A2	5.84	Acres	Total Area for this land cover within the sub-basin
C1 - 2/10 Year	0.45	Developed, Low Intensity	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 25 Year	0.50	Developed, Low Intensity	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 100 Year	0.57	Developed, Low Intensity	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
A3	0.07	Acres	Total Area for this land cover within the sub-basin
C1 - 2/10 Year	0.38	Developed, Open Space	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 25 Year	0.41	Developed, Open Space	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
C1 - 100 Year	0.47	Developed, Open Space	Average for the runoff Coefficeints of the storm event of the land cover found in Table 2-1
Tc	0.33	Hours	Time of Concentration found by using equation 3 in the Report
L	0.24	Miles	Length of longest flow path within the sub-basin
Kb	0.06	N/A	Watershed Resistance Coefficent found by using equation 4 in the report
m	-0.01375	N/A	Type B watershed Resistance Coefficients found in table 2-2
b	0.08	N/A	Type B watershed Resistance Coefficients found in table 2-2
S	26.4	ft/mi	Slope of the longest flow path within the sub-basin
i	5.96	N/A	Localized IDF value found in Table 2-7
Q 2/10 Year	150.19	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report
Q 25 Year	165.21	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report
Q 100 Year	190.06	CFS	Peak Flow of the 100-yr Storm Event found by using equation 1 in the report

Appendix C – Proposed Conditions Input Data

HEC-RAS Input Data

		CN	CN Adjusted	Abstraction Ratio	Min Infill Rate	Mannings N	% Impervious
0	NoData	92			0.05	0.05	0
1	NoData : C	90			0.05	0.05	0
10	Developed, Medium Intensity : NoData	86			0.05	0.3	80
11	Developed, Medium Intensity : C	81			0.05	0.3	80
12	Developed, Medium Intensity : B	72			0.05	0.3	80
13	Developed, Medium Intensity : A	57			0.05	0.3	80
14	Developed, Medium Intensity : D	86			0.05	0.3	80
15	Shrub-Scrub : NoData	77			0.05	0.06	0
16	Shrub-Scrub : C	70			0.05	0.06	0
17	Shrub-Scrub : B	56			0.05	0.06	0
18	Shrub-Scrub : A	35			0.05	0.06	0
19	Shrub-Scrub : D	77			0.05	0.06	0
2	NoData : B	85			0.05	0.05	0
20	Cultivated Crops : NoData	89			0.05	0.035	0
21	Cultivated Crops : C	85			0.05	0.035	0
22	Cultivated Crops : B	78			0.05	0.035	0
23	Cultivated Crops : A	67			0.05	0.035	0
24	Cultivated Crops : D	89			0.05	0.035	0
25	Woody Wetlands : NoData	86			0.05	0.04	0
26	Woody Wetlands : C	82			0.05	0.04	0
27	Woody Wetlands : B	73			0.05	0.04	0
28	Woody Wetlands : A	57			0.05	0.04	0
29	Woody Wetlands : D	86			0.05	0.04	0
3	NoData : A	76			0.05	0.05	0
30	Emergent Herbaceous Wetlands : NoData	93			0.05	0.04	0
31	Emergent Herbaceous Wetlands : C	87			0.05	0.04	0
32	Emergent Herbaceous Wetlands : B	80			0.05	0.04	0
33	Emergent Herbaceous Wetlands : A	70			0.05	0.04	0
34	Emergent Herbaceous Wetlands : D	93			0.05	0.04	0
35	Developed, Open Space : NoData	84			0.05	0.035	25
36	Developed, Open Space : C	79			0.05	0.035	25
37	Developed, Open Space : B	69			0.05	0.035	25
38	Developed, Open Space : A	49			0.05	0.035	25
39	Developed, Open Space : D	84			0.05	0.035	25
4	NoData : D	91			0.05	0.05	0
40	Developed, Low Intensity : NoData	84			0.05	0.035	25
41	Developed, Low Intensity : C	79			0.05	0.035	25
42	Developed, Low Intensity : B	68			0.05	0.035	25
43	Developed, Low Intensity : A	51			0.05	0.035	25
44	Developed, Low Intensity : D	84			0.05	0.035	25
45	Pasture, Hay : NoData	80			0.05	0.05	0
46	Pasture, Hay : C	74			0.05	0.05	0
47	Pasture, Hay : B	61			0.05	0.05	0
48	Pasture, Hay : A	39			0.05	0.05	0
49	Pasture, Hay : D	80			0.05	0.05	0
5	Developed, High Intensity : NoData	92			0.05	0.5	90
50	Grassland, Herbaceous : NoData	89			0.05	0.04	0
51	Grassland, Herbaceous : C	81			0.05	0.04	0
52	Grassland, Herbaceous : B	71			0.05	0.04	0
53	Grassland, Herbaceous : A	63			0.05	0.04	0
54	Grassland, Herbaceous : D	89			0.05	0.04	0
55	Barren Land : NoData	92			0.05	0.05	0
56	Barren Land : C	90			0.05	0.05	0
57	Barren Land : B	85			0.05	0.05	0
58	Barren Land : A	76			0.05	0.05	0
59	Barren Land : D	92			0.05	0.05	0
6	Developed, High Intensity : C	90			0.05	0.5	90
60	Open Water : NoData	100			0.05	0.015	100
61	Open Water : C	100			0.05	0.015	100
62	Open Water : B	100			0.05	0.015	100
63	Open Water : A	100			0.05	0.015	100
64	Open Water : D	100			0.05	0.015	100
7	Developed, High Intensity : B	85			0.05	0.5	90
8	Developed, High Intensity : A	77			0.05	0.5	90
9	Developed, High Intensity : D	92			0.05	0.5	90
	Proposed Roads : NoData	94			0.05	0.02	90
	Proposed Roads : A	91			0.05	0.02	90
	Proposed Roads : B	92			0.05	0.02	90
	Proposed Roads : C	93			0.05	0.02	90
	Proposed Roads : D	94			0.05	0.02	90

Appendix D – Existing Condition Exhibit Maps

Overall Basin Map

Max. Water Depth

Max. Water Velocity

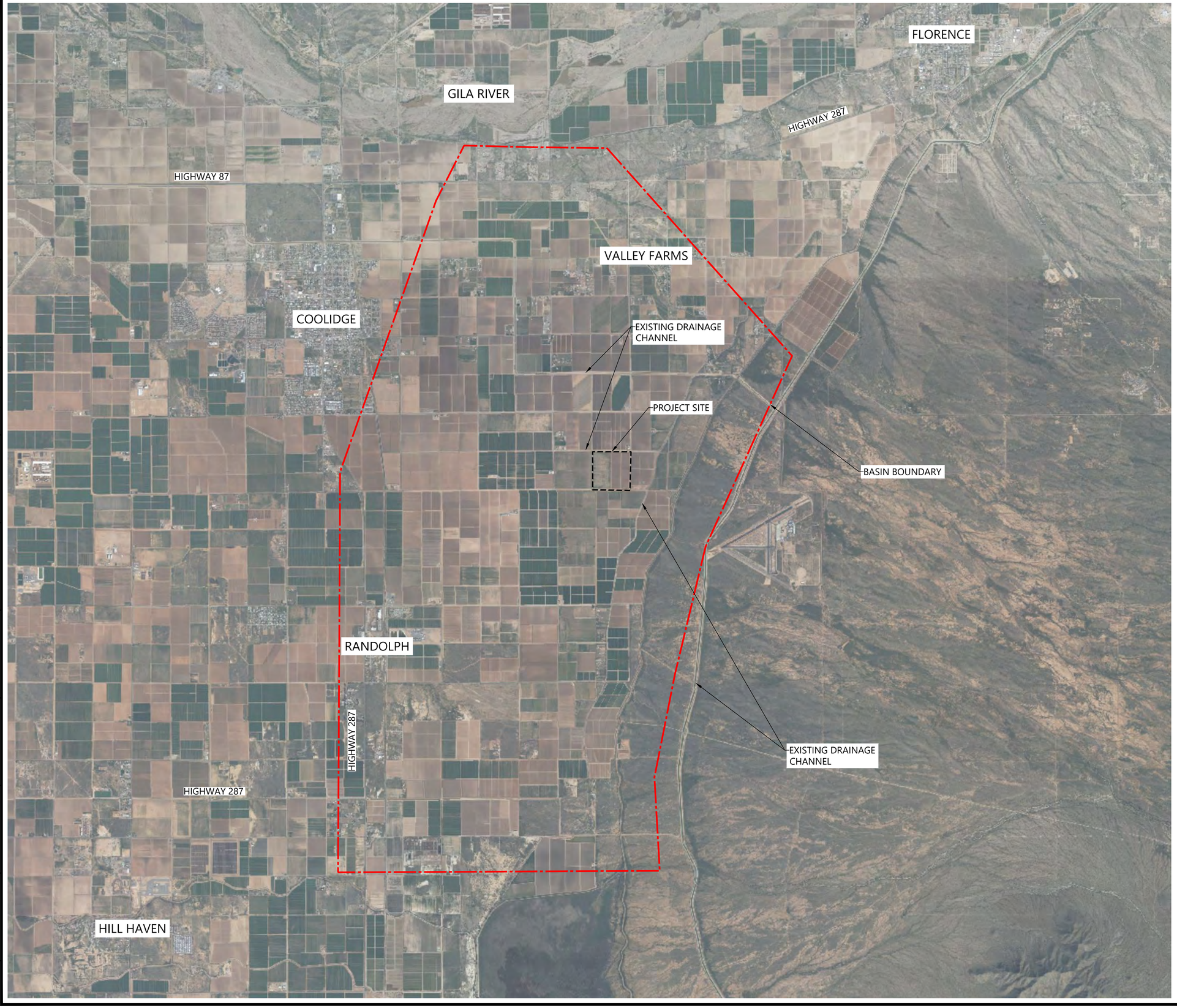
Max. Potential Scour

Subbasin Map

Soils Map

Land Cover Map

Curve Number Map



3000 0 3000 6000

(IN FEET)
1 inch = 3000 ft.

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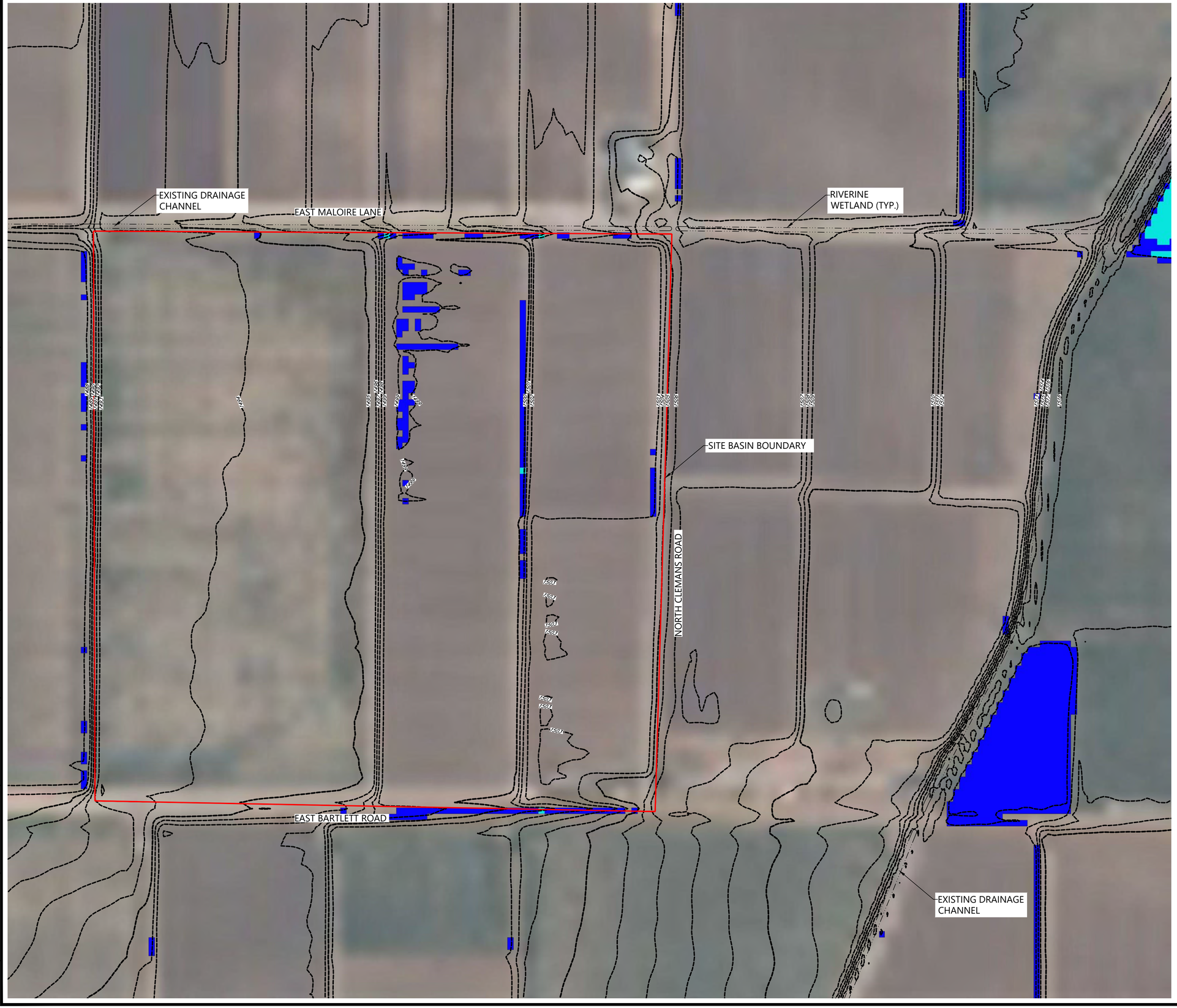
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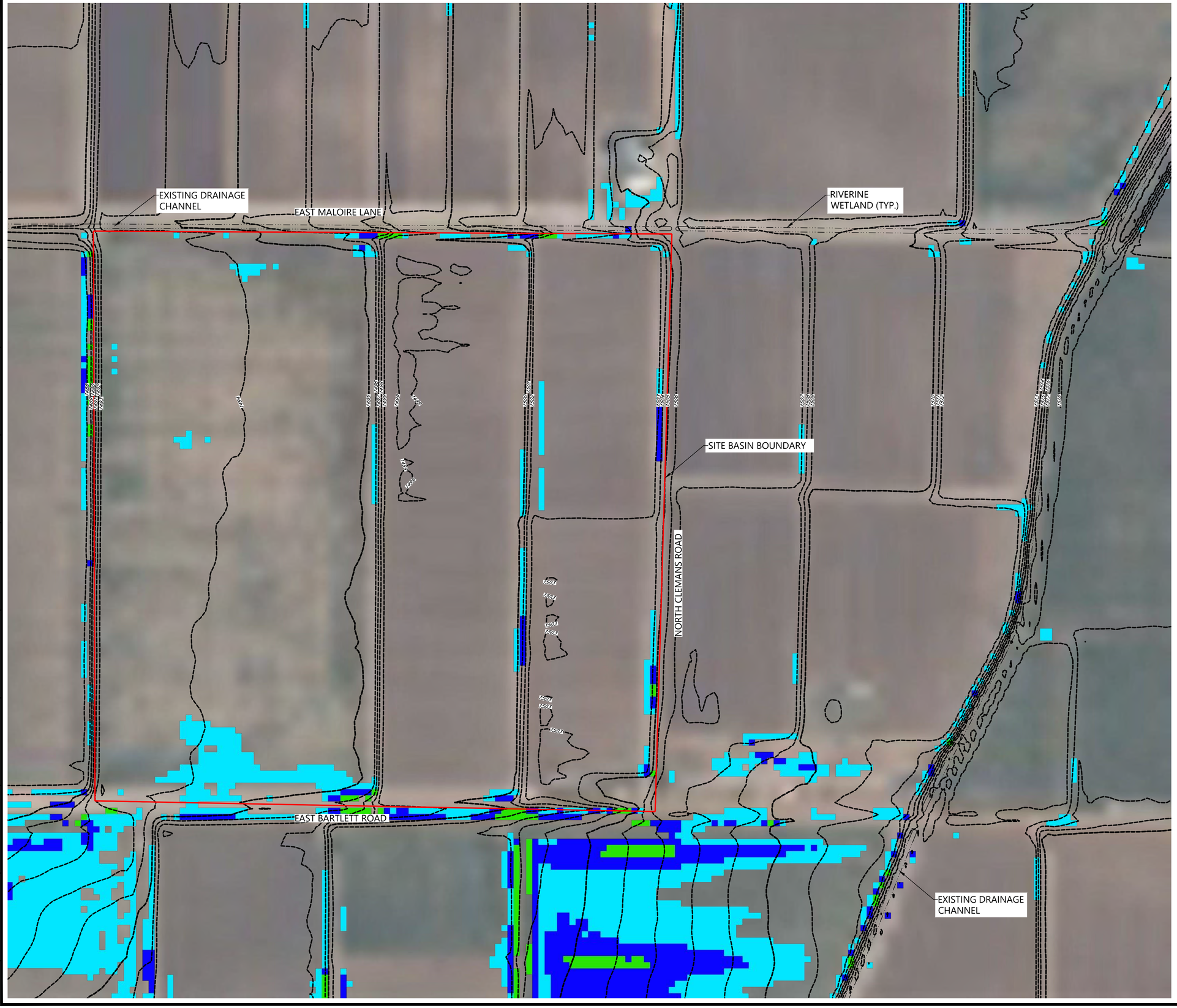
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200 0 200 400

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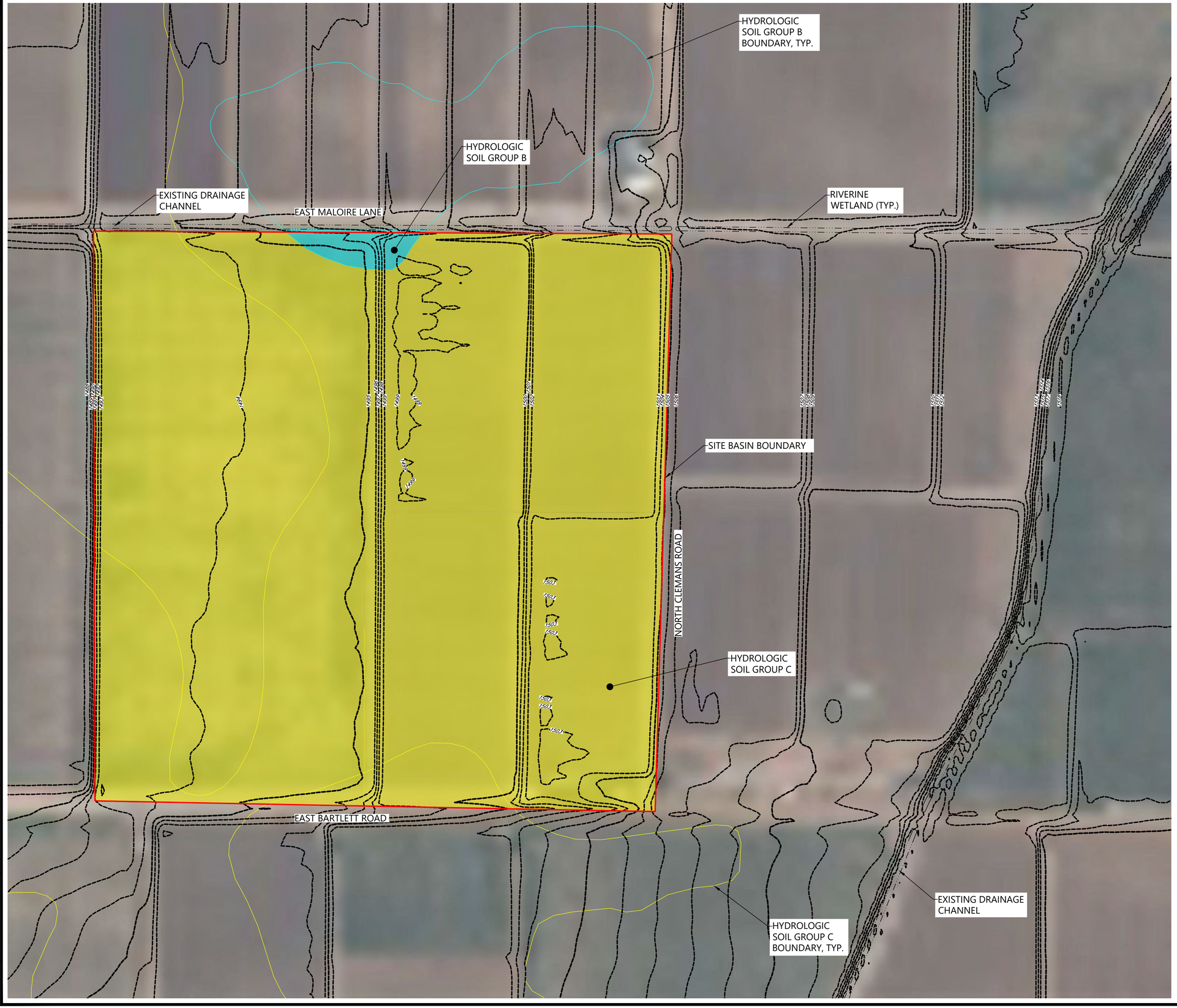
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- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C

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(IN FEET)
1 inch = 200 ft.

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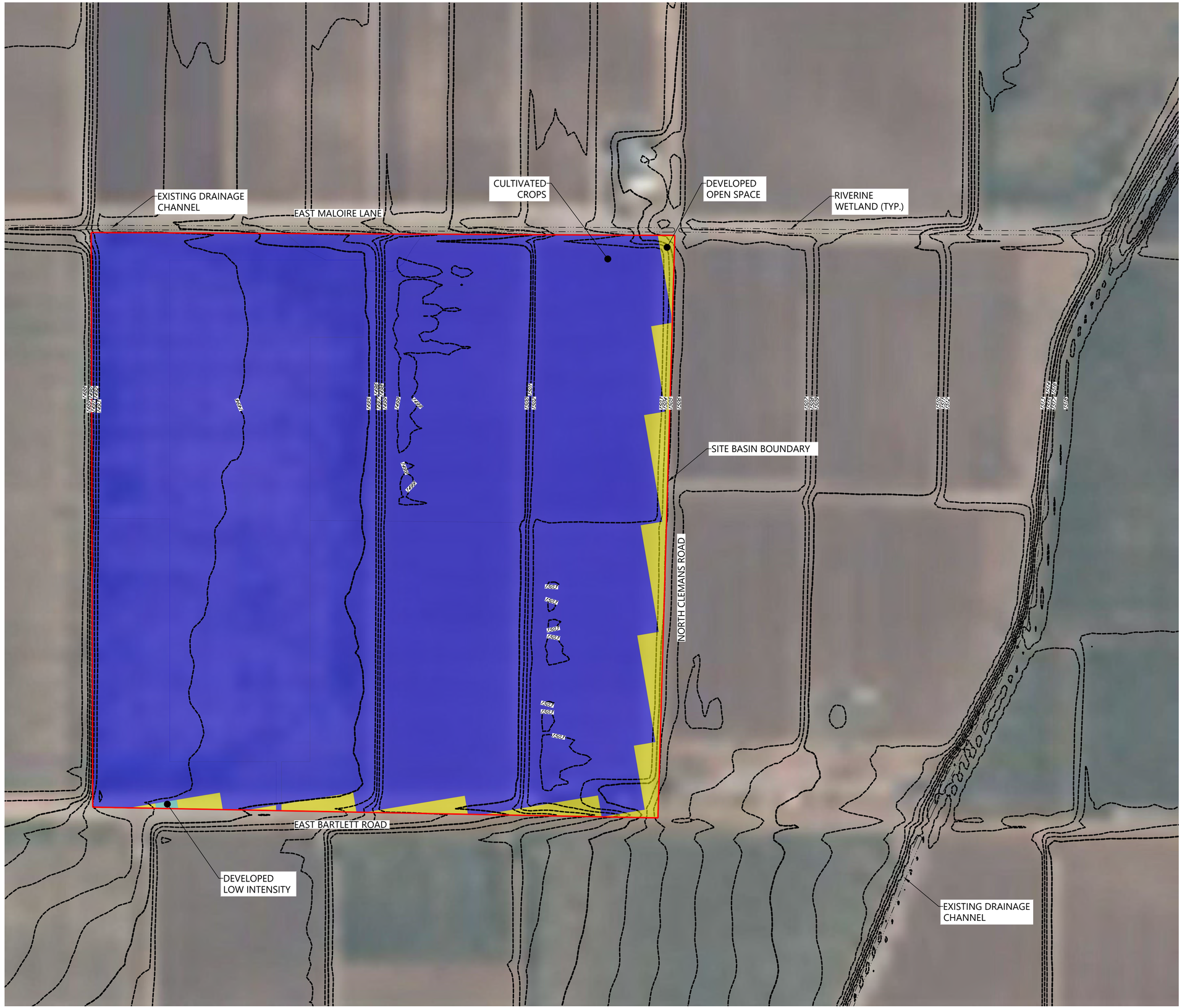
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LEGEND:

- BASIN - CULTIVATED CROPS
- BASIN - DEVELOPED OPEN SPACE
- BASIN - DEVELOPED LOW INTENSITY

200 0 200 400

(IN FEET)
1 inch = 200 ft.

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VALLEY FARMS BESS
HYDROLOGY PLAN EXHIBITS
EXISTING LAND COVER MAP

CLIENT
NEXTERA ENERGY
700 UNIVERSE BLVD
JUNO BEACH, FL 33408
PHONE: 847.736.6805

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Appendix E – Proposed Condition Exhibit Maps

Max. Water Depth

Max. Water Velocity

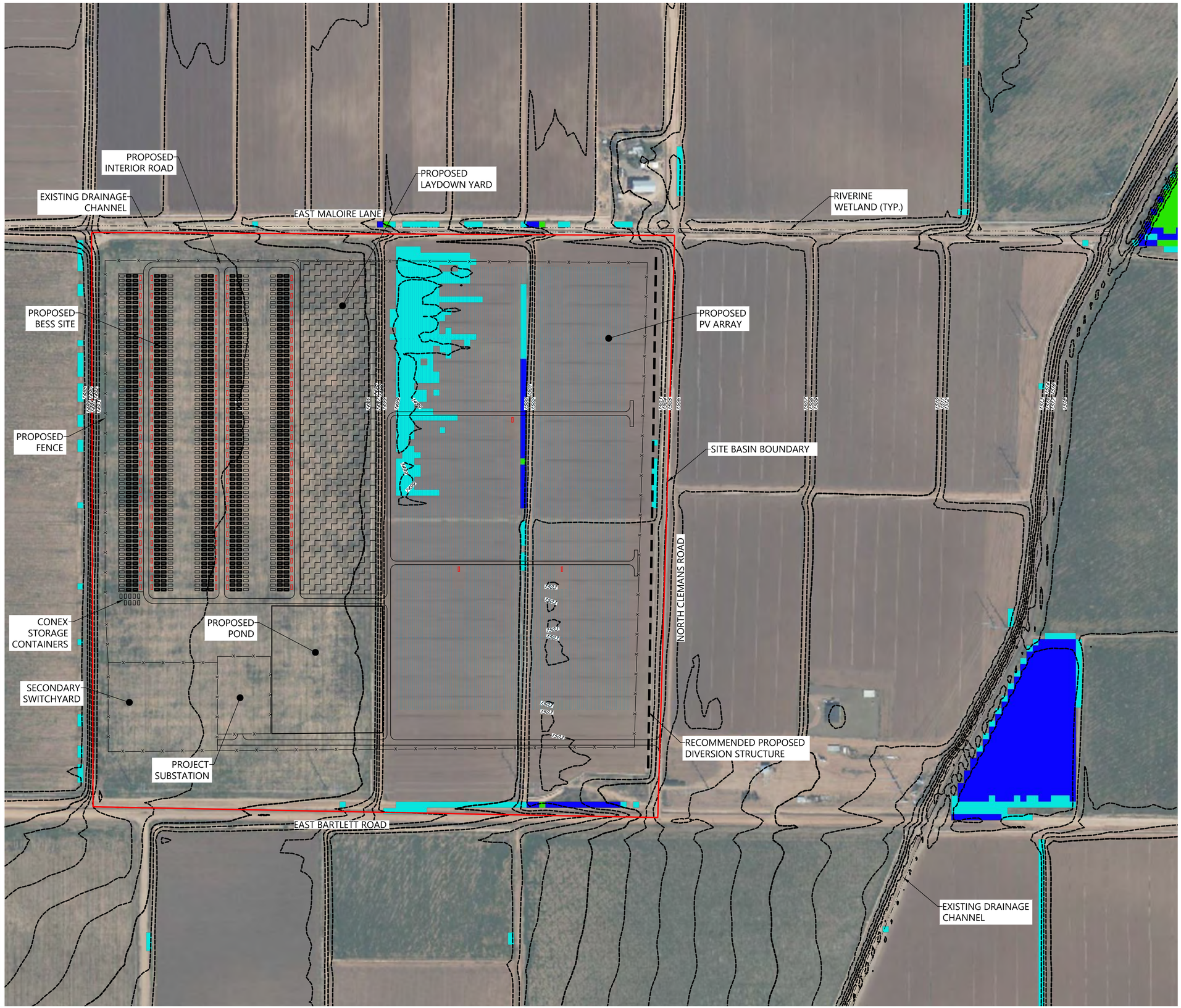
Max. Potential Scour

Subbasin Map

Soils Map

Land Cover Map

Curve Number Map



MAXIMUM DEPTH
100-YR EVENT, FT

- <=0.5
- 0.5 to 0.75
- 0.75 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- >4.0

200 0 200 400

(IN FEET)
1 inch = 200 ft.

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PROPOSED 100-YR DEPTH

CLIENT
NEXTERA ENERGY
700 UNIVERSE BLVD
JUNO BEACH, FL 33408
PHONE: 847.736.6805

DATE 09/30/2024

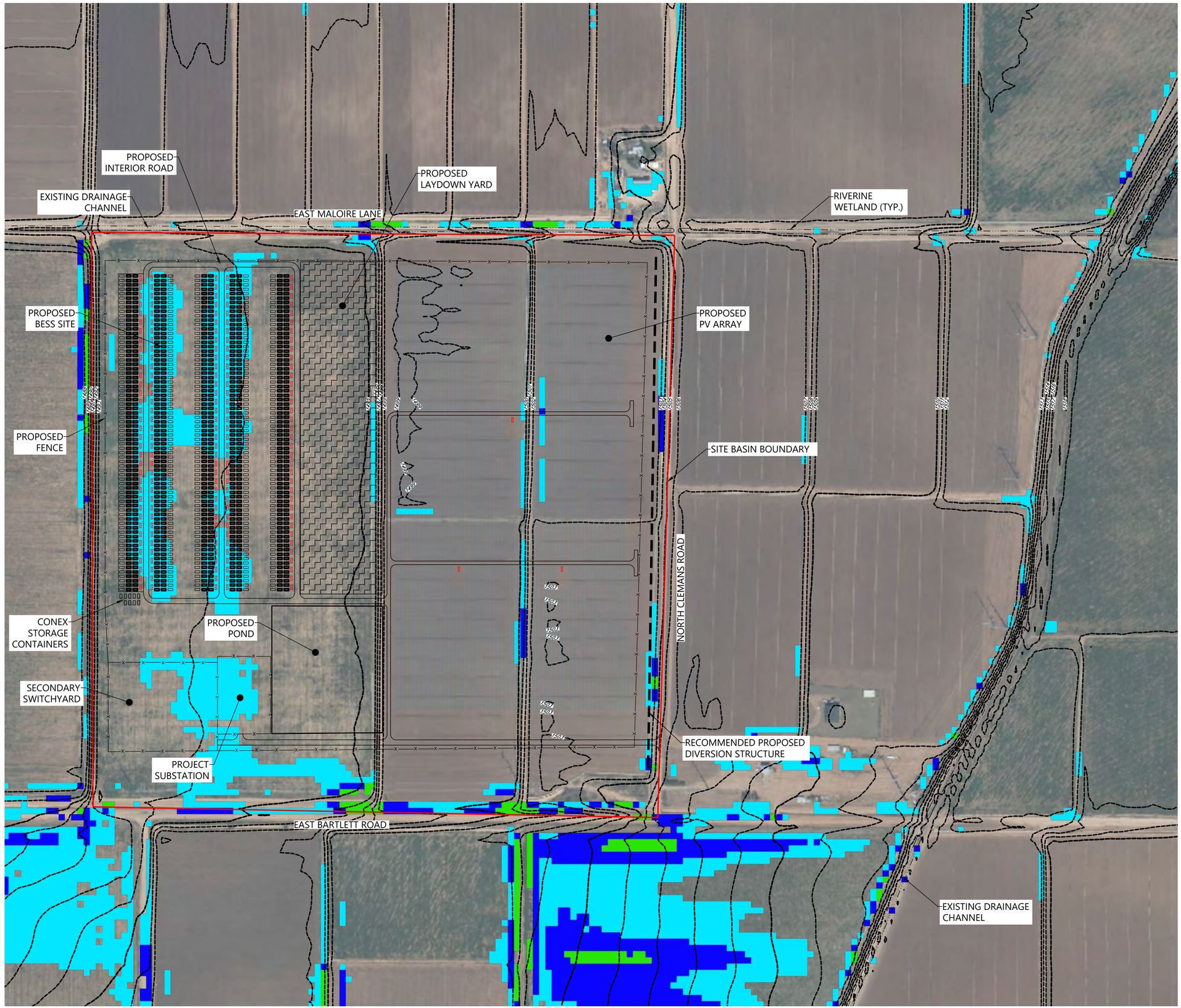
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MAXIMUM VELOCITY
100-YR EVENT, FPS

- <=0.5
- 0.5 to 0.75
- 0.75 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- >4.0

200 0 200 400
(IN FEET)
1 inch = 200 ft.

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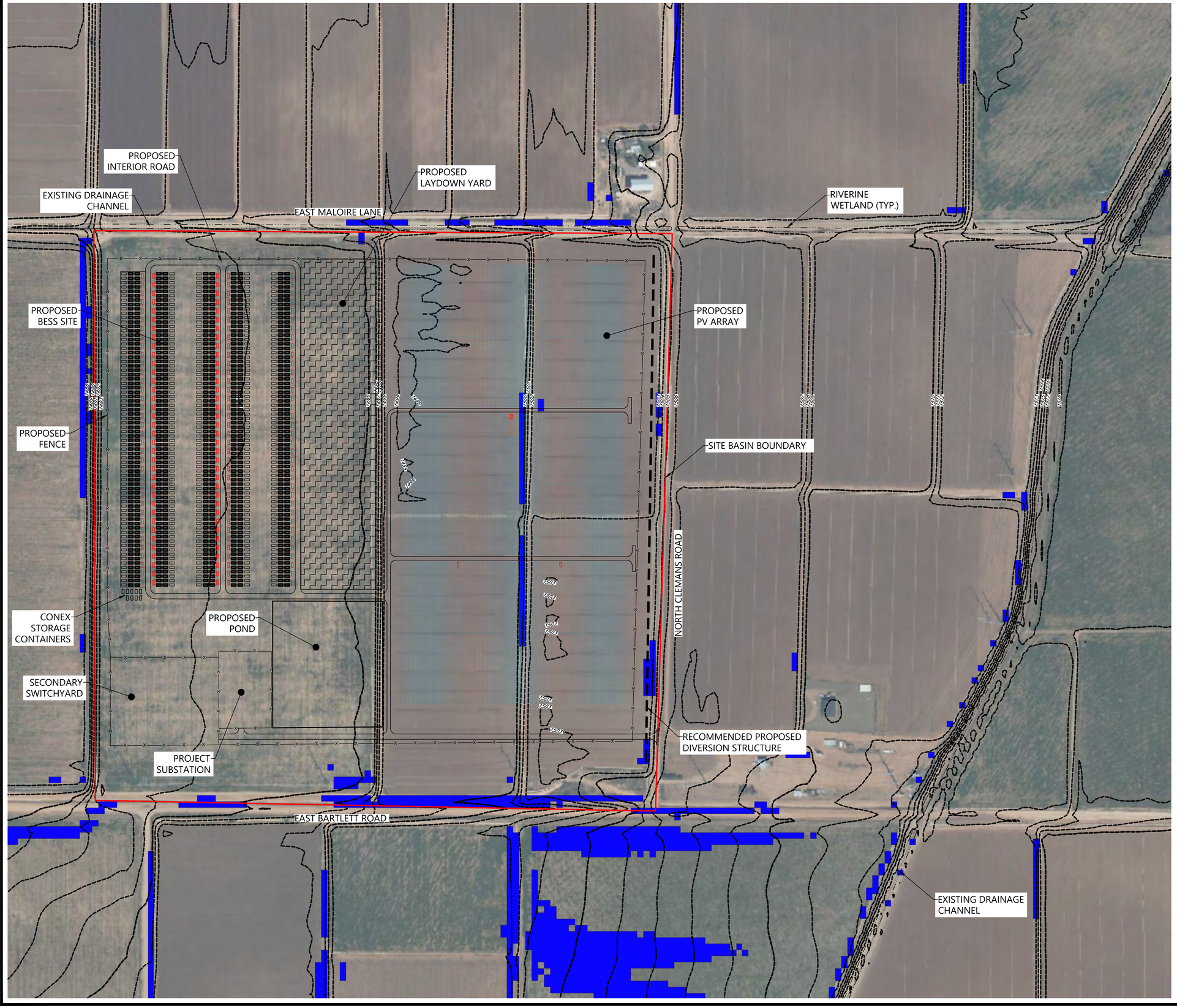
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MAXIMUM SCOUR
100-YR EVENT, FT

- <=0.5
- 0.5 to 1.0
- 1.0 to 2.0
- 2.0 to 4.0
- 4.0 to 8.0
- >8.0

200 0 200 400

(IN FEET)
1 inch = 200 ft.

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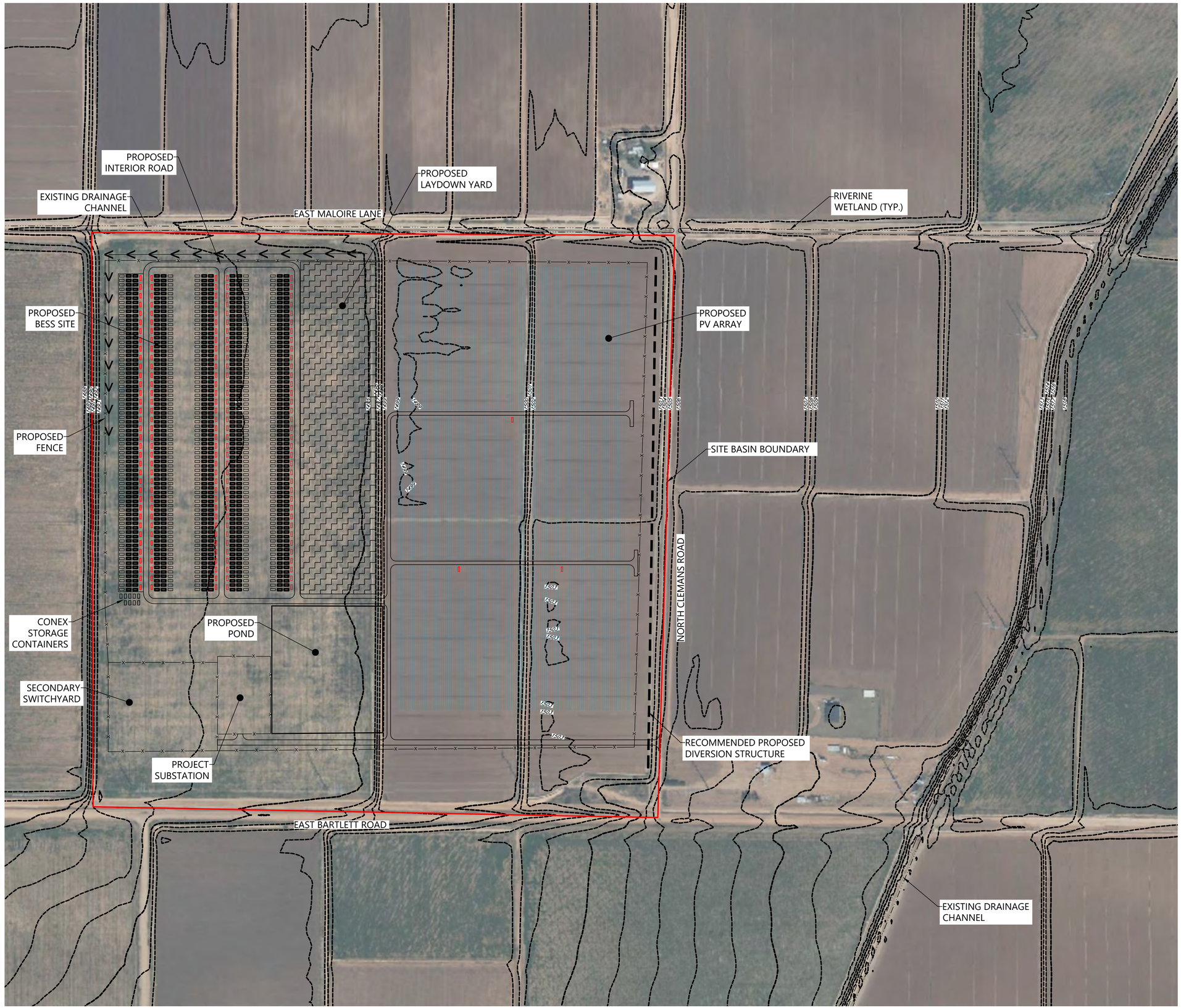
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PROPOSED BASIN MAP

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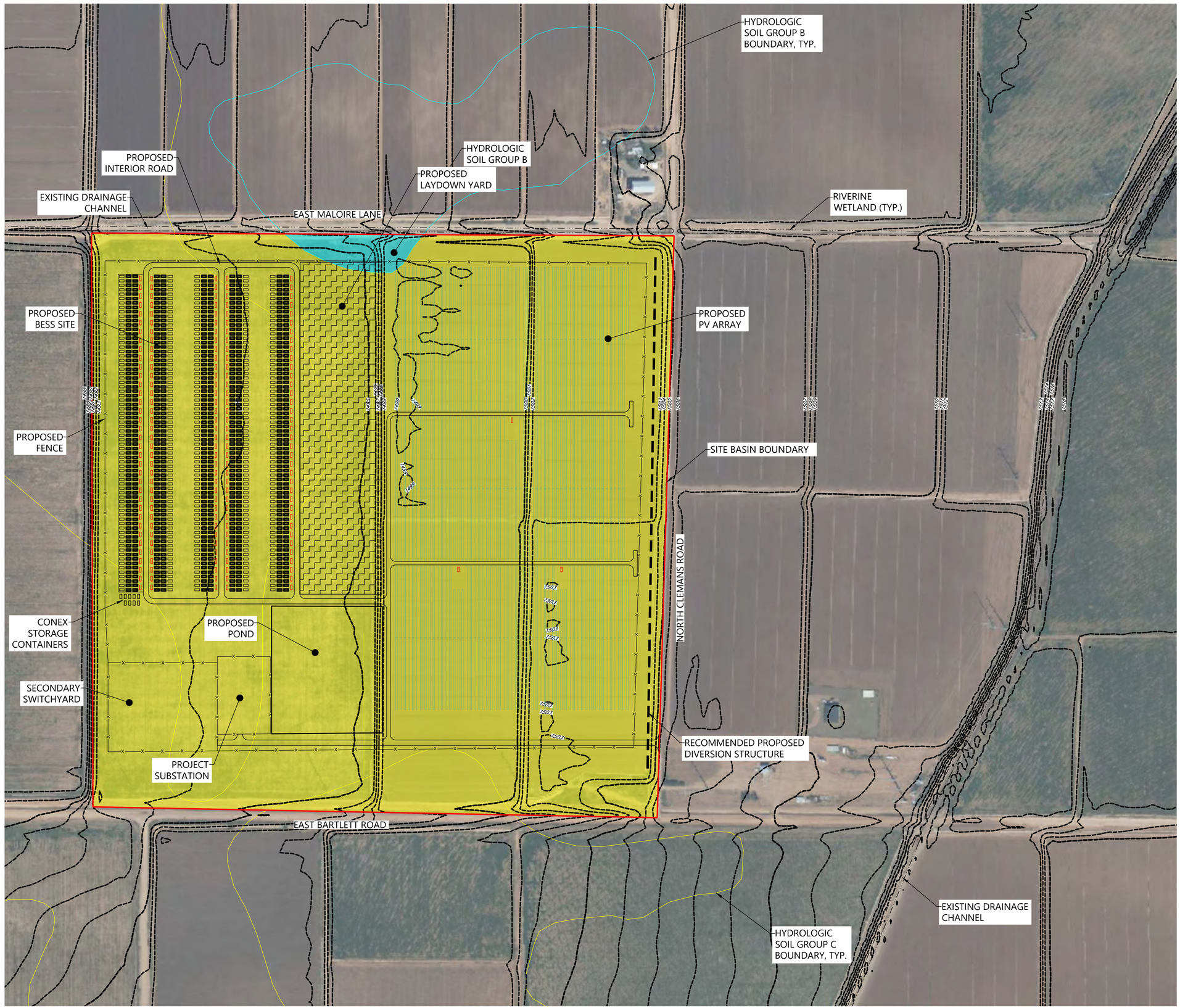
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LEGEND:

- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C

200 0 200 400

(IN FEET)
1 inch = 200 ft.

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PROPOSED SOILS MAP

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LEGEND:

- BASIN - CULTIVATED CROPS
- BASIN - DEVELOPED OPEN SPACE
- BASIN - DEVELOPED LOW INTENSITY
- BASIN - PROPOSED SITE

200 0 200 400

(IN FEET)
1 inch = 200 ft.

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PROPOSED CURVE NUMBER MAP

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VALLEY FARMS ENERGY CENTER PROJECT

Earth Fissure

Project Area

Fissure Line

Reported

Existing Infrastructure

230 kV Transmission Line

500 kV Transmission Line

Coolidge Municipal Airport

Pinal County, AZ
USGS 7.5' Quadrangle:
Valley Farms, AZ, 32111-H4
T5S R9E Sec 31
NAD 1983 UTM Zone 12N
111.4597°W 32.9482°N

0 2,000 4,000 Feet
0 590 1,180 Meters

1:55,000

N

SWCA ENVIRONMENTAL CONSULTANTS

Base Map: ESRI ArcGIS Online, accessed July 2024

Updated: 7/25/2024
Project No. 64841
File:64841 Project Earth Fissure

PRELIMINARY POTABLE WATER REPORT

VALLEY FARMS ENERGY CENTER
PINAL COUNTY, ARIZONA

Prepared for
save
NextEra Energy
700 Universe Blvd
Juno Beach, FL 33408

Atwell Project No. 24000083



Expires 3/31/2027

Submitted by Atwell, LLC

REVISION NO:	DATE:	REVISION:	PROJECT MANAGER APPROVAL (INITIAL & DATE)	CLIENT APPROVAL (INITIAL & DATE)
0	09/27/2024	Final Report	DM – 09/27/2024	

Table of Contents

1 Project Description 1
2 Location 1
3. Purpose of Report 1
4. Design Requirements 2
5. Existing Potable Water Infrastructure 2
6. Proposed Potable Water Infrastructure 2
References 2

Appendices

Appendix A – Site Plan

1 Project Description

Valley Farms Energy Center, LLC (Applicant), a wholly owned indirect subsidiary of NextEra Energy Resources, is requesting a Zone Change and Planned Area Development (PAD) Overlay District to construct, operate, and maintain the Valley Farms Energy Center Project, a utility-scale photovoltaic (PV) solar facility and battery energy storage system (BESS) on approximately 160 acres of private land in unincorporated Pinal County, Arizona.

The proposed construction consists of a PV solar facility and a battery energy storage system and will include a substation and associated electrical equipment mounted on mat foundations.

Proposed earthwork will consist of typical clearing and grubbing of vegetation and grading with associated cuts and fills necessary for equipment installation. Dirt or gravel access and maintenance roads will be constructed to access the site and substation. Natural drainage patterns will be maintained through and around the site.

2 Location

The project is located in central Pinal County in southern Arizona, approximately 4.30 miles southeast of Coolidge, Arizona. The west edge of the project is approximately 2600’ east of North Attaway Road. The north edge of the project is bounded by East Malorie Lane. The east edge of the project is bounded by North Clemans Road. The south edge of the project is bounded by East Bartlett Road. The site is part of the Middle Gila watershed.



Figure 1: Project Location

3. Purpose of Report

The purpose of this report is to identify existing and proposed potable water infrastructure within the proposed project site.

4. Design Requirements

Chapter 9 of the Pinal County, Arizona Subdivision and Infrastructure Design Manual provide design criteria and guidance for construction of potable water systems within Pinal County. Water systems within Arizona must also meet the requirements of the Arizona Department of Environmental Quality.

5. Existing Potable Water Infrastructure

The project is located in a rural area. Existing potable water facilities in the region would be specific to homes and would likely consist of well systems. An existing home is located adjacent to the northeast corner of the site, across East Maloire Lane.

Existing potable water infrastructure within the site has not been identified or analyzed. It is not anticipated that any such facilities exist within the project area.

If any potable water infrastructure is identified on site, appropriate measures should be taken to ensure that they are not disturbed or damaged during construction activities.

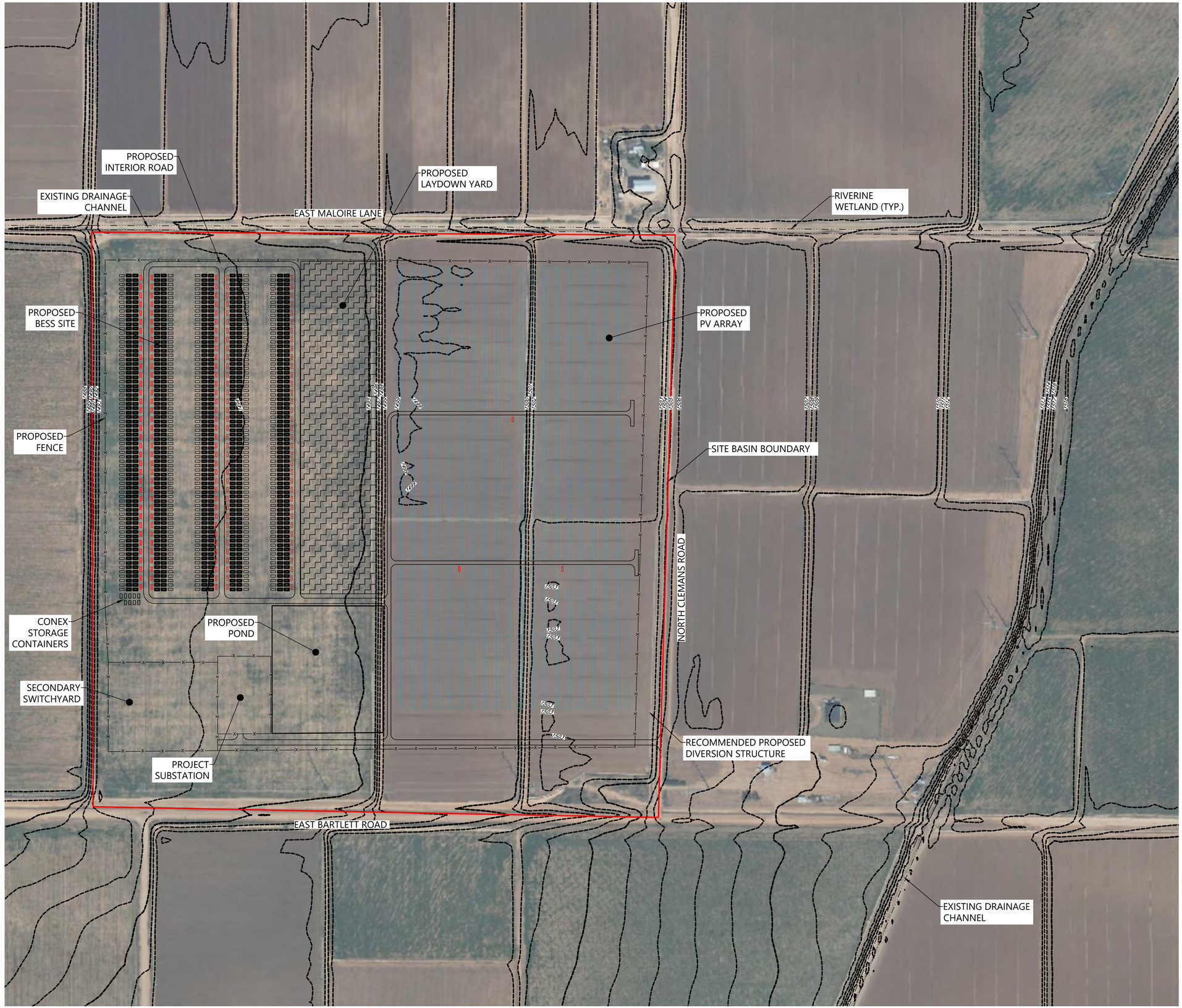
6. Proposed Potable Water Infrastructure

New potable water infrastructure is not proposed for this project. The proposed project is an energy utility facility which will not require a water supply.

References

1. *Pinal County Subdivision & Infrastructure Design Manual*, August 2004

Appendix A - Site Plan



200 0 200 400

(IN FEET)
1 inch = 200 ft.

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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311 N. ARMENIA STREET
TAMPA, FL 33609
734.994.4000

VALLEY FARMS BESS
HYDROLOGY PLAN EXHIBITS
PROPOSED SITE MAP

CLIENT
NEXTERA ENERGY
700 UNIVERSE BLVD
JUNO BEACH, FL 33408
PHONE: 847.736.6805

DATE 09/27/2024

REVISIONS

DR. AE | CH. SP
P.M. SP
BOOK
JOB 24000083
SHEET NO. 1

NOT-ISSUED-FOR-CONSTRUCTION

CAD FILE: VALLEY FARMS BESS_SITE MAP.DWG

FILE NAME: E:\00 PROJECTS\24000083.1\5 Design\3.4 Civil Design\3.4.9 Hydrology Study\00S-Exhibits\Exhibit 2\VALLEY FARMS BESS_SITE MAP.dwg LAST SAVED BY: ateena 9/27/2024 12:27 PM PLOTTED BY: Kevin Evora 9/27/2024 PAPER: ARCH FULL BLEED D (24.00 X 36.00 INCHES) DEVICE: DWG TO PDF.PC3 PLOT STYLE: COLOR.CTB

PRELIMINARY WASTEWATER REPORT

VALLEY FARMS ENERGY CENTER
PINAL COUNTY, ARIZONA

Prepared for
save
NextEra Energy
700 Universe Blvd
Juno Beach, FL 33408

Atwell Project No. 24000083



Expires 3/31/2027

Submitted by Atwell, LLC

REVISION NO:	DATE:	REVISION:	PROJECT MANAGER APPROVAL (INITIAL & DATE)	CLIENT APPROVAL (INITIAL & DATE)
	09/06/2024	Final Report		

Table of Contents

1 Project Description 1
2 Location 1
3. Purpose of Report 1
4. Design Requirements 1
5. Existing Wastewater Infrastructure 2
6. Proposed Wastewater Infrastructure 2
References 2

Appendices

Appendix A – Site Plan

1 Project Description

Valley Farms Energy Center, LLC (Applicant), a wholly owned indirect subsidiary of NextEra Energy Resources, is requesting a Zone Change and Planned Area Development (PAD) Overlay District to construct, operate, and maintain the Valley Farms Energy Center Project, a utility-scale photovoltaic (PV) solar facility and battery energy storage system (BESS) on approximately 160 acres of private land in unincorporated Pinal County, Arizona.

The proposed construction consists of a PV solar facility and a battery energy storage system and will include a substation and associated electrical equipment mounted on mat foundations.

Proposed earthwork will consist of typical clearing and grubbing of vegetation and grading with associated cuts and fills necessary for equipment installation. Dirt or gravel access and maintenance roads will be constructed to access the site and substation. Natural drainage patterns will be maintained through and around the site.

2 Location

The project is located in central Pinal County in southern Arizona, approximately 4.30 miles southeast of Coolidge, Arizona. The west edge of the project is approximately 2600’ east of North Attaway Road. The north edge of the project is bounded by East Malorie Lane. The east edge of the project is bounded by North Clemans Road. The south edge of the project is bounded by East Bartlett Road. The site is part of the Middle Gila watershed.



Figure 1: Project Location

3. Purpose of Report

The purpose of this report is to identify existing and proposed wastewater infrastructure within the proposed project site.

4. Design Requirements

Chapter 10 of the Pinal County, Arizona Subdivision and Infrastructure Design Manual provide design criteria and guidance for construction of sewer systems within Pinal County. Sewer systems within Arizona must also

meet the requirements of the Arizona Administration Code Title, 18, Chapter 9, Articles 2 and 3 provided by the Arizona Department of Environmental Quality.

5. Existing Wastewater Infrastructure

The project is located in a rural area. Existing wastewater facilities in the region would be specific to homes and would likely consist of septic systems. An existing home is located adjacent to the northeast corner of the site, across East Maloire Lane.

Existing wastewater infrastructure within the site has not been identified or analyzed. It is not anticipated that any wastewater facilities exist within the project area.

If any wastewater infrastructure is identified on site, appropriate measures should be taken to ensure that they are not disturbed or damaged during construction activities.

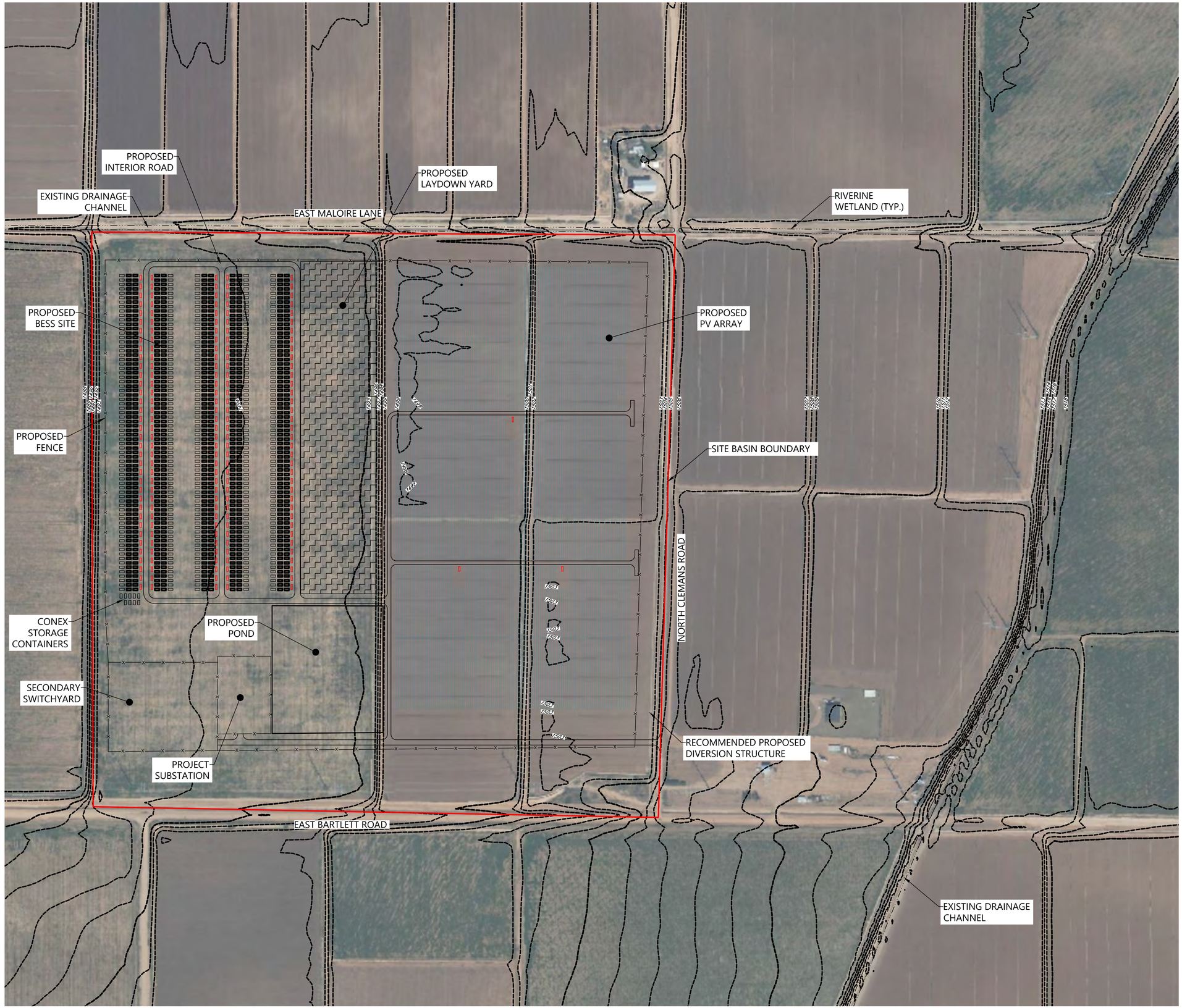
6. Proposed Wastewater Infrastructure

New wastewater infrastructure is not proposed for this project. The proposed project is an energy utility facility which will not include restrooms or other permanent facilities which would produce wastewater.

References

1. *Pinal County Subdivision & Infrastructure Design Manual*, August 2004

Appendix A - Site Plan



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Pinal Central Dispatch

AFFIDAVIT OF PUBLICATION

State of Florida, County of Broward, ss:

Rachel Cozart, being first duly sworn, deposes and says: That (s)he is a duly authorized signatory of Column Software, PBC, duly authorized agent of Pinal Central Dispatch, a newspaper published at Casa Grande, Pinal County, Arizona,Thursday of each week; that a notice, a full, true and complete printed copy of which is hereunto attached, was printed in the regular edition of said newspaper, and not in a supplement thereto, for 1 issues. The publications thereof having been on the following dates:

PUBLICATION DATES:
Jan. 30, 2025

NOTICE ID: EZHEn99T1Py5BtbveDFB
NOTICE NAME: PZ-017-24

Rachel Cozart
(Signed)_____

SHERI SMITH
Notary Public - State of Florida
Commission # HH269383
Expires on May 31, 2026

VERIFICATION

State of Florida
County of Broward

Subscribed in my presence and sworn to before me on this: 01/31/2025

S Smith
_____
Notary Public
Notarized remotely online using communication technology via Proof.

NOTICE OF PUBLIC HEARING BY THE PINAL COUNTY PLANNING AND ZONING COMMISSION AT 9:00 A.M. ON THE 20th DAY OF FEBUARY, 2025, IN THE PINAL COUNTY EMERGENCY OPERATIONS CENTER, 85 N. FLORENCE STREET, FLORENCE, ARIZONA, TO CONSIDER THE APPLICATION FOR A REZONE AND A PLANNED AREA DEVELOPMENT IN AN UNINCORPORATED AREA OF PINAL COUNTY, ARIZONA
PZ-017-24 - PUBLIC HEARING/ ACTION: Gregory C. and Loralee Wuertz Family Trust owner, W. Ralph Pew, Pew & Lake PLC, applicant, requesting approval of a rezone from General Rural (GR) to Industrial Zoning (I-3) on approximately 160± acres to develop a photovoltaic solar energy production facility, situated in a portion of Section 31, T05S, R09E, G&SRB&M, tax parcels 202-35-0040, located in the Coolidge/Valley Farms area east of Highway 87, at the northwest corner of E Bartlett Rd and N Clemens Rd
PZ-PD-011-24 – PUBLIC HEARING/ACTION: Gregory C. and Loralee Wuertz Family Trust owner, W. Ralph Pew, Pew & Lake PCL, applicant, requesting approval of a 160± acres Planned Area Development (PAD) Overlay District consistent with case PZ-017-24 (160± acres); situated in a portion of Section 31, T05S, R09E, G&SRB&M, tax parcels 202-35-0040, located in the Coolidge/ Valley Farms area east of Highway 87, at the northwest corner of E Bartlett Rd and N Clemens Rd
At least 24 hours prior to the public hearing, documents pertaining to these requests are available for public inspection at the Pinal County Planning and Development Department, Pinal County Complex, 85 N. Florence Street, Florence, Arizona, Monday through Thursday between the hours of 7:30 a.m. and 5:30 p.m. and on the internet at: https://www.pinal.gov/236/Notice-of-Hearings
ALL PERSONS INTERESTED IN THESE MATTERS MAY APPEAR AT THE PUBLIC HEARING AT THE DATE, TIME AND PLACE DESIGNATED ABOVE AND STATE THEIR APPROVAL OR OBJECTION TO THE PROPOSED AMENDMENT.PROTESTS TO THE REZONING AND/OR PAD OVERLAY ZONE BY 20% OF THE PROPERTY OWNERS BY AREA AND NUMBER WITHIN 300 FEET OF THE PROPERTY PROPOSED FOR REZONING WILL REQUIRE AN AFFIRMATIVE VOTE OF THREE-FOURTHS OF ALL MEMBERS OF THE BOARD OF SUPERVISORS FOR APPROVAL.
DATED this 16th day of January 2025, Pinal County Community Development Dept.
A WRITTEN STATEMENT OF APPROVAL OR PROTEST MAY BE FILED WITH THE PINAL COUNTY PLANNING &

DEVELOPMENT DEPARTMENT, P.O. BOX 749, FLORENCE AZ 85132 STATEMENT MUST CONTAIN THE FOLLOWING INFORMATION:
1) Planning Case Number (see above)
2) Your name, address, telephone number and property tax parcel number (Print or type)
3) A brief statement of reasons for supporting or opposing the request
4) Whether or not your wish to appear and be heard at the hearing
Contacts for this matter: Kendall Riley, Planner
E-mail Address: Kendall.riley@pinal.gov
Phone #: (520) 866-6514 Fax: (520) 866-6530
No. of publications: 1: date of publication: Jan 30, 2025

* as directed by your staff Coordinator

AFFIDAVIT OF Mailing of Notice of Hearing*

I, **Vanessa MacDonald**, Applicant for case numbers **PZ-017-24 and PZ-PD-011-24**, personally caused **six (6)** mailers to be mailed by first class post regarding the public hearing associated with the aforementioned case numbers on **February 3, 2025**, on a form prescribed by the planning division at least 15 days before the Planning and Zoning Commission Public Hearing, regarding the proposed **Rezoning and Planned Area Development (PAD)** applications, in unincorporated Pinal County.

The notice(s) and mailing lists were mailed as attached.

Vanessa MacDonald
Applicant

STATE OF ARIZONA)
) ss:
COUNTY OF PINAL)

Subscribed and sworn to me by Vanessa MacDonald this 3rd day of February, 2025.

Cheryl Long
Notary Public
My Commission Expires:

CHERYL LONG
Notary Public - Arizona
Maricopa County
Commission # 596513
My Comm. Expires Feb 28, 2025

PINAL COUNTY
WIDE OPEN OPPORTUNITY

PINAL COUNTY
DEVELOPMENT SERVICES DEPARTMENT
P O BOX 749 (85 N FLORENCE ST, FIRST FLOOR)
FLORENCE, AZ 85132

Kendall Riley
Planner/ Development Services
85 N. Florence St First Floor
Florence, AZ 85132

NOTICE OF PUBLIC HEARING

NOTICE OF PUBLIC HEARING BY THE PINAL COUNTY PLANNING AND ZONING COMMISSION AT 9:00 A.M. ON THE **20th** DAY OF **FEBRUARY 2025**, AT THE PINAL COUNTY EMERGENCY OPERATIONS CENTER, 85 N FLORENCE, ARIZONA, TO CONSIDER AN APPLICATION FOR **A REZONE** AND **PLANNED AREA DEVELOPMENT (PAD).**

PZ-017-24 - PUBLIC HEARING/ACTION: Gregory C. and Loralee Wuertz Family Trust owner, W. Ralph Pew, Pew & Lake PLC, applicant, requesting approval of a **rezone** from **General Rural (GR)** to **Industrial Zoning (I-3)** on approximately 160± acres to develop a photovoltaic solar energy production facility, situated in a portion of Section 31, T05S, R09E, G&SRB&M, tax parcels 202-35-0040, located in the Coolidge/Valley Farms area east of Highway 87, at the northwest corner of E Bartlett Rd and N Clemens Rd

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DOCUMENTS PERTAINING TO THIS CASE CAN BE FOUND ON THE NOTICE OF HEARING PAGE FOR THE P&Z COMMISSION AT:
https://www.pinal.gov/236/Notice-of-Hearings

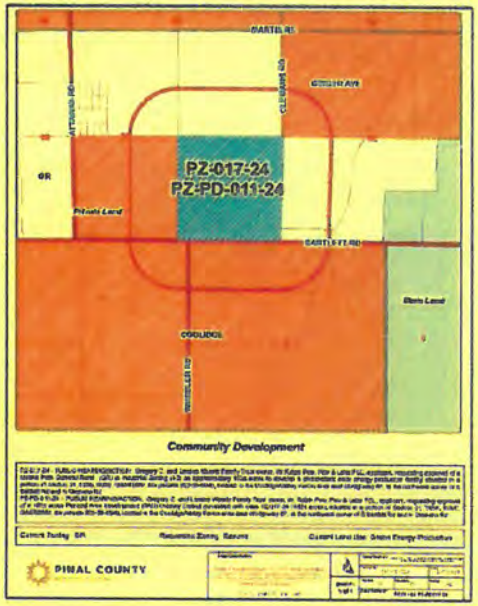
ALL PERSONS INTERESTED IN THIS MATTER MAY APPEAR AT THE HEARING AT THE TIME AND PLACE DESIGNATED ABOVE AND SHOW CAUSE, IF ANY, WHY THIS PETITION SHOULD OR SHOULD NOT BE GRANTED. YOUR STATEMENT MUST CONTAIN THE FOLLOWING INFORMATION:

Planning Case Number (see above), your name, address, telephone number and property tax parcel number (Print or type) A brief statement of reasons for supporting or opposing the request. Whether or not you wish to appear and be heard at the hearing.

PROTESTS TO THE REZONING AND/OR PAD OVERLAY ZONE BY 20% OF THE PROPERTY OWNERS BY AREA AND NUMBER WITHIN 300 FEET OF THE PROPERTY PROPOSED FOR REZONING WILL REQUIRE AN AFFIRMATIVE VOTE OF THREE-FOURTHS OF ALL MEMBERS OF THE BOARD OF SUPERVISORS FOR APPROVAL.

WRITTEN STATEMENTS FOR OR AGAINST THE PROPOSAL MUST BE FILED WITH: PINAL COUNTY COMMUNITY DEVELOPMENT DEPARTMENT PO BOX 749 (85 N.FLORENCE STREET) FLORENCE, AZ 85132, OR BY EMAIL TO THE CASE COORDINATOR INDICATED BELOW.

Contact for this matter: Kendall Riley, Planner
e-mail address: Kendall.riley@pinal.gov
Phone # (520) 866-6514



PINAL COUNTY
WIDE OPEN OPPORTUNITY



NOTICE

PLANNING & ZONING

PINAL COUNTY

PUBLIC HEARING

Any person who is interested may file written comments, in favor or in opposition, with Community Development Department in Pinal County or appear in person at the hearing.

Date Posted: 3 FEB 2025

POST COPY OF ACTUAL NOTICE BELOW.


NOTICE


PINAL COUNTY
Public Hearings
Case Number: PZ-017-24 and PZ-PD-011-24
Existing Zoning: General Rural
Proposed Zoning: Industrial Zoning District (I-3) With a Planned Area Development Overlay
Acreage: 160 Acres
Applicant Name: W. Ralph Pew, Pew & Lake, PLC.
Applicant Phone Number: 480-461-4670
Case Information Available at Pinal County Community Development
(520) 866-6442 or www.pinalcountyaz.gov
Public Hearing Information
NOTICE

NOTICE

PLANNING & ZONING
PINAL COUNTY
PUBLIC HEARING

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Date Posted: 3 FEB 2025

FIRST COPY OF ACTUAL NOTICE BELOW


PINAL COUNTY
Public Hearings

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Public Hearing Information

NOTICE

PLANNING & ZONING
PUBLIC HEARING

3 FEB 2025

