

**Arizona Water Protection Fund
Application Cover Page
FY 2019**

Title of Project: Gila Valley Irrigation District Rapid Appraisal for Modernization

Type of Project:

- Capital or Other
 Water Conservation
 Research

Stream Type:

- Perennial
 Intermittent
 Ephemeral

Your level of commitment to maintenance of project benefits and capital improvements:

- < 5 years 5-10 years 11-15 years 16-20 years

Applicant Information:

Name/Organization: Gila Valley Irrigation District
 Address 1: 2586 W US Hwy 70
 Address 2:
 City: Thatcher
 State: Arizona
 ZIP Code: 85552
 Phone: 928-428-4189
 Fax:
 Tax ID No.: [REDACTED]

Inside an AMA: Yes No

If yes, which AMA:

- Phoenix
 Tucson
 Prescott
 Pinal
 Santa Cruz

Type of Application:

- New
 Continuation

Contact Person:

Name: Justin Layton
 Title: Project Manager
 Phone: 928-965-4568
 Fax:
 e-mail: jglayton@ylfarms.com

Any Previous AWPf Grants:

- Yes No

If yes, please provide Grant #(s):

Arizona Water Protection Fund Grant Amount Requested:

\$ 63,932.50

If the application is funded, will the Grantee intend to request an advance:

- Yes No

Matching Funds Obtained and Secured:

Applicant/Agency/Organization:

Amount (\$):

- | | |
|--------------|-------------------------|
| 1. Applicant | \$6,400 (\$5,000 Cash & |
| 2. | \$1,400 In-kind) |
| 3. | |

Total: \$6,400

Has your legal counsel or contracting authority reviewed and accepted the Grant Award Contract General Provisions?

- Yes No N/A

Signature of the undersigned certifies understanding and compliance with all terms, conditions and specifications in the attached application. Additionally, signature certifies that all information provided by the applicant is true and accurate. The undersigned acknowledges that intentional presentation of any false or fraudulent information, or knowingly concealing a material fact regarding this application is subject to criminal penalties as provided in A.R.S. Title 13. The Arizona Water Protection Fund Commission may approve Grant Awards with modifications to scope items, methodology, schedule, final products and/or budget.

Scott Alder

President, 928-965-1706

Typed Name of Applicant or Applicant's Authorized Representative

Title and Telephone Number

Signature

Date Signed

9/5/18

2. Executive Summary:

The Gila Valley Irrigation District (GVID) is requesting funding to contract with the Irrigation Training and Research Center (ITRC) of California Polytechnic State University to conduct a Rapid Appraisal of the 11 canal systems that make up the Gila Valley Irrigation District. The rapid appraisal will review the entire water delivery system and infrastructure to identify and assist in selection of improvements to increase water and energy efficiency. This review will provide the GVID with the necessary data to complete a plan of action, establish priorities and implement conservation improvements and modernization projects. This project will be on private land, and the GVID owns or holds an easement for all land involved in this project.

The GVID is currently working with the Town of Thatcher to develop a public multi-use recreational trail along the canals. This project is in the beginning planning and coordinating phase.

3. Project Overview:

Background

Project Purpose:

The purpose of this project is to complete a rapid assessment that will identify key factors related to water control in the GVID, define the level of water delivery service provided to users, and examine specific hardware, infrastructure, management techniques and processes used in the control and distribution of water. The anticipated outcome will be that the GVID has a rapid assessment to use for setting priorities in water delivery infrastructure improvement in order to pro-actively plan and implement conservation and modernization projects in the district.

Goals

The goal of this project is to analyze the entire water delivery system to assess and plan for water management projects, modernize the delivery system on the canals and increase on-farm efficiency to provide multiple water-use efficiency benefits. Quantification of areas for modernization of the canals delivery systems is a good starting point that will allow for future canal optimization and automation projects and on farm water conservation projects, which will increase water quality and quantity in the Gila River and conserve water for downstream users.

Objectives

The Gila Valley Irrigation District plans to cooperatively work with partners to conduct a Rapid Appraisal to analyze their entire water delivery system to assess and plan for water management and delivery improvements. The main objective of this review is to gather data that will enable GVID to improve the operations of the district as a whole in order to address water resource challenges. To develop the appraisal CalPoly Irrigation Training Resource Center (ITRC) and the GVID will identify key factors related to water control in the district, define the level of water delivery service provided to users, and examine specific hardware, infrastructure, management techniques and processes used in the control and distribution of water. There has been a push in recent years to reduce conveyance losses and broaden the benefits of water use by using water more effectively in connection with irrigation, stream flow restoration, protection of scenic waterway flows and adhere to downstream water quality requirements. Development of a Rapid Appraisal will provide the district with a benchmark to develop a systematic method for planning and implementing conservation projects.

Statement of Problems/Causes

Agriculture is a major contributor to the area's economy. Therefore, the management of water and land within the district to ensure agricultural sustainability is extremely crucial. Gravity powers the canals, which are designed to take water out of the Gila River via diversions. Water flows downhill, along the valley gradient in canals at a consistent grade, roughly parallel to the river, at an elevation somewhat above that of the river. The canals irrigate fields between them and the river, with any excess or "tail" water returning to the river. However, water flow in the Upper Gila River is very erratic. Spring snow melt in the mountains and monsoon rains in the late summer months feed the river, but drought can occur at any time of year and can last for long periods. Pumps along the river corridor augment river water in canals during times of low flows. Currently, around 20,000 acres are irrigated in the valley. Agricultural producers must rely on surface water for irrigating their crops. The Arizona Water Rights Settlement has had a huge impact on farming in the district. With strict water allocations, farmers must continually search for ways to produce crops with less water. Traditionally, surface flood or furrow irrigation systems have been used. A few farms in the valley have installed drip irrigation systems for conservation and efficiency, but the majority still rely on flood irrigation.

Statement of Solutions

The rapid appraisal will consist of collection and analysis of data both in the office and in the field. If project funding is awarded, we anticipate beginning work immediately. All partners involved are committed and ready to move forward in order to obtain a systematic plan that can be used to implement water efficiency and energy improvements. We expect the appraisal to take 6 months or less to complete. The office portion (research, interviews, data collection) can begin immediately. The field/site visit portion (surveys, infrastructure inventory & evaluations, flow measurements,) will be conducted during irrigation season in early spring to ensure that water is actively flowing and the entire system can be accurately evaluated. The field portion is expected to be completed in less than 2 weeks, and then the final rapid appraisal can be developed. We expect the final appraisal development to be completed by the beginning of 2020 at the latest. . Phased in implementation of appraisal findings and recommendations will enable GVID to improve the districts' ability to manage water and begin the process of prioritizing infrastructure that will be improved and modernized. GVID is currently dually challenged by continued drought conditions and limitations on water usage. While the canal systems work, they are inefficient and do not take advantage of current applicable innovations and technologies that are available. The appraisal will help GVID identify specific and immediate actions that can be easily taken, with a minimum of investment, to improve operation and water management. It will provide a fresh look at the whole system with the goal of being able to provide suggestions for new ways to improve the overall irrigation distribution. The appraisal will provide a systematic project review that will provide GVID with pragmatic recommendations related to improvements in infrastructure and management for the improvement of our water delivery system. The appraisal will use sound science to support critical decision-making, and enable GVID to find opportunities to increase efficiencies, reduce conflict with downstream users, and meet all environmental responsibilities. Assistance from AZ Water Protection Fund will remove a financial impediment and allow GVID to proceed with their plans of system modernization.

Statement of Project Years of Benefit

We feel that this appraisal will provide benefit well over 20 years. Because this project does not require any environmental review and/or design work, the GVID anticipates that this project will take approximately 12-14 months to fully complete which will include planning, field work, reporting and finalizing the Rapid Appraisal document.

4. Project Location & Environmental Contaminant Form

The Gila Valley Irrigation District (GVID) is located along the Gila River in Southeast Arizona, it was organized September 8, 1923, and is made up of 11 canal companies. The canal companies operating within the district are the Brown, Curtis, Dodge-Nevada, Fort Thomas, Graham, Colvin-Jones, Highline, Montezuma, San Jose, Smithville, and the Union. All of these canals are open dirt ditches with the exception of the Montezuma and Brown, which are partially lined. The GVID stretches 35 miles along the Gila River through the cities and towns of Solomon, Safford, Thatcher, Pima, and Fort Thomas.

**Project Location & Environmental Contaminant Information
FY 2019**

Project Location Information <i>extensive project - please see Page 13 for Section,</i>			
1. County: <u>Graham</u>	2. Section(s): _____	3. Township: _____	4. Range: _____ <small>Township & Range locations!</small>
<p>5. Watershed: <u>MIDDLE GILA - SAFFORD BASIN</u></p> <p>6. 8 or 10 Digit Hydrologic Unit Code (HUC): <u>150400057</u></p> <p>7. Name of USGS Topographic Map where project area is located: <u>24,000 - Pima, Thatcher, Eden, Safford</u> <u>San Jose</u></p> <p>8. State Legislative District: <u>14</u> (Information available at: http://azredistricting.org/districtlocator/)</p> <p>9. Land ownership of project area: <u>private easement owned by Gila Valley Irrigation District</u></p> <p>10. Current land use of project area: <u>Agriculture</u></p> <p>11. Size of project area (in acres): <u><36^{miles} DIRECT</u></p> <p>12. Stream Name: <u>11 canals (considered streams?) Gila River</u></p> <p>13. Length of stream through project area: <u>Gila = 11 miles</u></p> <p>14. Miles of stream benefited: <u>11 miles</u></p> <p>15. Acres of riparian habitat: <u>n/a</u> acres will be:</p> <div style="margin-left: 40px;"> <input type="checkbox"/> Enhanced <input type="checkbox"/> Maintained <input type="checkbox"/> Restored <input type="checkbox"/> Created </div>			
<p>16. General description and/or delineation for the area of impact of the project within the watershed. <u>The rapid assessment appraisal will impact all canals within the Gila Valley Irrigation District - over 20,000 acres of farm land & over 36 miles of canal (irrigation delivery system)</u></p> <p>17. Provide directions to the project site from the nearest city or town. List any special access requirements: <u>The canals are located north & south of US HWY 70, north & south of the Town & Solomon, City of Safford & Towns of Thatcher, Pima & Ft Thomas. GUID can give detailed directions to each canal or provide guided site visits.</u></p>			
Environmental Contaminant Location Information			
<p>1. Does your project site contain known environmental contaminants? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If yes, please identify the contaminant(s) and enclose data about the location and levels of contaminants: _____</p> <p>2. Are there known environmental contaminants in the project vicinity? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If yes, please identify the contaminant(s) and enclose data about the location and levels of contaminants: _____</p> <p>3. Are you asking for Arizona Water Protection Fund monies to identify whether or not environmental contaminants are present? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p>			

5. Scope of Work

Task 1: Permits, Authorizations, Clearance & Agreements

Task Description: The Grantee must obtain and submit to the Project Manager all permits, authorizations, clearances and agreements, and perform any consultations necessary to complete the tasks listed in this Scope of Work. These may include but are not limited to:

- State Preservation Office (SHPO) clearance
- National Environmental Policy Act (NEPA) compliance
- Endangered Species Act Section 7 consultation with US Fish and Wildlife Service
- Access agreement(s) between Grantee and Landowner(s)
- Contracts with contractors performing tasks
- Clean Water Act Section 401 Certification from Arizona Department of Environmental Quality
- Clean Water Act Section 404 Permit from Army Corp of Engineers

Task Purpose: To comply with all local, state and federal permit requirements, environmental laws and obtain legal access to project area as applicable.

Deliverable Description: Copies of all approved permits, authorizations, clearances and agreements.

Deliverable Due Date: April 1, 2019

In-kind Cost: \$700.00

Reimbursable Cost: \$0

Task 2: Contract Development for Rapid Appraisal

Task Description: Develop contract with the Irrigation Training and Research Center (ITRC) of California Polytechnic State University to conduct a Rapid Appraisal

Task Purpose: To assess the water delivery system to enable the GVID to systematically plan for improvements and modernization projects.

Deliverable Description: Contract development with CalPoly ITRC to assess entire GVID irrigation water delivery system.

Deliverable Due Date: May 1, 2019

In-kind Cost: \$700.00

Reimbursable Cost: \$0

Task 3: Rapid Appraisal Implementation

Task Description: The Rapid Appraisal development will consist of collection and analysis of data both in the office and in the field.

Task Purpose: To develop a systematic plan for the GVID to use for future improvement and modernization projects.

Deliverable Description: A final written systematic plan that can be used to prioritize and implement water efficiency and energy improvements.

Deliverable Due Date: October 31, 2019

In-kind Cost: \$5,000.00

Reimbursable Cost: \$59,155.00 (Includes 5% Admin)

Task 4: Implement Outreach & Education Plan

Task Description: Grantee will engage the public, local community, and all water users along the Gila Watershed, GVID will conduct a multi-faceted education and outreach program that may include, but is not limited to:

- Local Media Campaign that reaches out to local community
- Presentations at local events and meetings

Task Purpose: To create an awareness of the GVID efforts to improve the quality and quantity of water in the Gila River, and to educate Gila River water users on the importance of water conservation. Educate the community to the next steps GVID is taking to ensure irrigation water in the valley is being used efficiently.

Deliverable Description: Grantee will provide copies of all media campaign materials, photos, power-point presentations, etc.

Deliverable Due Date: December 31, 2019

In-kind Cost: \$0

Reimbursable Cost: \$1,837.50

Task 5: Final Report

Task Description: GVID shall prepare and submit a comprehensive final report consistent with Arizona Water Protection Fund policies and guidelines. This report will include, but is not limited to:

- 1) A summary of project activities
- 2) A discussion of successes and challenges faced
- 3) A conclusion that includes project outcomes

Task Purpose: To document whether project objectives were efficiently and effectively executed. This report shall include a summary of each objective outlined within this application, as well as a budgetary summary.

Deliverable Description: The final report will summarize all methods uses, the outcomes of tasks, evaluation of project goals and objectives, project photos, and evaluation of project success.

Deliverable Due Date: March 31, 2020

In-kind Cost: \$0

Reimbursable Cost: \$2,940 (Includes 5% Admin)

6. Detailed Budget:

Task 1: Permits, Authorizations, Clearances, and Agreements					
Description	Unit Cost	Qty.	Total	Gila Valley Irrigation District	Arizona Water Protection Fund
I. Direct Labor Costs					
Project Manager - Gila Valley Irrigation District (In-Kind)	\$ 35.00	20	\$ 700.00	\$ 700.00	\$0.00
Direct Expenses Total			\$ 700.00		
II. Outside Service Costs					
Outside Expenses Total					
III. Other Direct Costs					
Direct Expenses Subtotal					
IV. Capital Outlay & Equipment Costs					
Capital Outlay & Equipment Subtotal					
TASK SUBTOTAL					
V. Administrative Costs					
Administrative Costs (5%)					
Administrative Subtotal					
TASK SUBTOTAL			\$ 700.00	\$ 700.00	\$0.00

Task 2: Contract Development for Rapid Assessment					
Description	Unit Cost	Qty.	Total	Gila Valley Irrigation District	Arizona Water Protection Fund
I. Direct Labor Costs					
Project Manager - Gila Valley Irrigation District	\$ 35.00	20	\$ 700.00	\$ 700.00	
Direct Expenses Total			\$ 700.00		
II. Outside Service Costs					
Contract with organization to complete Rapid Assessment					
Outside Expenses Total					
III. Other Direct Costs					
Direct Expenses Subtotal					
IV. Capital Outlay & Equipment Costs					
Capital Outlay & Equipment Subtotal					
TASK SUBTOTAL					
V. Administrative Costs					
Administrative Costs (5%)					
Administrative Subtotal					
TASK SUBTOTAL			\$ 700.00	\$700.00	\$0.00

Task 3. Rapid Assessment Implementation					
Description	Unit Cost	Qty.	Total	Gila Valley Irrigation District	Arizona Water Protection Fund
I. Direct Labor Costs					
Project Manager - Gila Valley Irrigation District	\$ 35.00	160	\$ 5,600.00		\$ 5,600.00
Direct Expenses Total			\$ 5,600.00		\$ 5,600.00
II. Outside Service Costs					

Contractor - Complete Rapid Assessment		1	\$ 55,000.00	\$ 5,000.00	\$ 50,000.00
Outside Expenses Total			\$ 55,000.00	\$ 5,000.00	\$ 50,000.00
III. Other Direct Costs					
<i>Direct Expenses Subtotal</i>					
IV. Capital Outlay & Equipment Costs					
Machinery Fuel		1	\$ 250.00		\$ 250.00
Vehicle Fuel		1	\$ 250.00		\$ 250.00
Capital Outlay & Equipment Subtotal			\$ 500.00		\$ 500.00
TASK SUBTOTAL					
V. Administrative Costs					
Administrative Costs (5%)			\$ 3,055.00		\$ 3,055.00
<i>Administrative Subtotal</i>			\$ 3,055.00		\$ 3,055.00
TASK SUBTOTAL			\$ 64,155.00	\$5,000.00	\$ 59,155.00

Task 4: Education & Outreach					
Description	Unit Cost	Qty.	Total	Gila Valley Irrigation District	Arizona Water Protection Fund
I. Direct Labor Costs					
Project Manager - Gila Valley Irrigation District (In-kind)	\$ 35.00	50	\$ 1,750.00		\$ 1,750.00
<i>Direct Expenses Total</i>			\$ 1,750.00		\$ 1,750.00
II. Outside Service Costs					
Outside Expenses Total					
III. Other Direct Costs					
<i>Direct Expenses Subtotal</i>					
IV. Capital Outlay & Equipment Costs					
Capital Outlay & Equipment Subtotal					
TASK SUBTOTAL			\$ 1,750.00		\$ 1,750.00
V. Administrative Costs					
Administrative Costs (5%)			\$ 87.50		\$ 87.50
<i>Administrative Subtotal</i>					
TASK SUBTOTAL			\$ 1,837.50	\$0.00	\$ 1,837.50

Task 5: Final Report					
Description	Unit Cost	Qty.	Total	Gila Valley Irrigation District	Arizona Water Protection Fund
I. Direct Labor Costs					
Project Manager - Gila Valley Irrigation District (In-kind)	\$ 35.00	80	\$ 2,800.00		\$ 2,800.00
<i>Direct Expenses Total</i>			\$ 2,800.00		\$ 2,800.00
II. Outside Service Costs					
Outside Expenses Total					
III. Other Direct Costs					
<i>Direct Expenses Subtotal</i>					
IV. Capital Outlay & Equipment Costs					
Capital Outlay & Equipment Subtotal					
TASK SUBTOTAL			\$ 2,800.00		\$ 2,800.00
V. Administrative Costs					
Administrative Costs (5%)			\$ 140.00		\$ 140.00
<i>Administrative Subtotal</i>					

TASK SUBTOTAL			\$ 2,940.00	\$0.00	\$ 2,940.00
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Total Arizona Water Protection Fund Request:					\$63,932.50
InKind Project Match:				\$	6,400.00
Total Project Budget:					\$70,332.50

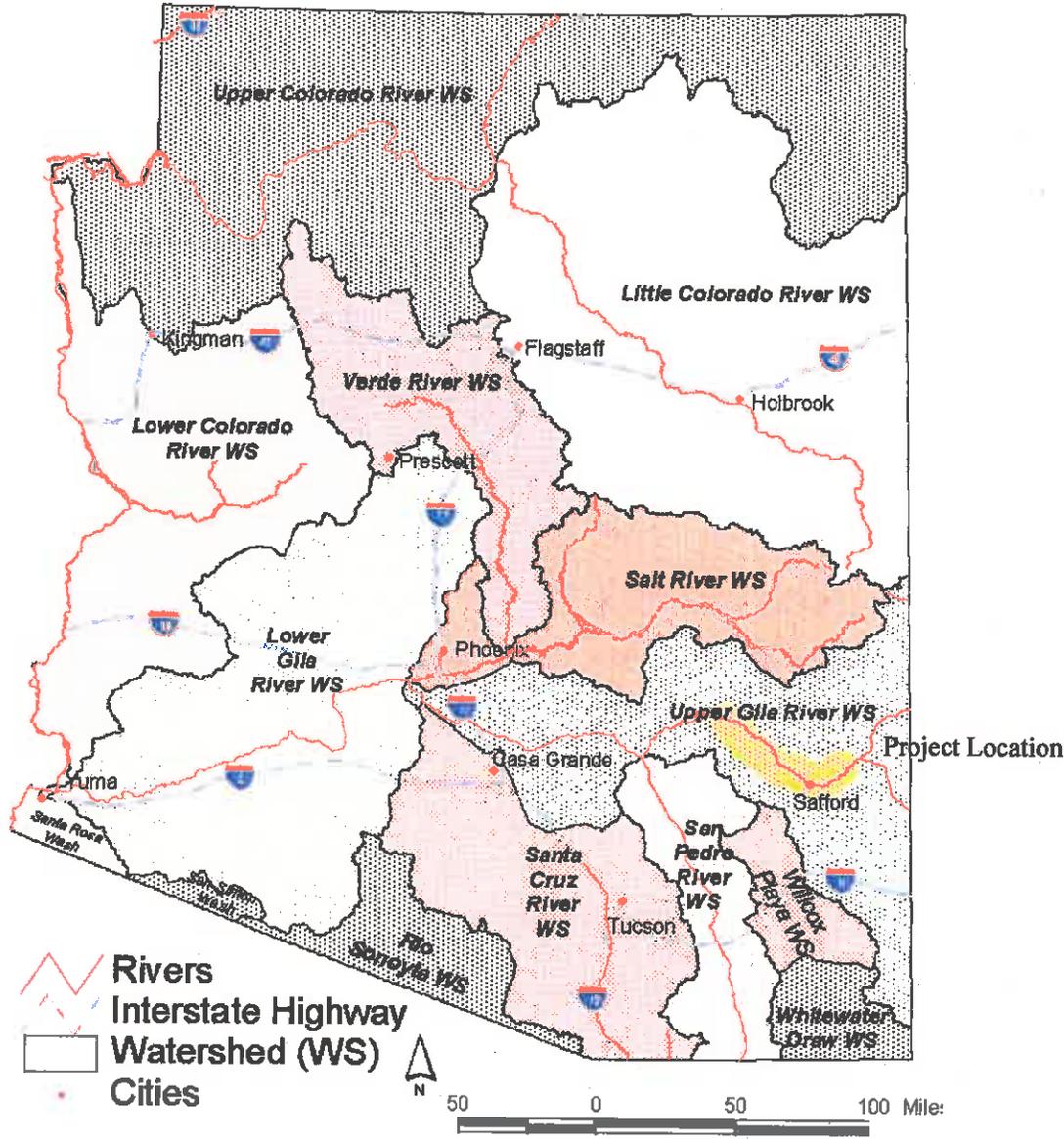
7. Matching Funds

As a collaborative partner to water stewardship efforts in the Gila Valley, Freeport McMoRan is pleased to support the Gila Valley Irrigation District application for the Water Protection Fund. Matching funds of \$5,000 are on hand upon award of the grant. Improving the efficiencies of the canals infrastructure benefit our community as a whole, especially given the positive economic impacts of agriculture in the area.

8. Maps & Schematics

The Gila Valley Irrigation District (GVID) is located along the Gila River in Southeast Arizona, it was organized September 8, 1923, and is made up of 11 canal companies. The canal companies operating within the district are the Brown, Curtis, Dodge-Nevada, Fort Thomas, Graham, Colvin-Jones, Highline, Montezuma, San Jose, Smithville, and the Union. All of these canals are open dirt ditches with the exception of the Montezuma and Brown, which are partially lined. The GVID stretches 35 miles along the Gila River through the cities and towns of Solomon, Safford, Thatcher, Pima, and Fort Thomas.

**Arizona Watershed Map
FY 2019**



Title of Project: Gila Valley Irrigation District Rapid Appraisal for Modernization

Location (include UTM's & Township/Range/Section):
See Attached Legal Descriptions

(Location must include at least one Section delineation for large scale projects)

Smithville: T16S R25E Sec 27, 28, 29, 30 and T16S R41E Sec 24, 33, 34, 35, 36 UTM (approx. mid-point), MAD 83 Zone: 12S Easting: 636521 Northing: 3689593
 Union Canal: T5S R26E Sec 14, 15, 16, 17, 18 T7S R25E Sec 22, 23, 24, 4 T16 R25E Sec 23, 24, 25, 26 T16 R24E Sec 23, 24, 25 UTM (approximate mid-point of canal) MAD 83 Zone: 12S Easting: 612809 Northing: 3683712
 Dodge-Nevada: T16S R25E Sec 23, 24 T15 R24E Sec 23, 24 T55 R24E Sec 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 T55 R24E Sec 24, 25, 26, 27, 28 UTM (approximate mid-point of canal) MAD 83 Zone: 12S Easting: 6146119 Northing: 3646119
 Curtis Canal: T16S R24E Sec 12, T16S R24E Sec 23, 24 T55 R24E Sec 23, 24, 25, 26, 27, 28 and 9 UTM (approximate mid-point of canal) Zone: 12S Easting: 622767 Northing: 3648049
 Colvin-Jones Canal: T15 R25E Sec 24, 25, 26 UTM (approximate mid-point): MAD 83 Zone: 12S Easting: 59555 Northing: 362853
 Brown Canal: T16S R26E Sec 31 T16S R27E Sec 31, 36 T15 R27E Sec 31, 36, 37 UTM (approximate mid-point) MAD 83 Zone: 12S Easting: 636175 Northing: 3655411
 Ft Thomas Canal: T55 R26E Sec 30, 31, 32 T55 R27E Sec 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 T16S R24E Sec 4 UTM (approximate mid-point): MAD 83 Zone: 12S Easting: 597171 Northing: 3659623
 Graham Canal: T15 R26E Sec 5, 6 T16S R26E Sec 31 T16S R25E Sec 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48 T16S R24E Sec 1, 2 UTM (approximate mid-point): MAD 83 Zone: 12S Easting: 613201 Northing: 3642135
 Highline Canal: T15 R26E Sec 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 T15 R25E Sec 24, 25, 26, 27, 28 UTM (approximate mid-point): MAD 83 Zone: 12S Easting: 629400 Northing: 3653340
 Montezuma Canal: T15 R25E Sec 18 T15 R26E Sec 24, 25, 26, 27, 28 UTM (approximate mid-point): MAD 83 Zone: 12S Easting: 614332 Northing: 3650463
 San Jose Canal: T15 R27E Sec 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 UTM (approximate mid-point): MAD 83 Zone: 12S Easting: 628081 Northing: 3652487

Smithville: T6S R25E Sec: 27,28,29,19,30 and T6SR24E Sec 24,13,14,15,10 UTM (approx. midpoint): NAD 83 Zone: 12S Easting: 610321 Northing: 3639593

Union Canal: T7S R26E Sec 14,15,16,17,18 T7S R25E Sec 12,13,2,3,4 T6S R25E Sec(s): 33,32,31,30 T6S R24E Sec(s): 23,24,25 UTM: (approximate midpoint of canal) NAD 83 Zone: 12S Easting: 613909 Northing: 3635212

Dodge-Nevada: T6S R25E Sec(s): 18 T6S R24E Sec(s): 13,14 T6SR24E sec(s): 9,10,11 T5S R24E sec(s): 4,5,32,31 T5S R23E sec(s): 36,25,24,23,14 UTM: (approximate midpoint of canal): NAD 83 Zone: 12S Easting: 604321 Northing: 3644119

Curtis Canal: T6S R24E Sec 12, T6S R24E sec(s): 2,3,4 T5S R24E Sec(s): 33,28,21,20,17 and 8 UTM: (approximate mid-point of canal) Zone: 12s Easting: 602767 Northing: 3648989

Colvin/Jones Canal: T4S R23E Sec 26,22,21 UTM (approximate mid-point): NAD 83 Zone: 12S Easting: 59555 Northing: 3658953

Brown Canal: T6S R28E Sec 31 T6S R27E Sec 35,36 T7S R27E Sec 3,4,6,7,9 UTM (approximate mid-point): NAD 83 Zone: 12S Easting: 633173 Northing: 3635411

Ft Thomas Canal: T5S R24E Sec 30,19 T5S R23E Sec 24,13,12,11,2,32,31 T4S R23E Sec 35, 34, 33, 29, 28, 30,19 T6S R24E Sec 4 UTM (approximate mid-point): NAD 83 Zone: 12S Easting: 597171 Northing: 3655623

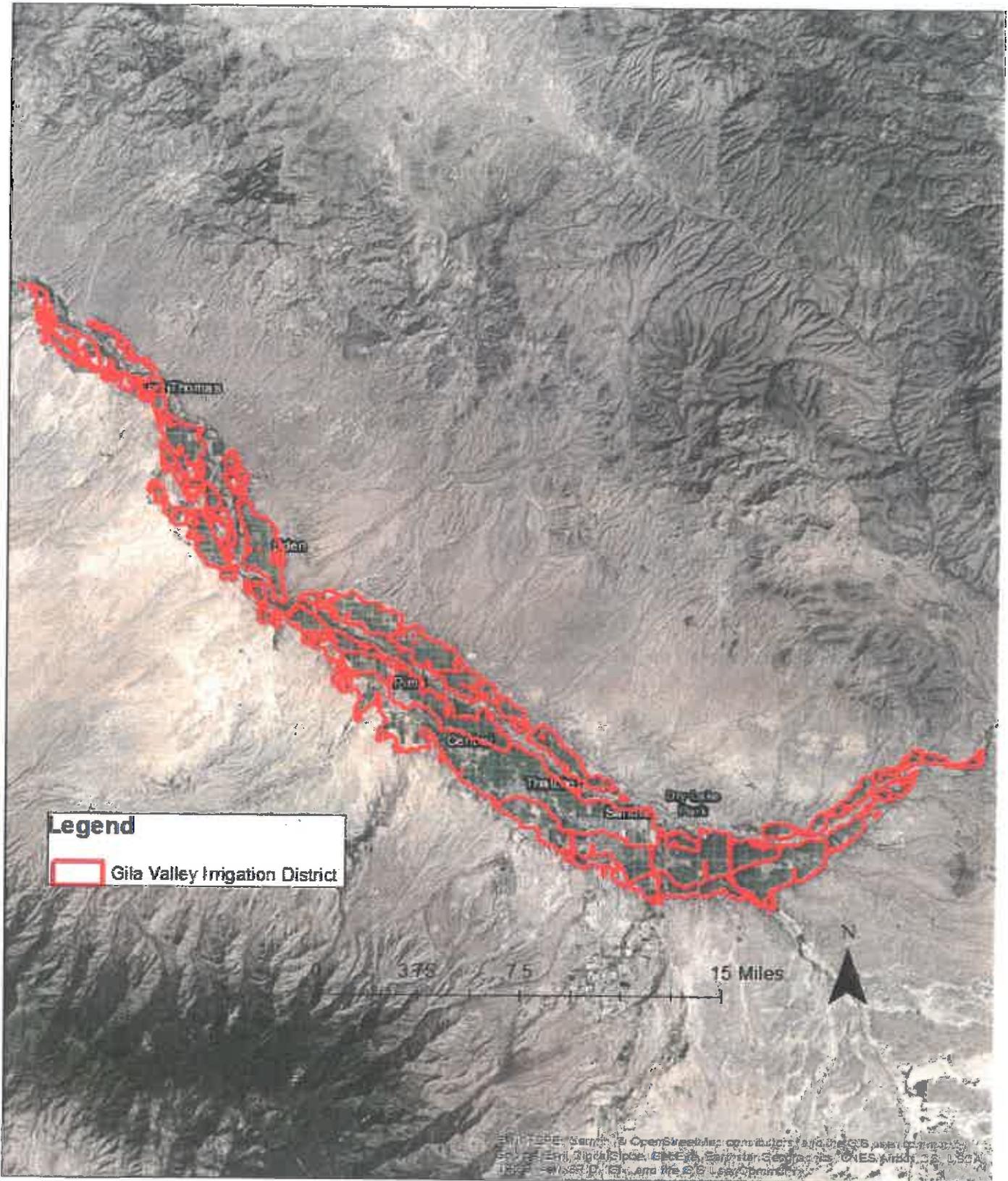
Graham Canal: T7S R26E Sec 5, 6 T6S R26E Sec 31 T6S R25E Sec 36, 25, 23, 22, 15, 16, 9, 8, 7, 6 T6S R24E Sec 1, 2 UTM (approximate mid-point): NAD 83 Zone: 12S Easting: 613021 Northing: 3642115

Highline Canal: T7S R26E Sec 20, 19, 25, 26, 27, 28 T7S R25E Sec 24, 13, 14, 11, 10 T7S R27E Sec 30 UTM (approximate mid-point): NAD 83 Zone: 12S Easting: 619988 Northing: 3631380

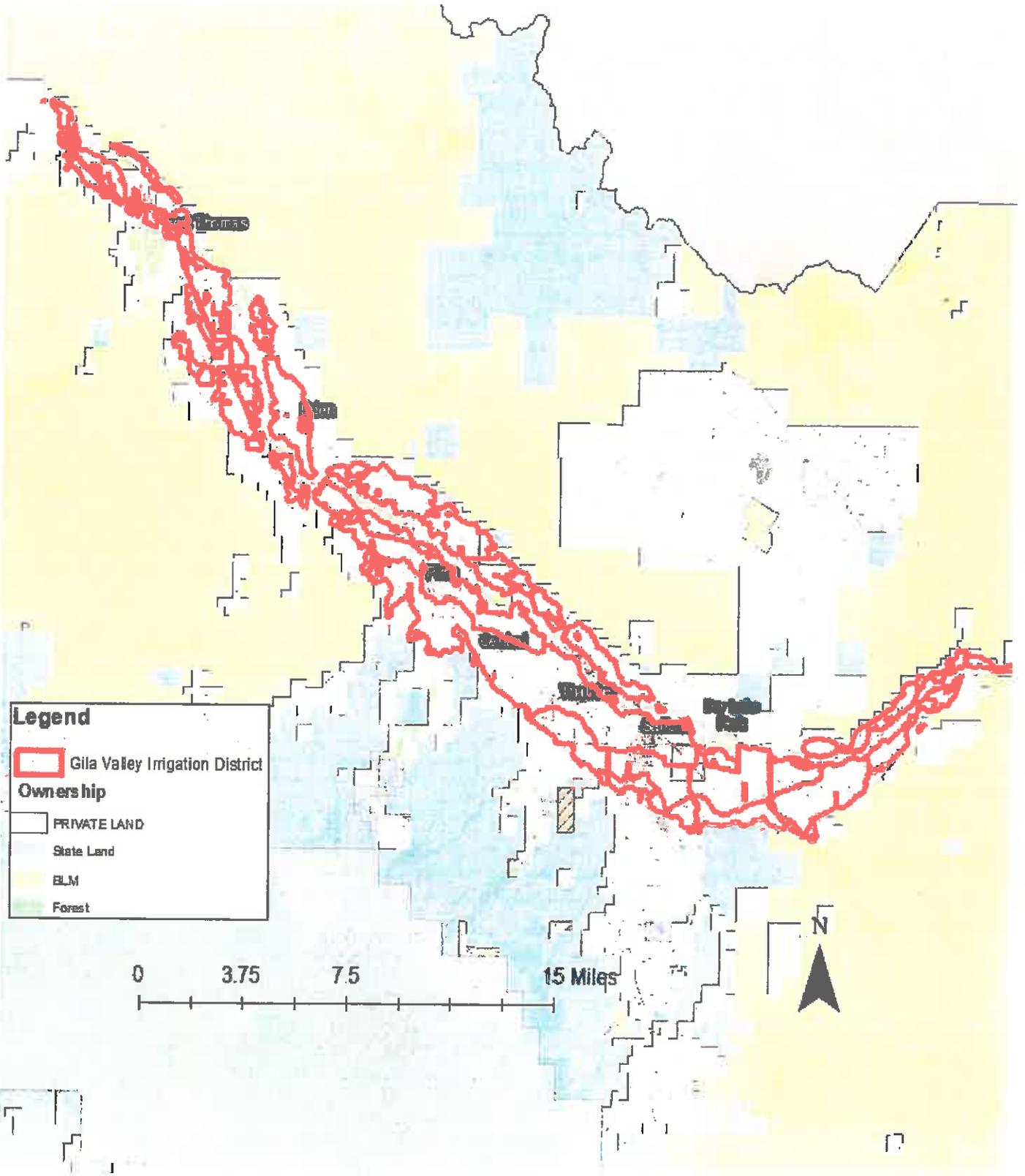
Montezuma Canal: T7S R27E Sec 18 T7S R26E Sec 24, 23, 22, 21 UTM (approximate mid-point): NAD 83 Zone: 12S Easting: 624232 Northing: 3630413

San Jose Canal: T7S R27E Sec 2, 3, 10, 16, 20, 19, 30 UTM (approximate mid-point): NAD 83 Zone: 12s Easting: 628081 Northing: 3629497

Project Location Map



Project Ownership Map



STATE HISTORIC PRESERVATION OFFICE Review Form

In accordance with the State Historic Preservation Act (SHPO), A.R.S. 41-861 *et seq.*, effective July 24, 1982, each State agency must consider the potential of activities or projects to impact significant cultural resources. Also, each State agency is required to consult with the State Historic Preservation Officer with regard to those activities or projects that may impact cultural resources. Therefore, it is understood that **recipients of state funds are required to comply with this law** throughout the project period. All projects that affect the ground-surface that are funded by AWPf require SHPO clearance, **including those on private and federal lands.**

The State Historic Preservation Office (SHPO) must review each grant application recommended for funding in order to determine the effect, if any, a proposed project may have on archaeological or cultural resources. To assist the SHPO in this review, the following information **MUST** be submitted with each application for funding assistance:

- A completed copy of this form, and
 - A United States Geological Survey (USGS) 7.5 minute map
 - A copy of the cultural resources survey report if a survey of the property has been conducted, and
 - A copy of any comments of the land managing agency/landowner (i.e., state, federal, county, municipal) on potential impacts of the project on historic properties.
- NOTE: If a federal agency is involved, the agency must consult with SHPO pursuant to the National Historic Preservation Act (NHPA); a state agency must consult with SHPO pursuant to the State Historic Preservation Act (SHPA),
- OR
- A copy of SHPO comments if the survey report has already been reviewed by SHPO.

Please answer the following questions:

1. Grant Program: AZ Water Protection Fund
2. Project Title: GVID Rapid Appraisal
3. Applicant Name and Address: Gila Valley Irrigation District + 2586 W US HWY 70
THATCHER AZ 85552
4. Current Land Owner/Manager(s): Gila Valley Irrigation District
5. Project Location, including Township, Range, Section: please see attached maps & locations
6. Total Project Area in Acres (or total miles if trail): 230
7. Does the proposed project have the potential to disturb the surface and/or subsurface of the ground?
 YES NO
8. Please provide a brief description of the proposed project and specifically identify any surface or subsurface impacts that are expected: The grant application is to fund an assessment to optimize/modernize arria canal systems - no ground disturbing activities will take place
9. Describe the condition of the current ground surface within the entire project boundary area (for example, is the ground in a natural undisturbed condition, or has it been bladed, paved, graded, etc.). Estimate
The area within the application is an existing canal system & related support infrastructure such as roads, gates & ditches.

horizontal and vertical extent of existing disturbance. Also, attach photographs of project area to document condition: The cross and lateral gates that will be replaced in the proposed project are currently in use. — Photos attached

10. Are there any known prehistoric and/or historic archaeological sites in or near the project area? YES
 NO Canals were built prior to 1920

11. Has the project area been previously surveyed for cultural resources by a qualified archaeologist? YES
 NO UNKNOWN

If YES, submit a copy of the survey report. Please attach any comments on the survey report made by the managing agency and/or SHPO ATTACHED

12. Are there any buildings or structures (including mines, bridges, dams, canals, etc.), which are 50-years or older in or adjacent to the project area? YES NO ALL CANALS

If YES, complete an Arizona Historic Property Inventory Form for each building or structure, attach it to this form and submit it with your application.

13. Is your project area within or near a historic district? YES NO

If YES, name of the district:

Please sign on the line below certifying all information provided for this application is accurate to the best of your knowledge.

 9/5/18 Scott Alden
Applicant Signature /Date Applicant Printed Name

FOR SHPO USE ONLY

SHPO Finding:

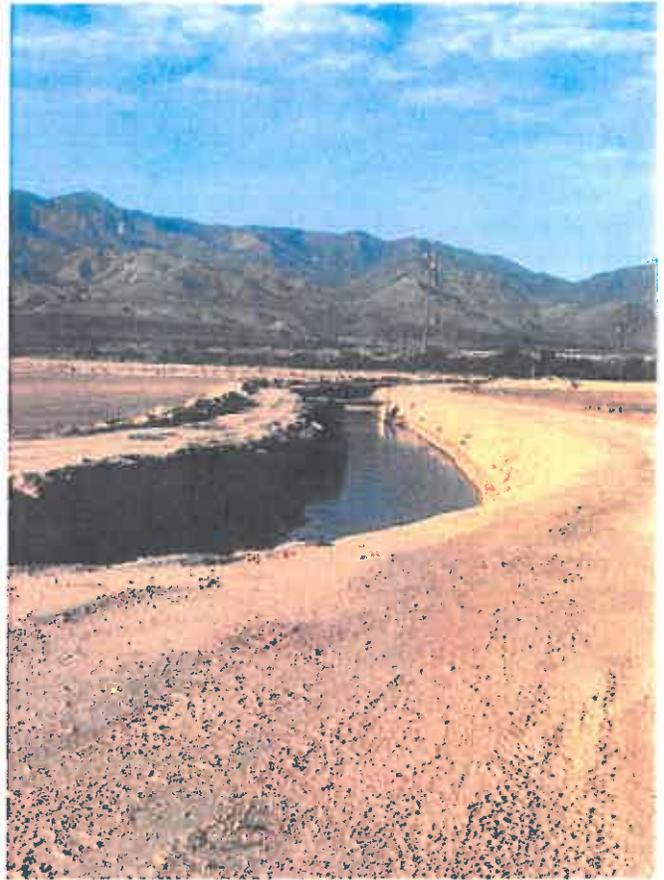
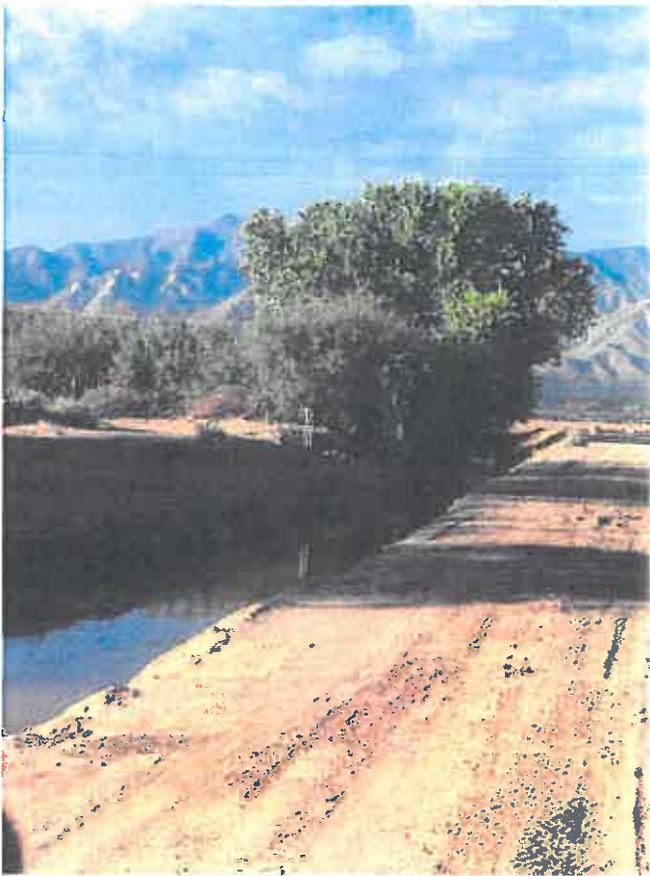
- Funding this project will not affect historic properties.
- Survey necessary – further GRANTS/SHPO consultation required (*grant funds will not be released until consultation has been completed*)
- Cultural resources present – further GRANTS/SHPO consultation required (*grant funds will not be released until consultation has been completed*)

SHPO Comments:

For State Historic Preservation Office:

Date:

Example of typical canal within the Gila Valley Irrigation District



DODGE/NEJADA CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): Dodge - Nejada

2526 W US HWY 70
Address: Thotwv. AZ 85552

City or Town: PIMA Vicinity County: GILBERT Tax Parcel No.: W/a T6S R24E sec 4,5,32,31
T6S R25E sec 12 T6S R24E sec 13,14
T6S R24E sec 11,10,9,
T5S R23E sec 36,25,24
Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: 23.814

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference -- Zone: 12S Easting: 604321 Northing: 3644119 (approximate midpoint)
NAD 83

USGS 7.5' quadrangle map: PIMA 2 E EDEN

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIG. DISTRICT & DEED MAPS

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: irrigation canal

Sources: GID

PHOTO INFORMATION

Date of photo: 2/15
View Direction (looking towards): ~

Attach a recent photograph of property in this space. Additional photographs may be appended.
typical canal photo attached

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS – Describe any historic events/trends associated with the property: UNK

B. PERSONS – List and describe persons with an important association with the building: UNK

C. ARCHITECTURE – Style: _____ no style

Stories: NA Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: UNK

MATERIALS

Describe the materials used in the following elements of the property: DIRT CANAL

~~Walls (structure): _____~~

~~Walls (sheathing): _____~~

~~Windows: _____~~

~~Roof: _____~~

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: rural, agrarian

How has the environment changed since the property was constructed? UNK

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: N/A

NATIONAL REGISTER STATUS (if listed, check the appropriate box) NOT LISTED

Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

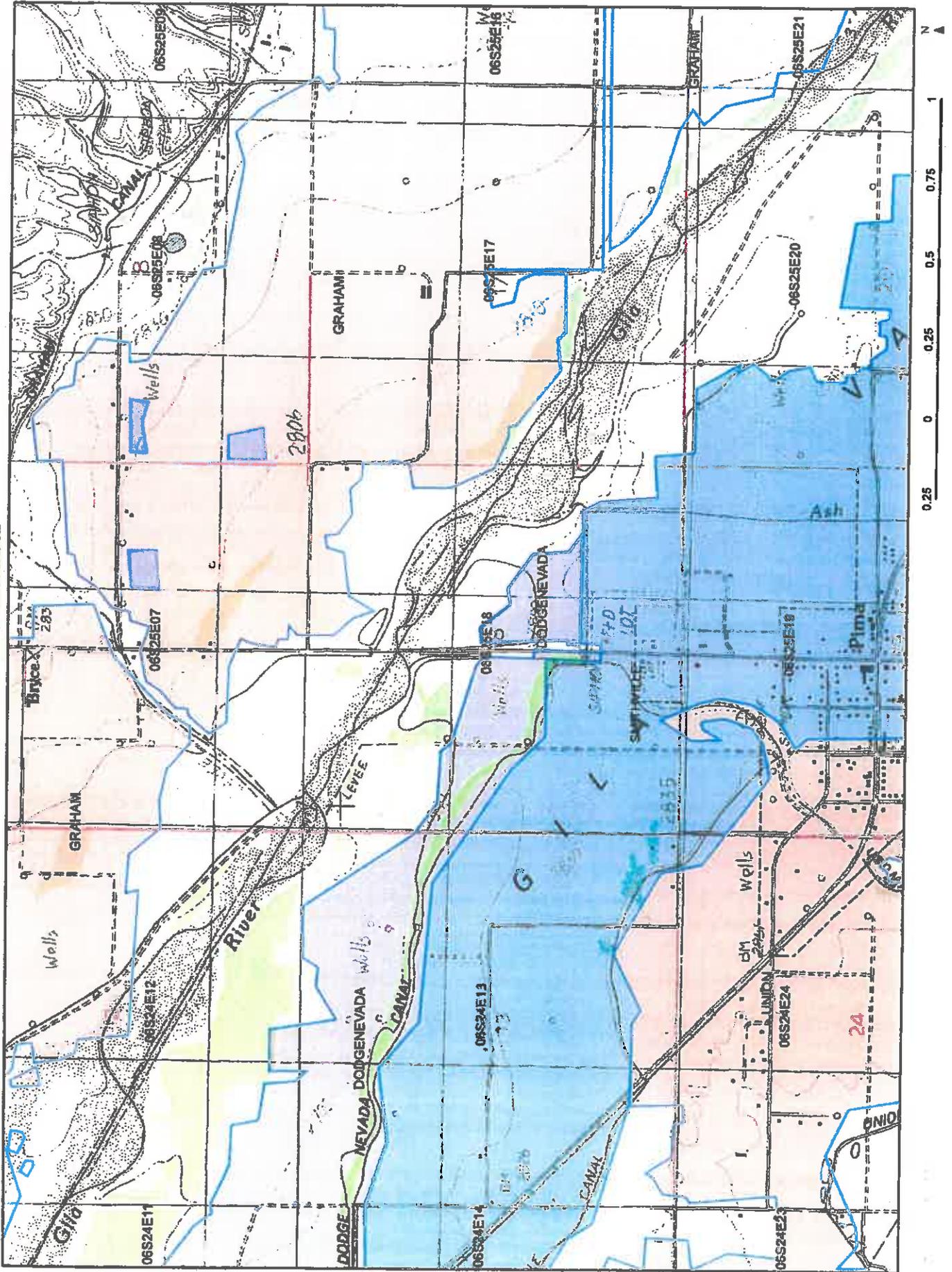
Property is is not eligible individually.

Property is is not eligible as a contributor to a listed or potential historic district.

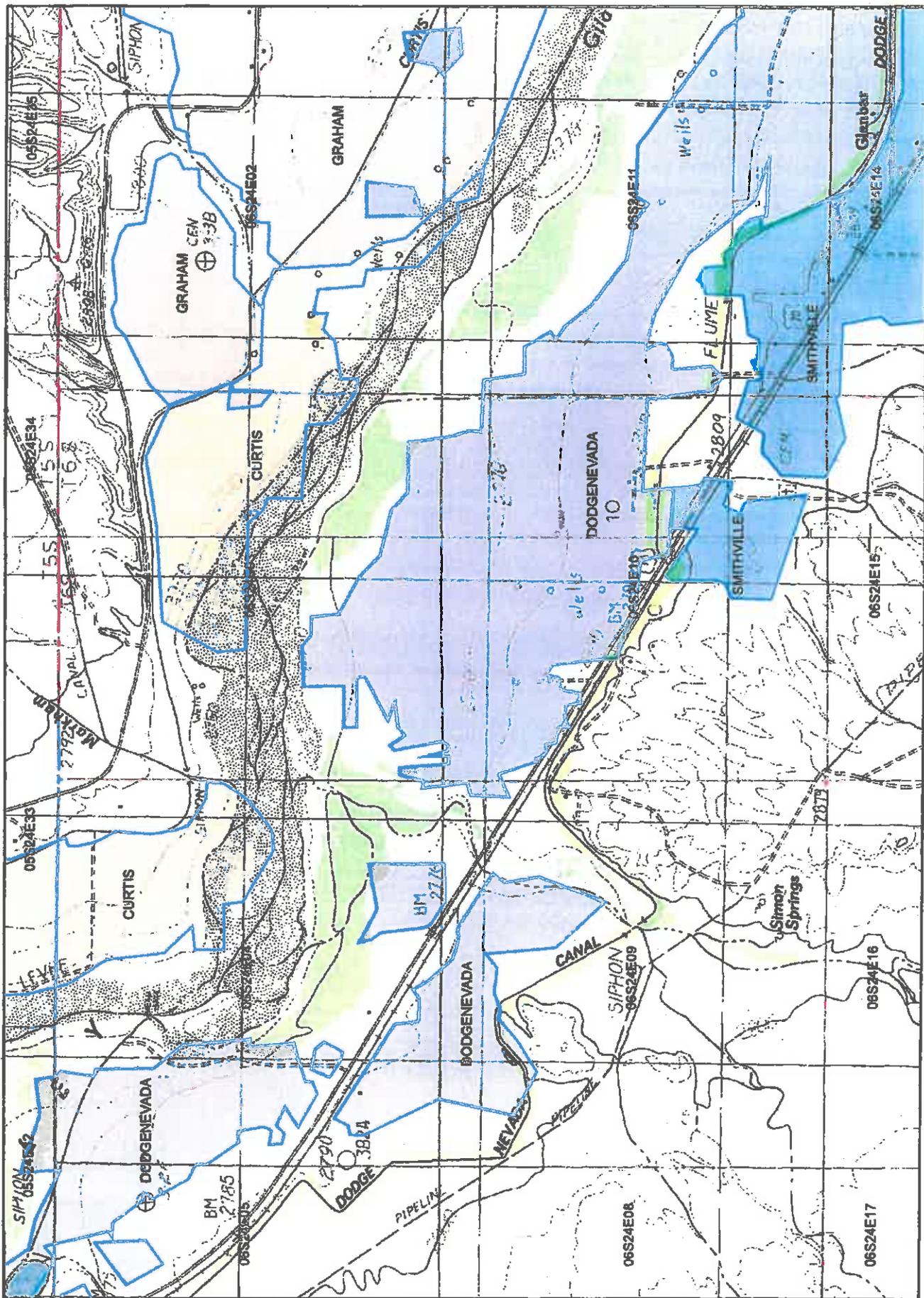
More information needed to evaluate.

If not considered eligible, state reason: _____

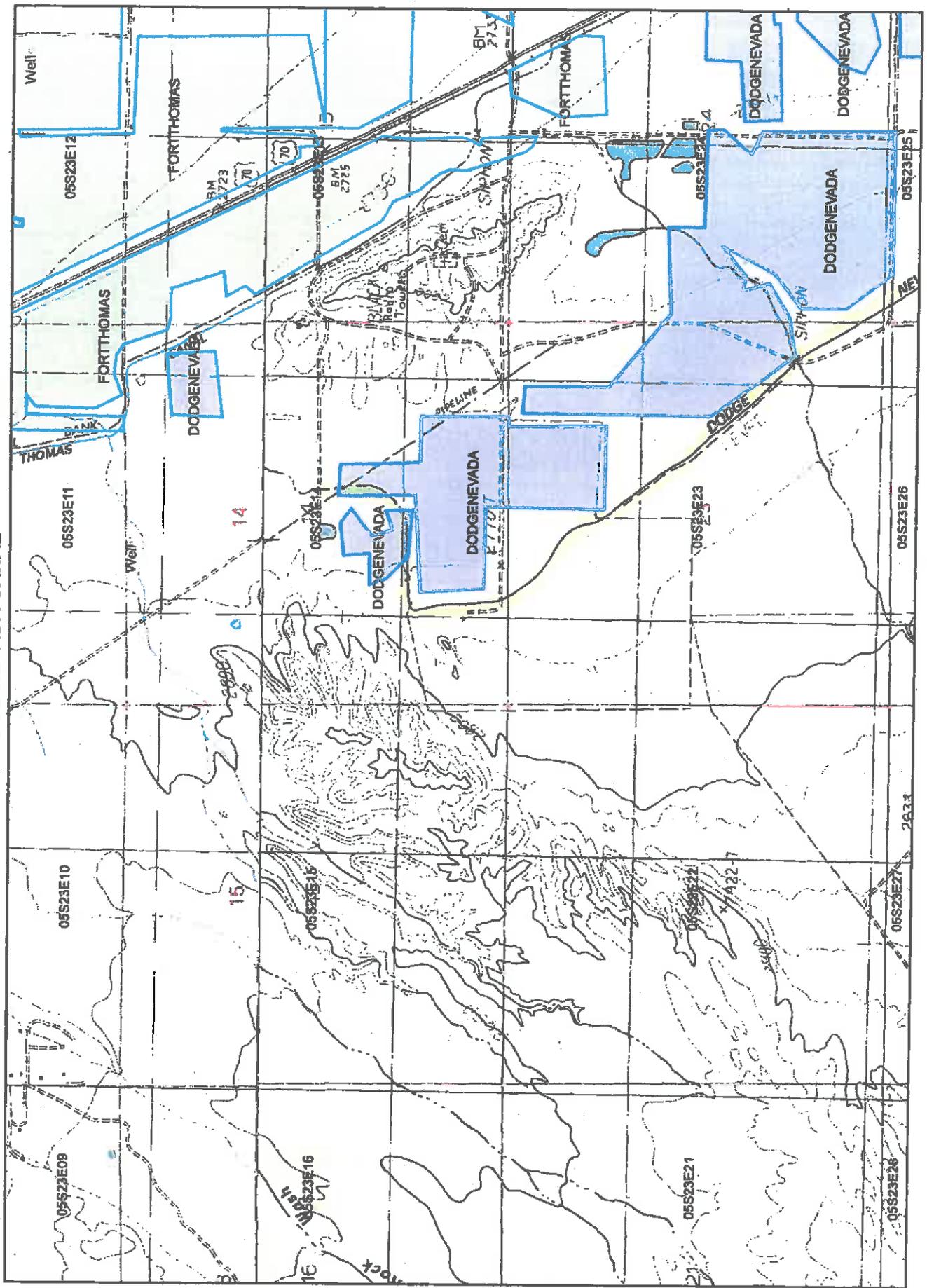
DODGE-NEVADA CANAL



DODGE-NEVADA CANAL



DODGE-NEVADA CANAL



CURTIS CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): Curtis Canal
2586 W US HWY 70
Address: HATCHER AZ 85552 T6S R24E S012, T6E R24E S02, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

City or Town: Glendale Vicinity County: Graham Tax Parcel No.: NA

Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: Passport Survey available on request

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference - Zone: 12S Easting: 602767 Northing: 3648989 (approximate midpoint)
NAD 83

USGS 7.5' quadrangle map: PIMA & EDEL

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIG. DISTRICT & DEWEE MAPS (GVID)

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: canal is/was used to water fields between the canal & the Gila River
Sources: GVID/Curtis Canal, etc

Attach a recent photograph of property in this space. Additional photographs may be appended.

Typical canal photo attached

PHOTO INFORMATION

Date of photo: 8/15
View Direction (looking towards): _____

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS - Describe any historic events/trends associated with the property: unk.

B. PERSONS - List and describe persons with an important association with the building: unk.

C. ARCHITECTURE - Style: unk. no style

Stories: unk. Basement Roof Form: unk.

Describe other character-defining features of its massing, size and scale: unk.

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: unk. Original Site: unk.

DESIGN

Describe alterations from the original design, including dates: unk.

MATERIALS

Describe the materials used in the following elements of the property: DIET CANAL

Walls (structure): unk.

Walls (sheathing): unk.

Windows: unk.

Roof: unk.

Foundation: unk.

SETTING

Describe the natural and/or built environment around the property: rural, agration

How has the environment changed since the property was constructed? unk.

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: unk.

NATIONAL REGISTER STATUS (if listed, check the appropriate box) not listed

Individually Listed; Contributor; Non-contributor to unk. Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

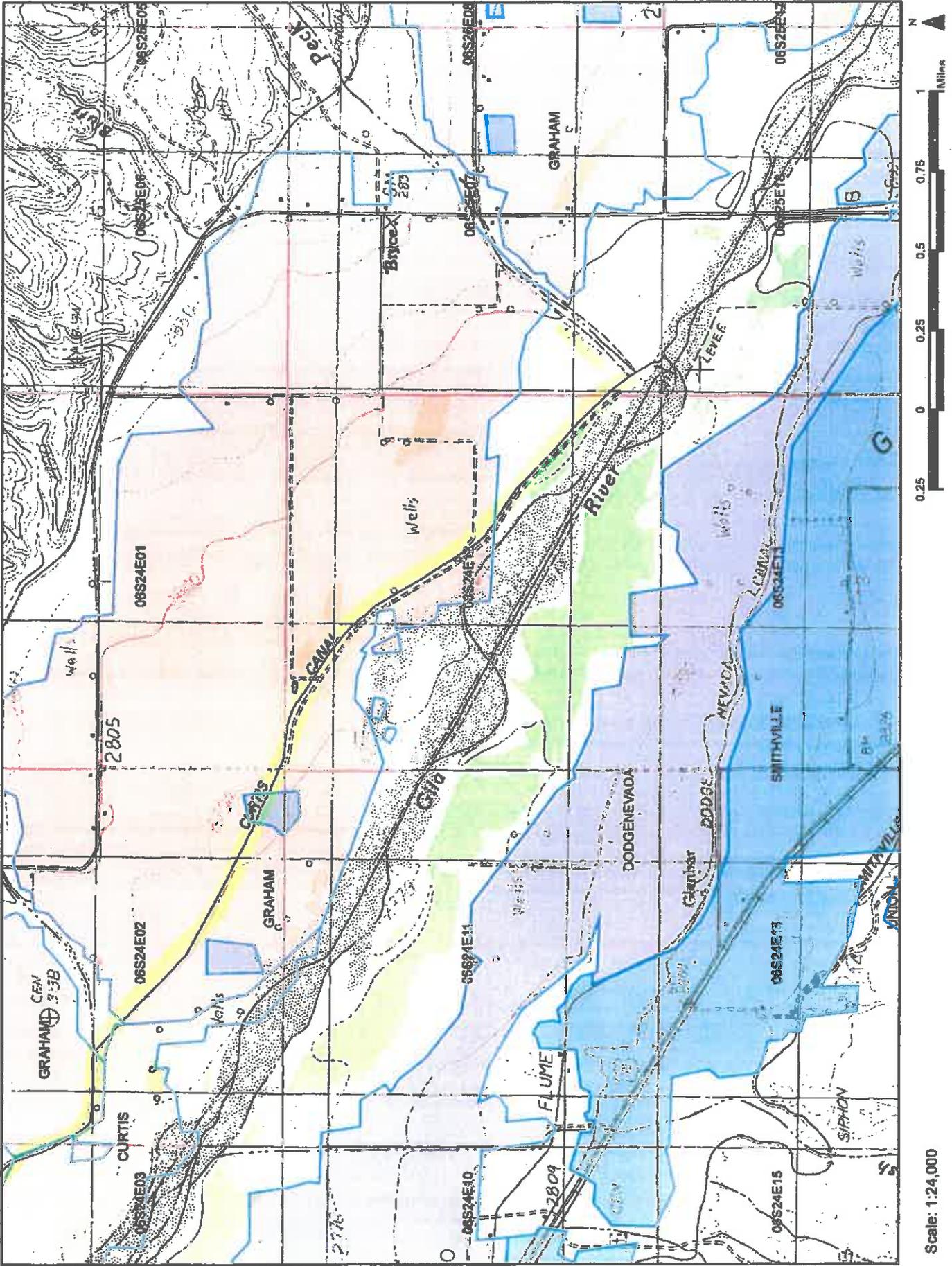
Property is is not eligible individually.

Property is is not eligible as a contributor to a listed or potential historic district.

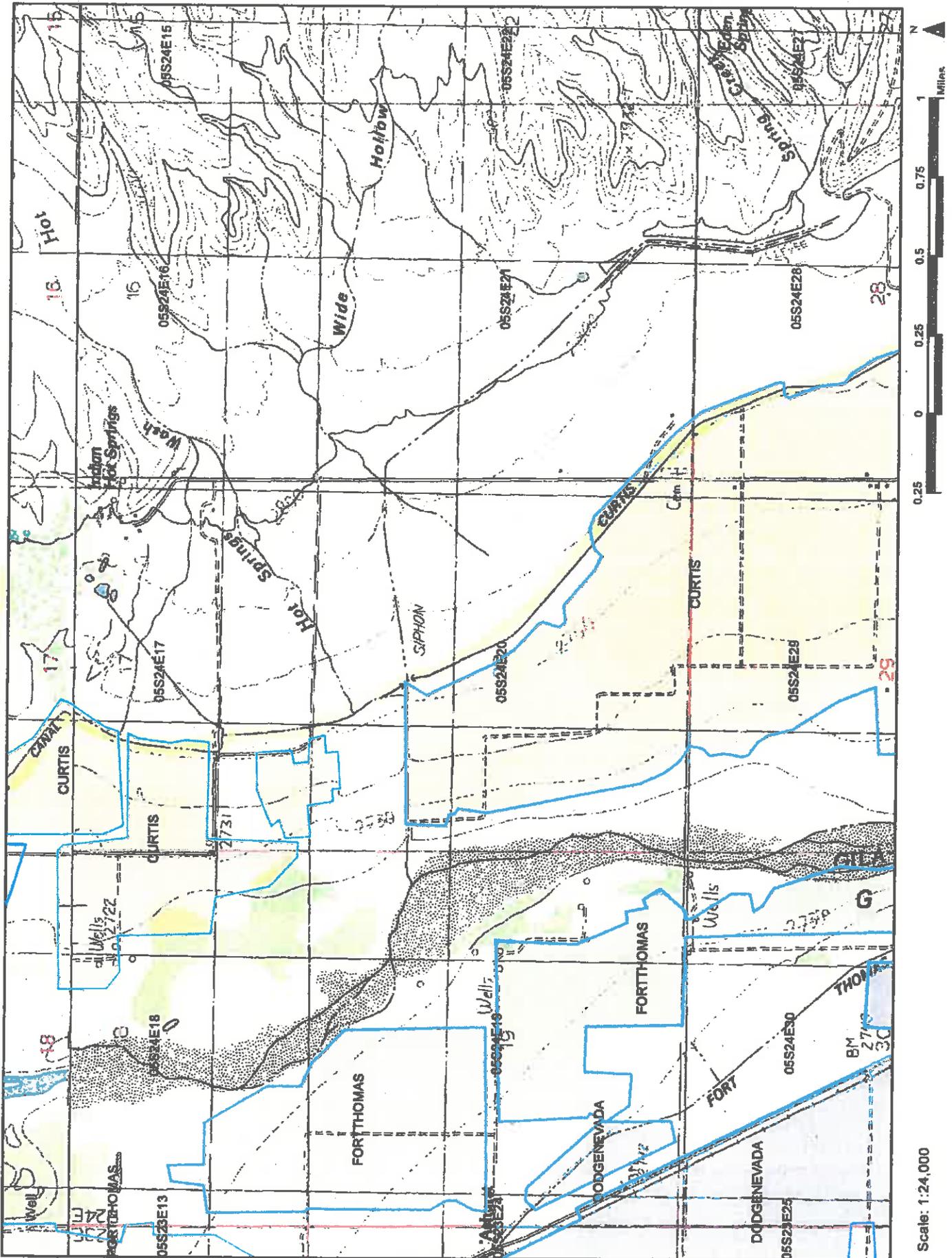
More information needed to evaluate.

If not considered eligible, state reason: _____

CURTIS CANAL



CURTIS CANAL



**STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM**

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. Survey Area:

Historic Names (enter the name(s), if any that best reflect the property's historic importance): Calvin Jones (2011)
2586 W US HWY 20
 Address: Interlock AZ 85252 T4S R23E S0= 26(SW 1/4), 27(NE 1/4)
SEC 22(SW 1/4), SEC 21 (S 1/2 of N 1/2)

City or Town: Eden Vicinity County: Graham Tax Parcel No.: X

Township: Range: Section: Quarters: Acreage:

Block: Lot(s): Plat (Addition): Year of plat (addition):

UTM Reference - Zone: 12S Easting: 595552 Northing: 3658933 (approximated midpoint)
 NAD 83

USGS 7.5' quadrangle map: FORT THOMAS

ARCHITECT: not determined known Source:

BUILDER: not determined known Source:

CONSTRUCTION DATE: 1920's known estimated Source: Gila Valley Irrigation District
decree maps

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe:
- Poor (major problems; imminent threat) Describe:
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: canal is used to irrigate fields between it & Gila River
 Sources: GVID
Calvin Jones

Attach a recent photograph of property in this space. Additional photographs may be appended.

Typical canal photo attached

PHOTO INFORMATION

Date of photo: 8/15
 View Direction (looking towards): ~

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS - Describe any historic events/trends associated with the property: _____

Constant use since construction

B. PERSONS - List and describe persons with an important association with the building: N/A

C. ARCHITECTURE - Style: _____ no style

Stories: _____ Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: unknown

MATERIALS

Describe the materials used in the following elements of the property: DIRT CANAL

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: rural, agrarian setting

How has the environment changed since the property was constructed? no

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: unknown

NATIONAL REGISTER STATUS (if listed, check the appropriate box) N/A

Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

Property is is not eligible individually.

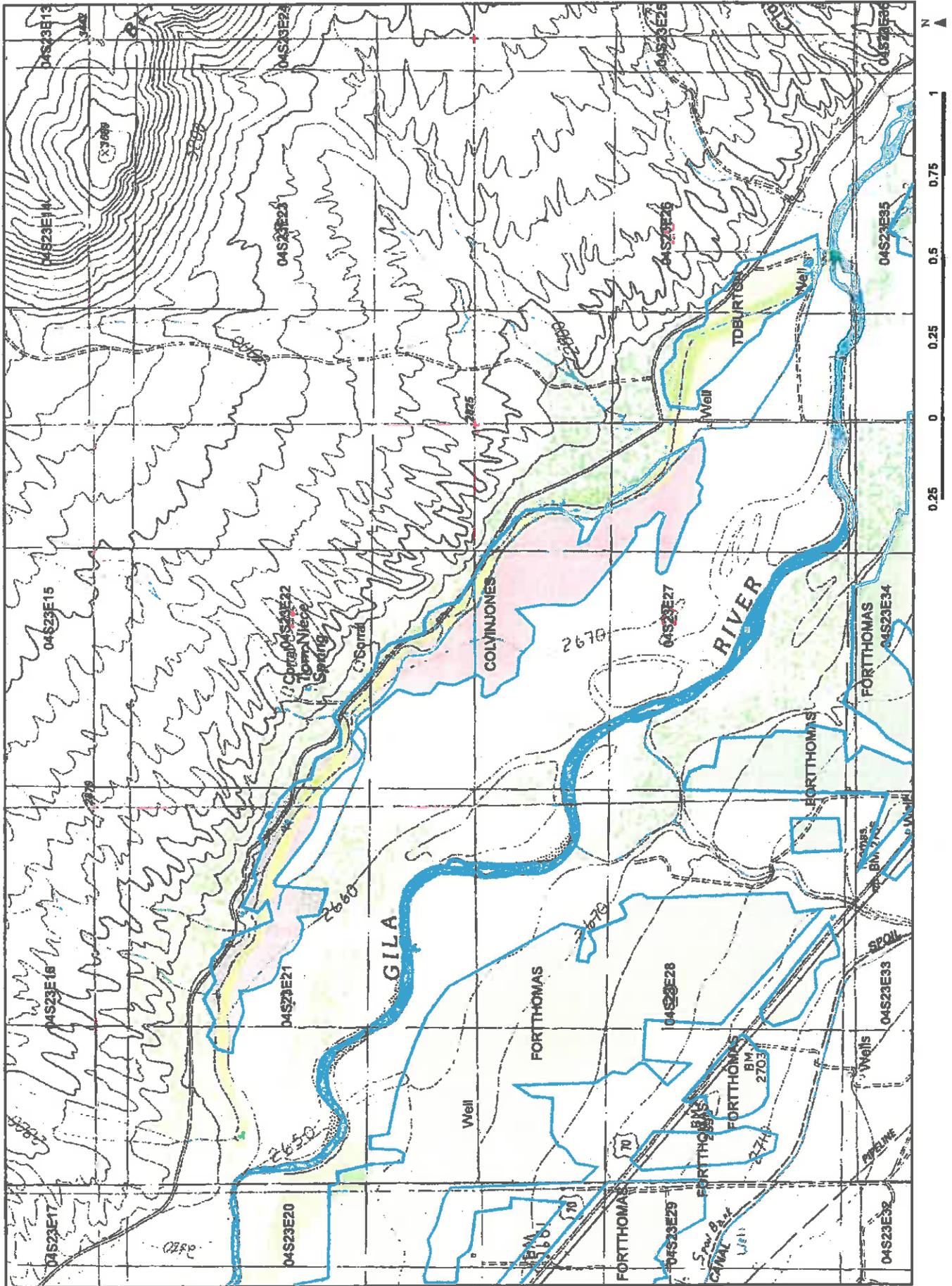
Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

If not considered eligible, state reason: _____

1 of 1

Colvin-Jones Canal



BROWN CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): Brown Canal

Address: 2586 W US HWY 70
Thatcher, AZ 85552

City or Town: _____ Vicinity County: Graham Tax Parcel No.: N/A

Township: S Range: 7 Section: 2 Quarters: _____ Acreage: assessment
Survey available
upon request

Block: Lot(s): Plat (Addition): Year of plat (addition):

UTM Reference - Zone: 12N Easting: 633173 Northing: 363541 (approximate mid point)

USGS 7.5' quadrangle map: SAN JOSE

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: Gila Valley Irrigation District & Decree maps

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: Canal is used to irrigate farms between it

Sources: 6/11/10 at the Gila River this continues to present day

PHOTO INFORMATION

Date of photo: 9/15
View Direction (looking towards): _____

Attach a recent photograph of property in this space. Additional photographs may be appended.

typical photo attached

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS - Describe any historic events/trends associated with the property: N/A

B. PERSONS - List and describe persons with an important association with the building: N/A

C. ARCHITECTURE - Style: NA no style

Stories: _____ Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: N/A

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: no changes

MATERIALS

Describe the materials used in the following elements of the property: N/A - div. can't

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: N/A

How has the environment changed since the property was constructed? N/A

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: N/A

NATIONAL REGISTER STATUS (if listed, check the appropriate box)

Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: 11/14 Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

Property is is not eligible individually.

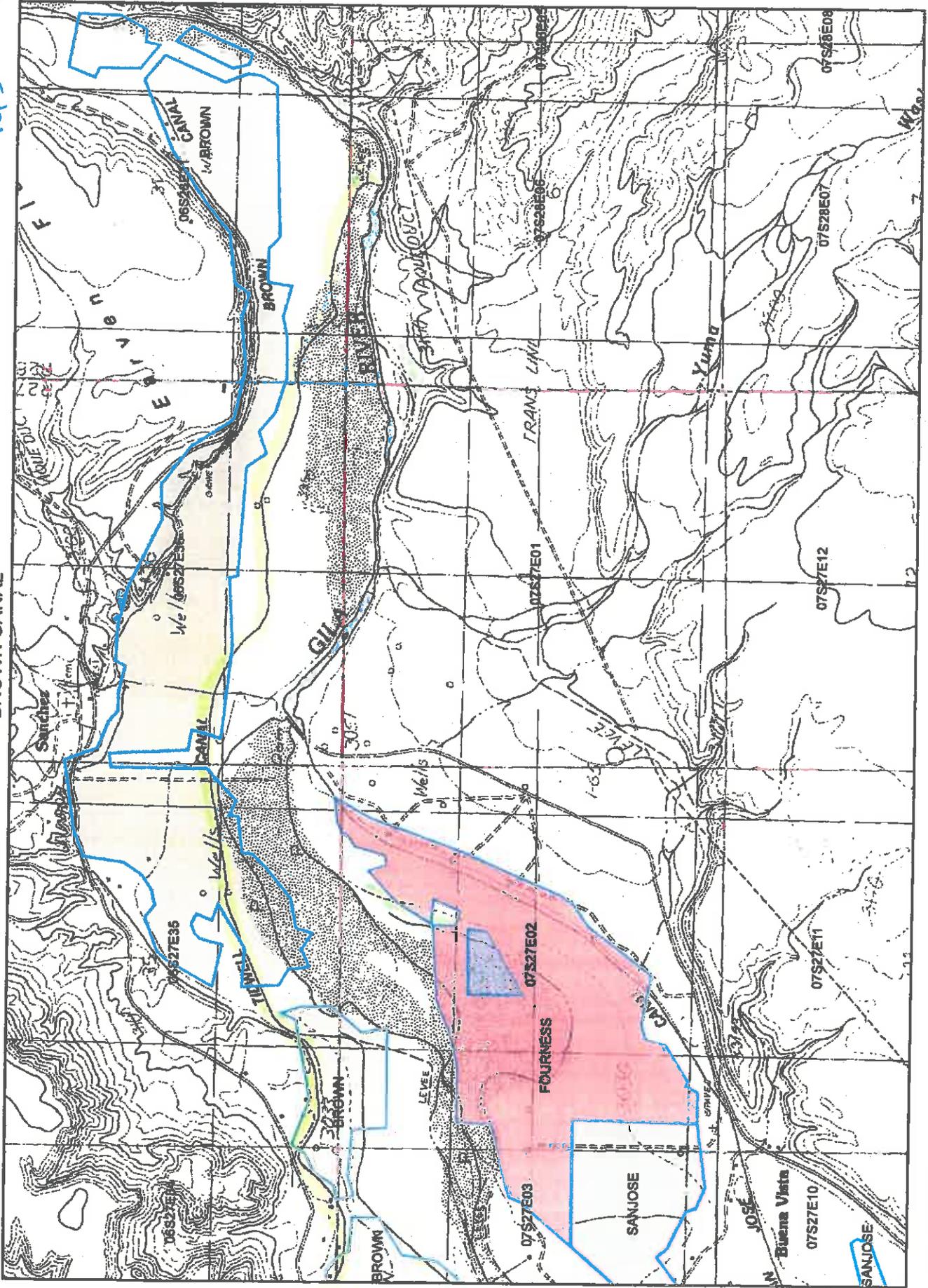
Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

If not considered eligible, state reason: _____

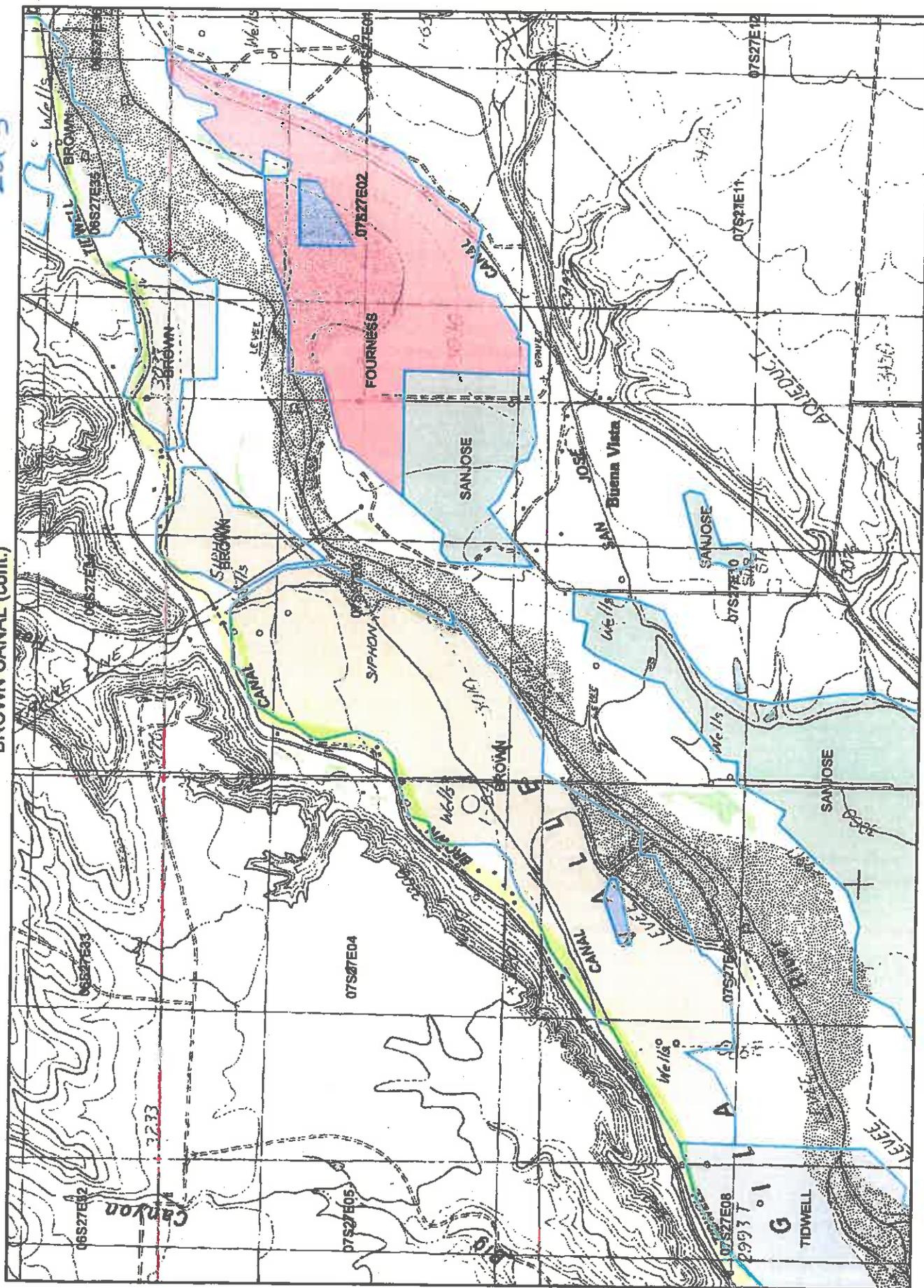
1072

BROWN CANAL



Scale: 1:24,000

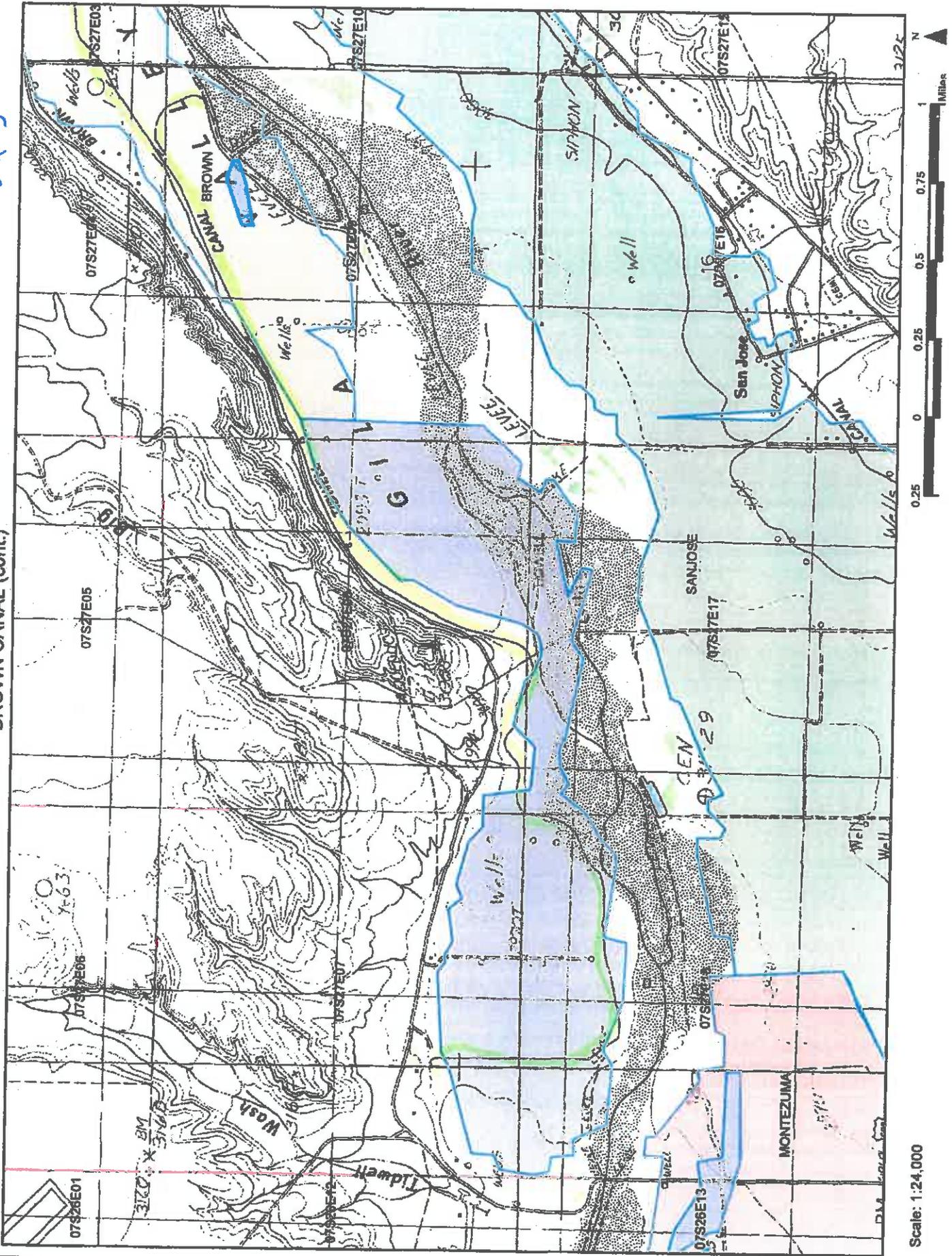
BROWN CANAL (cont.)



Scale: 1:24,000



BROWN CANAL (cont.)



Scale: 1:24,000

FT THOMAS CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): Ft Thomas Canal

Address: 2506 W US HWY 70
Thatcher AZ 85302

City or Town: Ft Thomas Vicinity County: Graham

T55R24E S10C19 T55R23E Sec 24, 13, 12, 11, 10
T45R23E Sec 35, 34, 33, 29, 28, 30 & 19 32+
T65R24E Sec 4
Tax Parcel No.: X

Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: _____

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference - Zone: 12S Easting: 527171 Northing: 3655623 (approximate midpoint)
NAD 83

USGS 7.5' quadrangle map: FT THOMAS, GERONIMO & EDEN

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIGATION DISTRICT (GVID)
DEGREE MAPS

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: irrigation of farm fields

Sources: GVID/Ft Thomas Canal

PHOTO INFORMATION

Date of photo: 9/15
View Direction (looking towards): _____

Attach a recent photograph of property in this space. Additional photographs may be appended.

typical photo attached

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS – Describe any historic events/trends associated with the property: Unk

B. PERSONS – List and describe persons with an important association with the building: Unk

C. ARCHITECTURE – Style: _____ no style

Stories: _____ Basement ~~Roof Form:~~ _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: Unk

MATERIALS

Describe the materials used in the following elements of the property: PORT CANAL

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: rural agrarian

How has the environment changed since the property was constructed? Unk

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: _____

NATIONAL REGISTER STATUS (if listed, check the appropriate box) NOT LISTED

Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

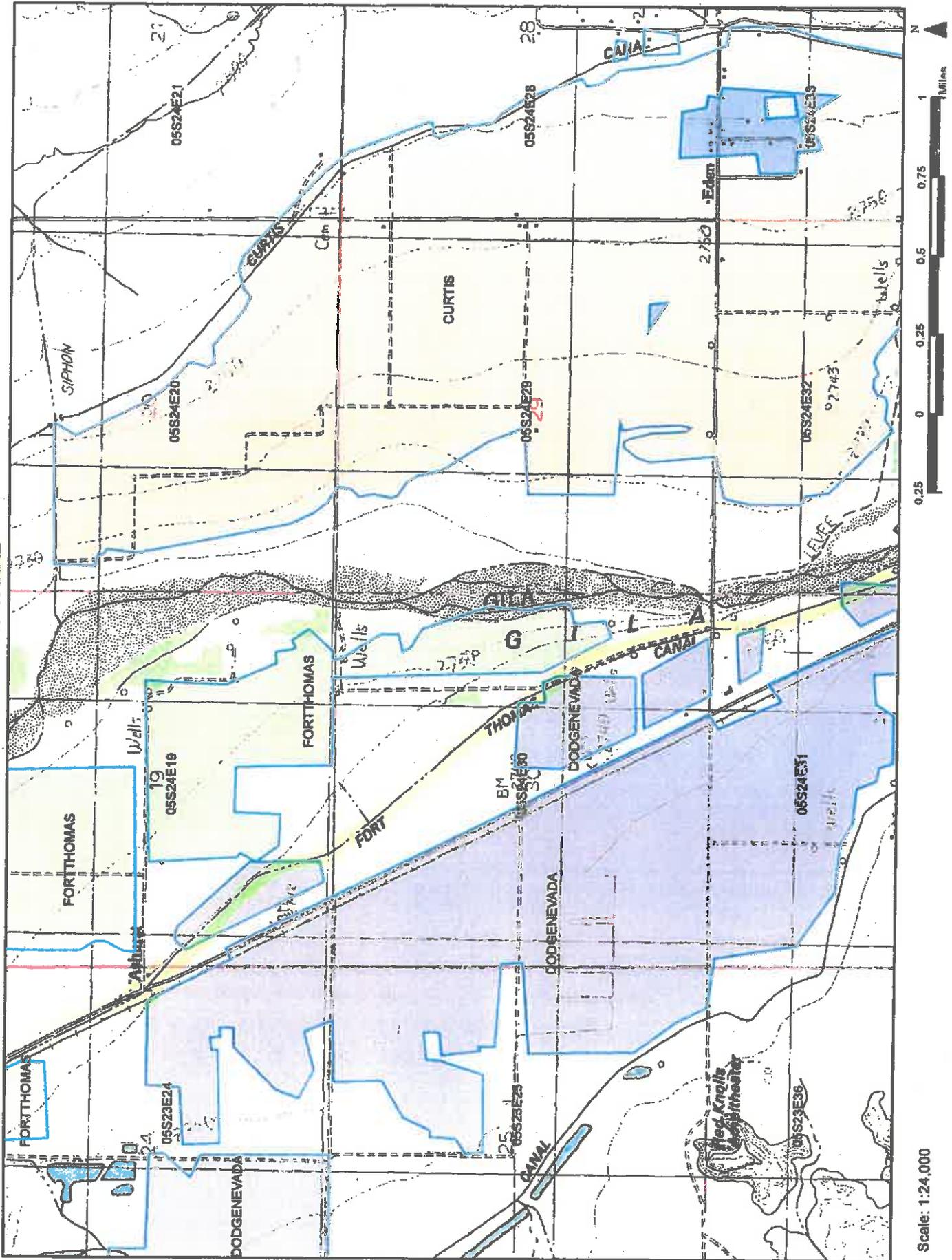
Property is is not eligible individually.

Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

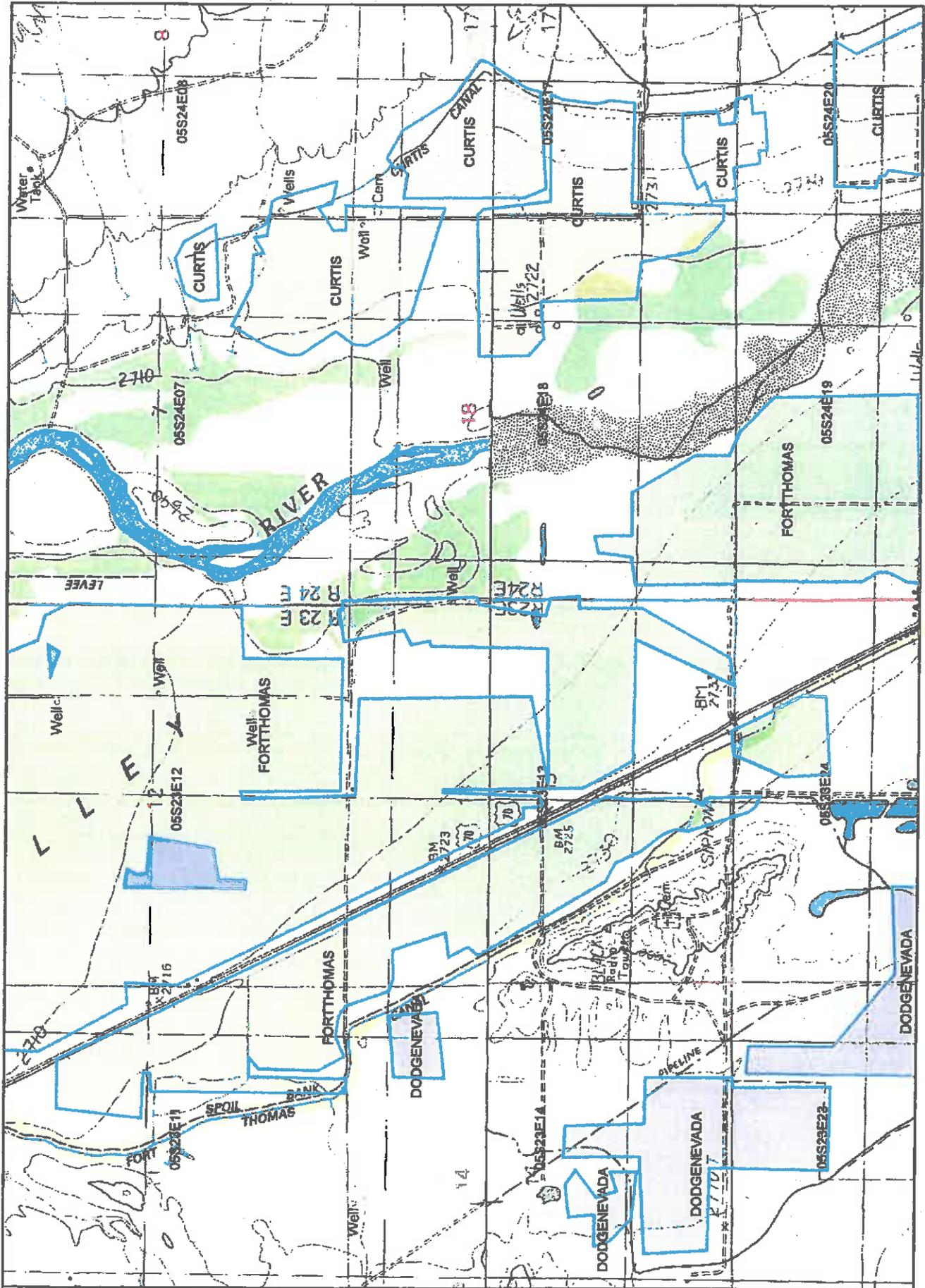
If not considered eligible, state reason: _____

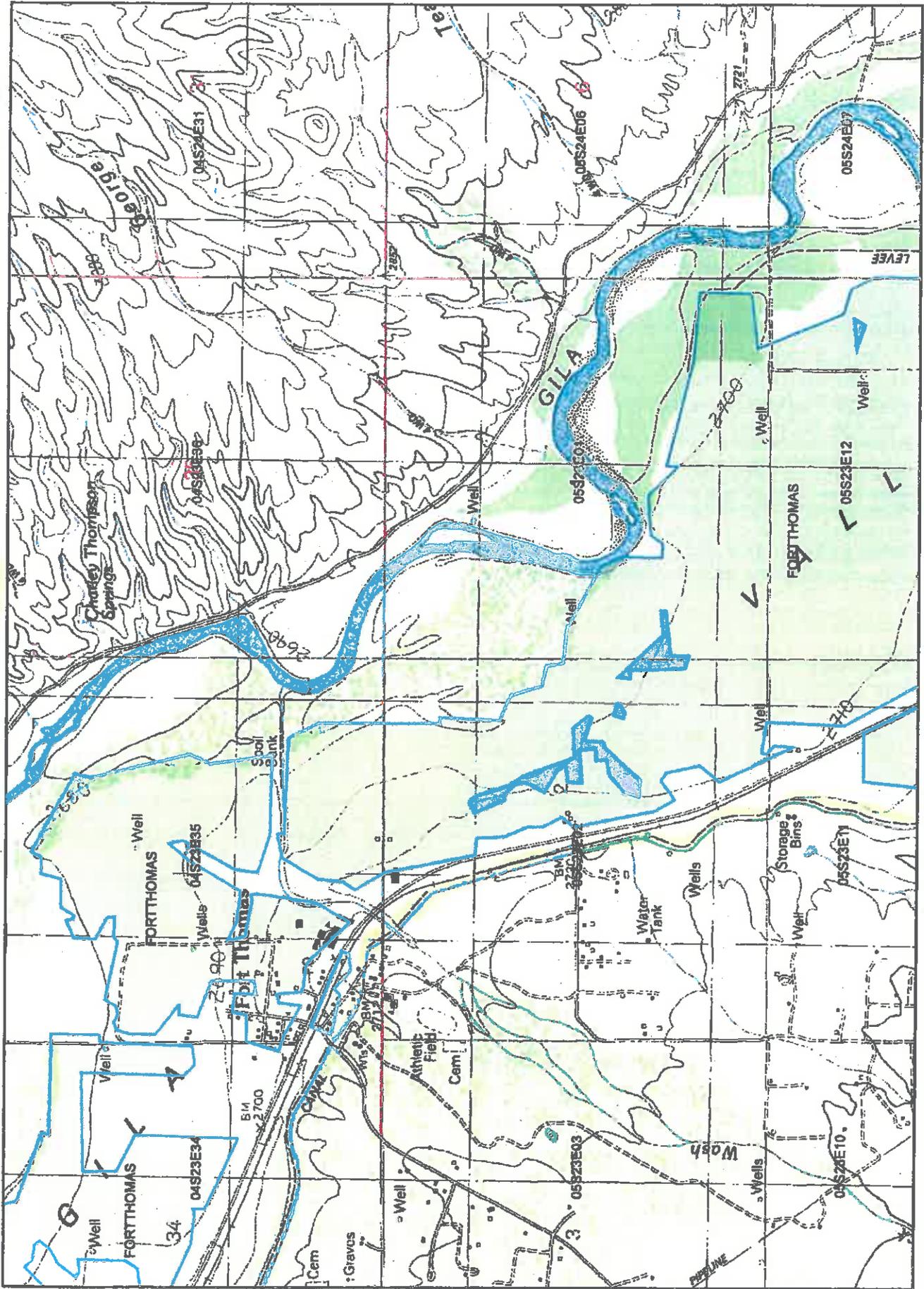
FT THOMAS CANAL



FT THOMAS CANAL

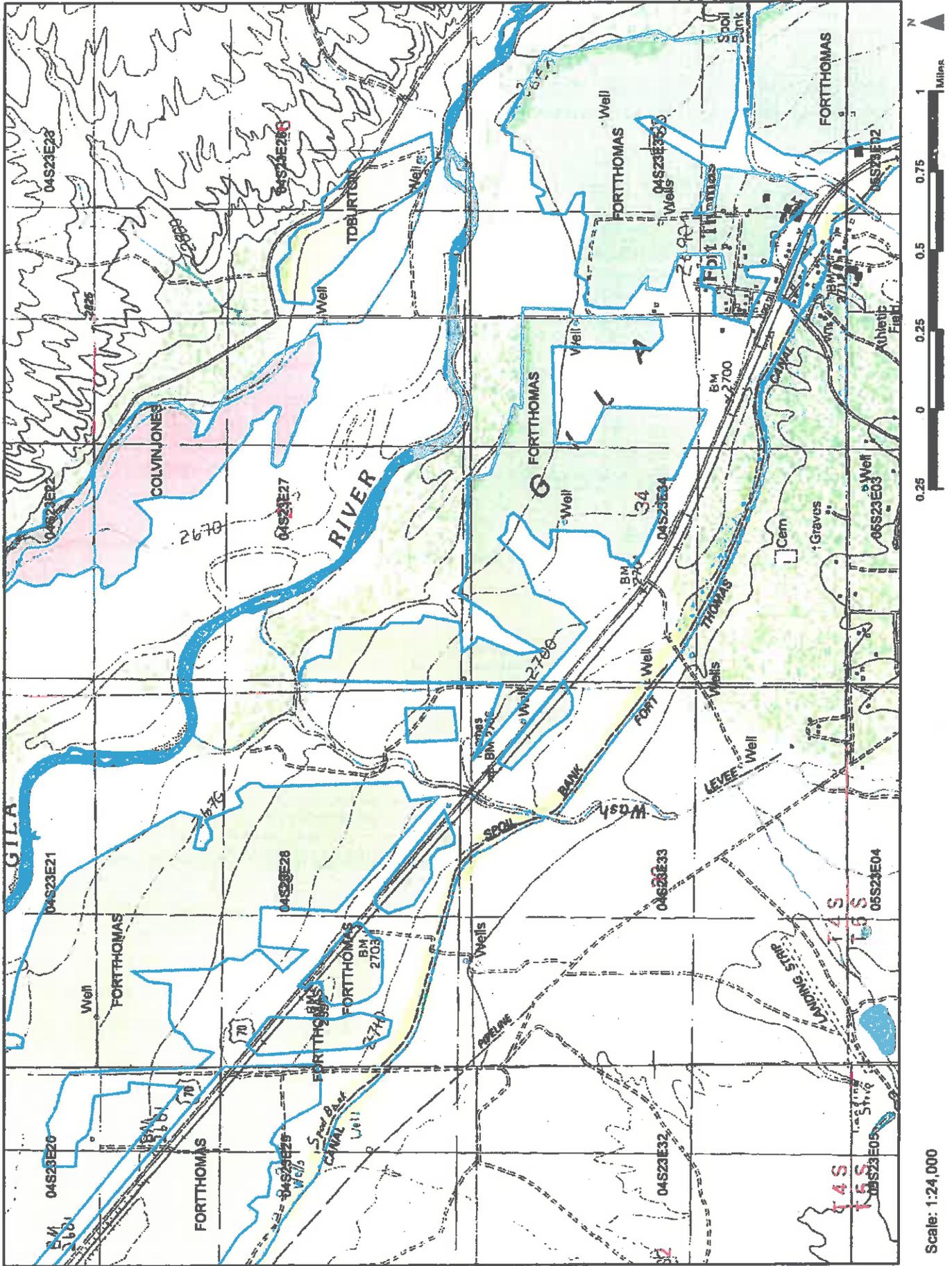
7 of 4



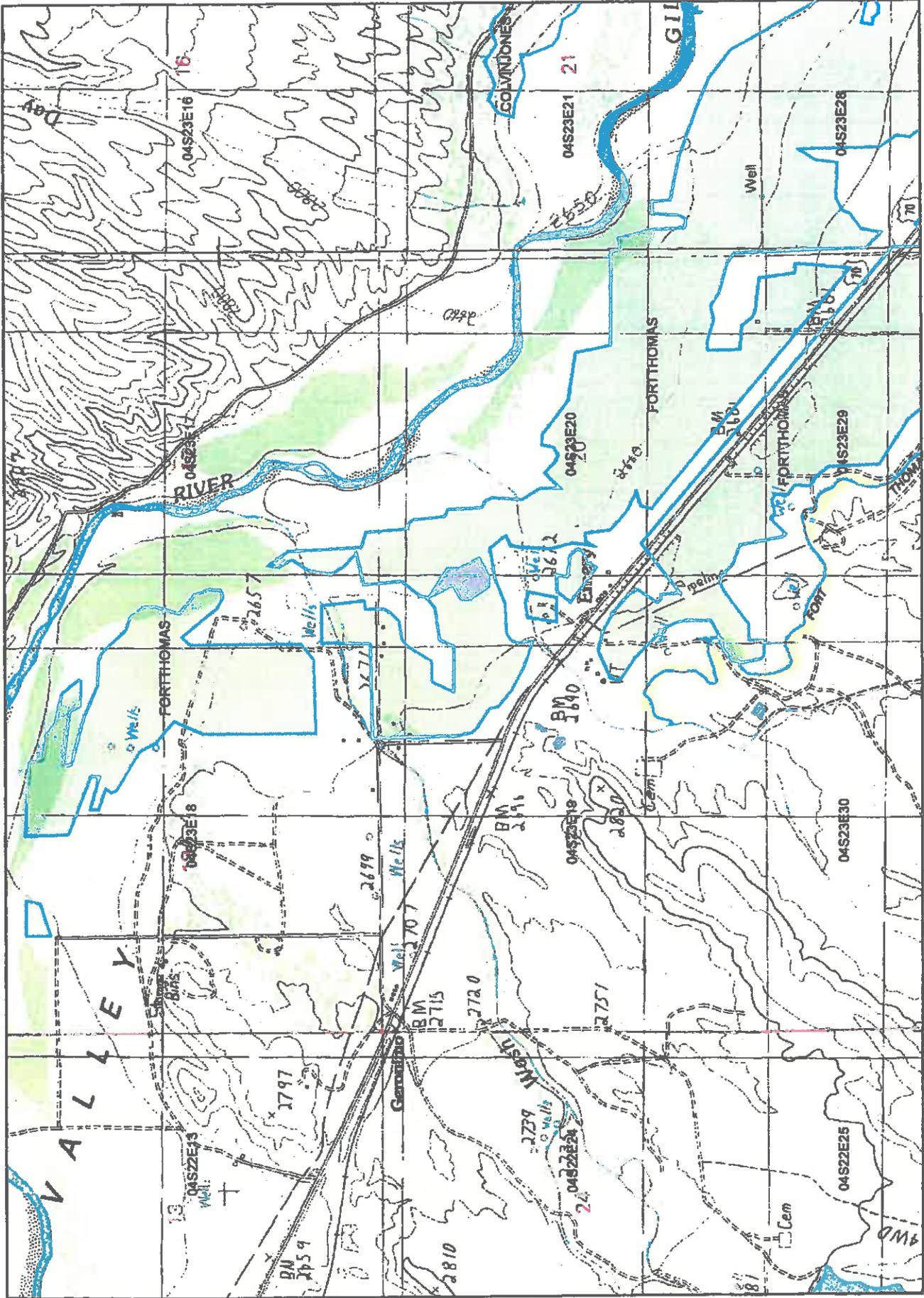


Scale: 1:24,000

FT THOMAS CANAL



FT THOMAS CANAL



Scale: 1:24,000

GRAHAM CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): Graham Canal
2566 W US HWY 70

Address: THAYER AZ 85521 T7S R26E Sec 5, 6 T6S R26E Sec 31
T6S R25E Sec 36, 25, 26, 23, 22, 15, 16, 9, 8, 7, & 6

City or Town: PIMA Vicinity County: GRAHAM Tax Parcel No.: T6S R24E Sec 1 & 2

Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: _____

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference - Zone: 12S Easting: 3021 Northing: 3642115
NAD 83

USGS 7.5' quadrangle map: 465000 PIMA

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIGATION DIST.
DEGREE MAPS

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: irrigation of farm fields
Sources: GVID * Graham Canal records

PHOTO INFORMATION

Date of photo: 8/15
View Direction (looking towards): _____

Attach a recent photograph of property in this space. Additional photographs may be appended.

typical canal aspect photo attached

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS – Describe any historic events/trends associated with the property: UNK

B. PERSONS – List and describe persons with an important association with the building: UNK

C. ARCHITECTURE – Style: _____ no style

Stories: _____ Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: UNK

MATERIALS

Describe the materials used in the following elements of the property: DIRT CANAL

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: rural, agrarian

How has the environment changed since the property was constructed? UNK

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: _____

NATIONAL REGISTER STATUS (if listed, check the appropriate box) NOT LISTED
 Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

Property is is not eligible individually.

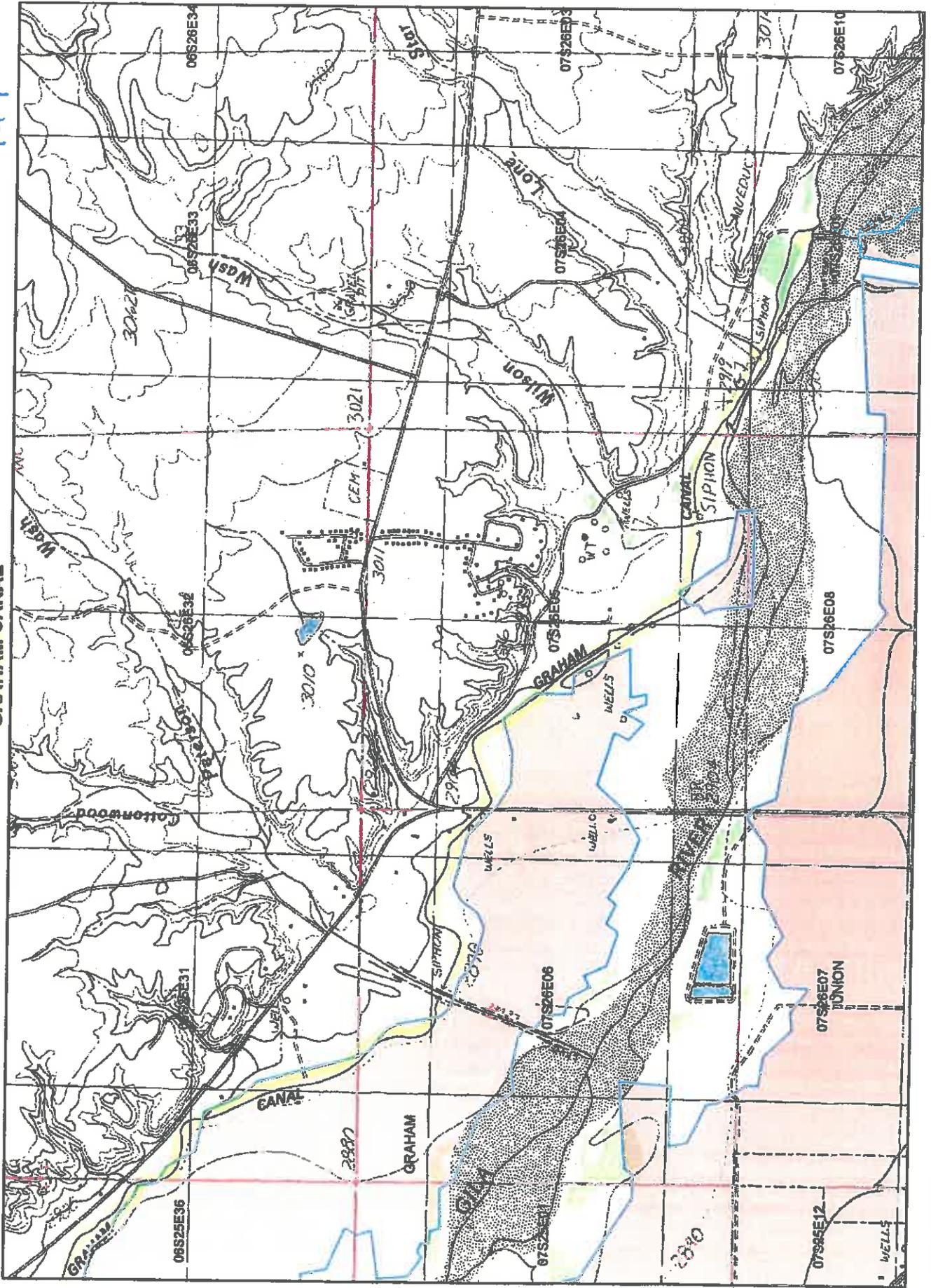
Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

If not considered eligible, state reason: _____

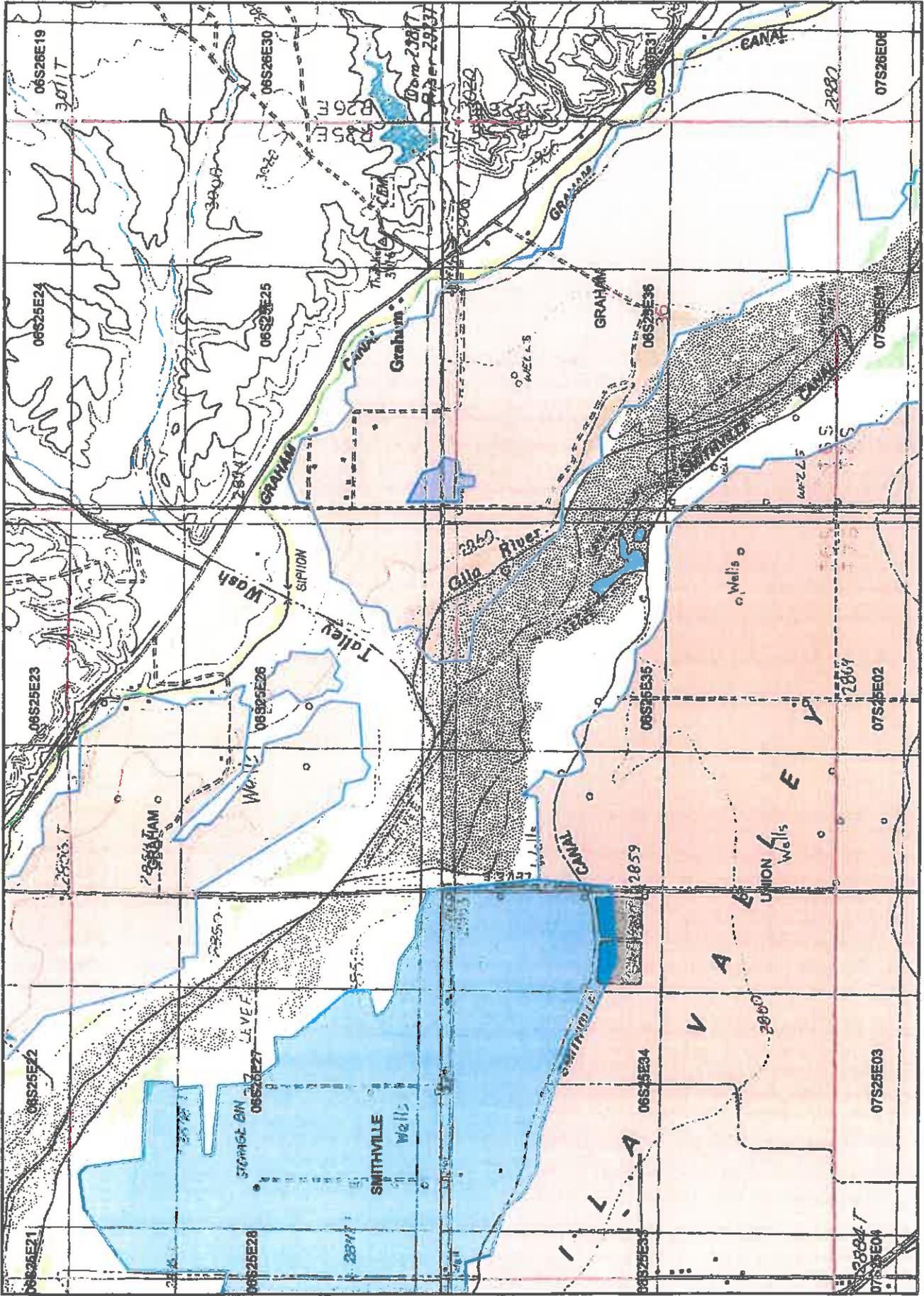
1917

GRAHAM CANAL



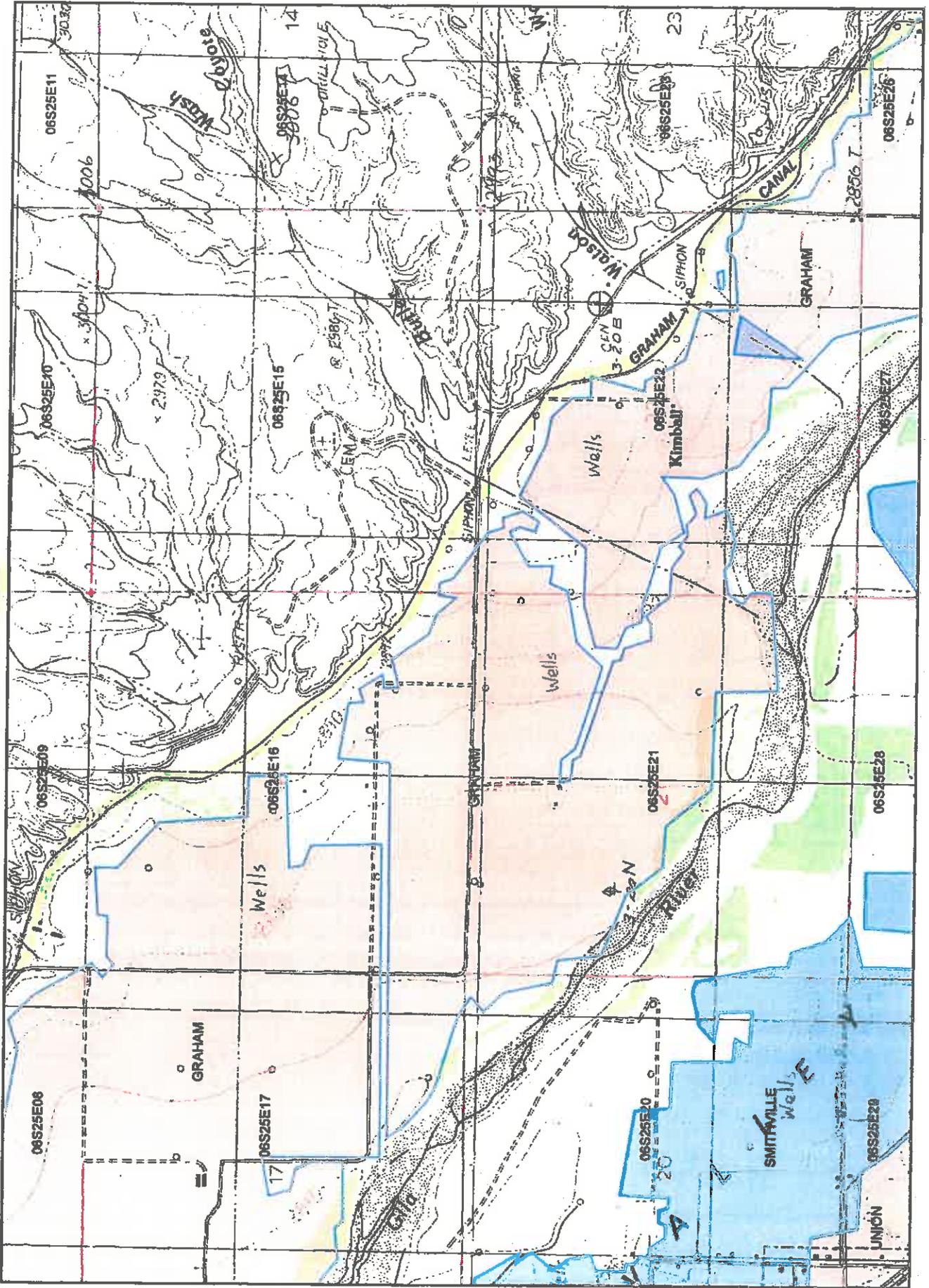
Scale: 1:24,000

GRAHAM CANAL



Scale: 1:24,000

GRAHAM CANAL



Scale: 1:24,000

HIGHLINE CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): Highline Canal

2586 W US HWY 70 T7S R26E S4C 20, 19, 25, 26, 27, 28
Address: THATCHER AZ 85552 T7S R25E S4C 24, 13, 14, 11 & 10

City or Town: SAFFORD Vicinity County: GRAHAM Tax Parcel No.: _____

Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: _____

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference - Zone: 12S Easting: 619988 Northing: 3631380 (approx. midpoint)
NAD 83

USGS 7.5' quadrangle map: SAFFORD & THATCHER

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIG. DISTRICT (GVID)
HIGHLINE CANAL CO.

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: Irrigating farm ground
Sources: GVID & Highline Canal Co.

Attach a recent photograph of property in this space. Additional photographs may be appended.

Typical canal photo attached

PHOTO INFORMATION

Date of photo: 8/15
View Direction (looking towards): _____

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS - Describe any historic events/trends associated with the property: UNK

B. PERSONS - List and describe persons with an important association with the building: UNK

C. ARCHITECTURE - Style: _____ no style

Stories: _____ Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: UNK

MATERIALS

Describe the materials used in the following elements of the property: DIRT CANAL

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: rural, agrarian

How has the environment changed since the property was constructed? UNK

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: _____

NATIONAL REGISTER STATUS (if listed, check the appropriate box) NOT LISTED

Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

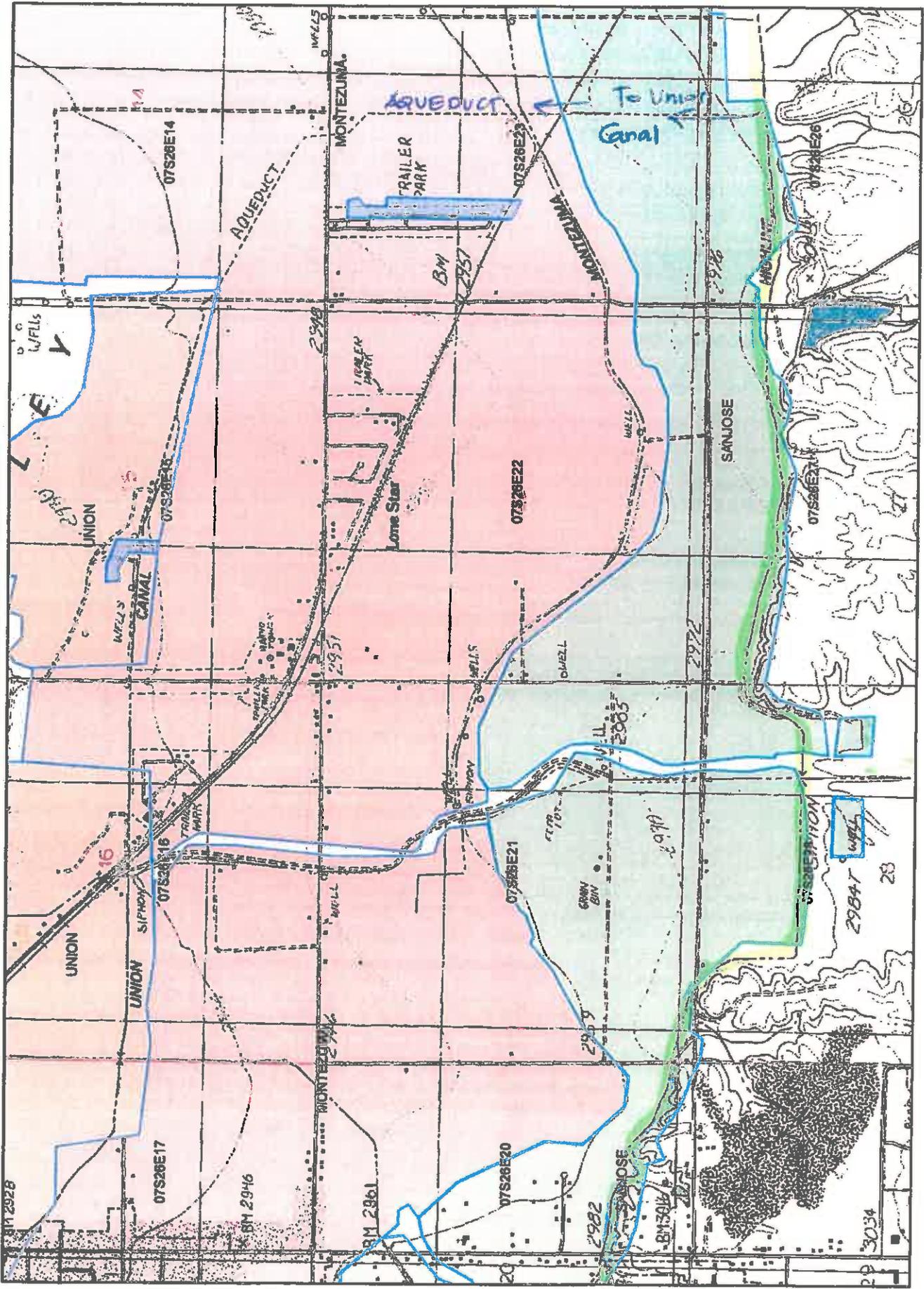
Property is is not eligible individually.

Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

If not considered eligible, state reason: _____

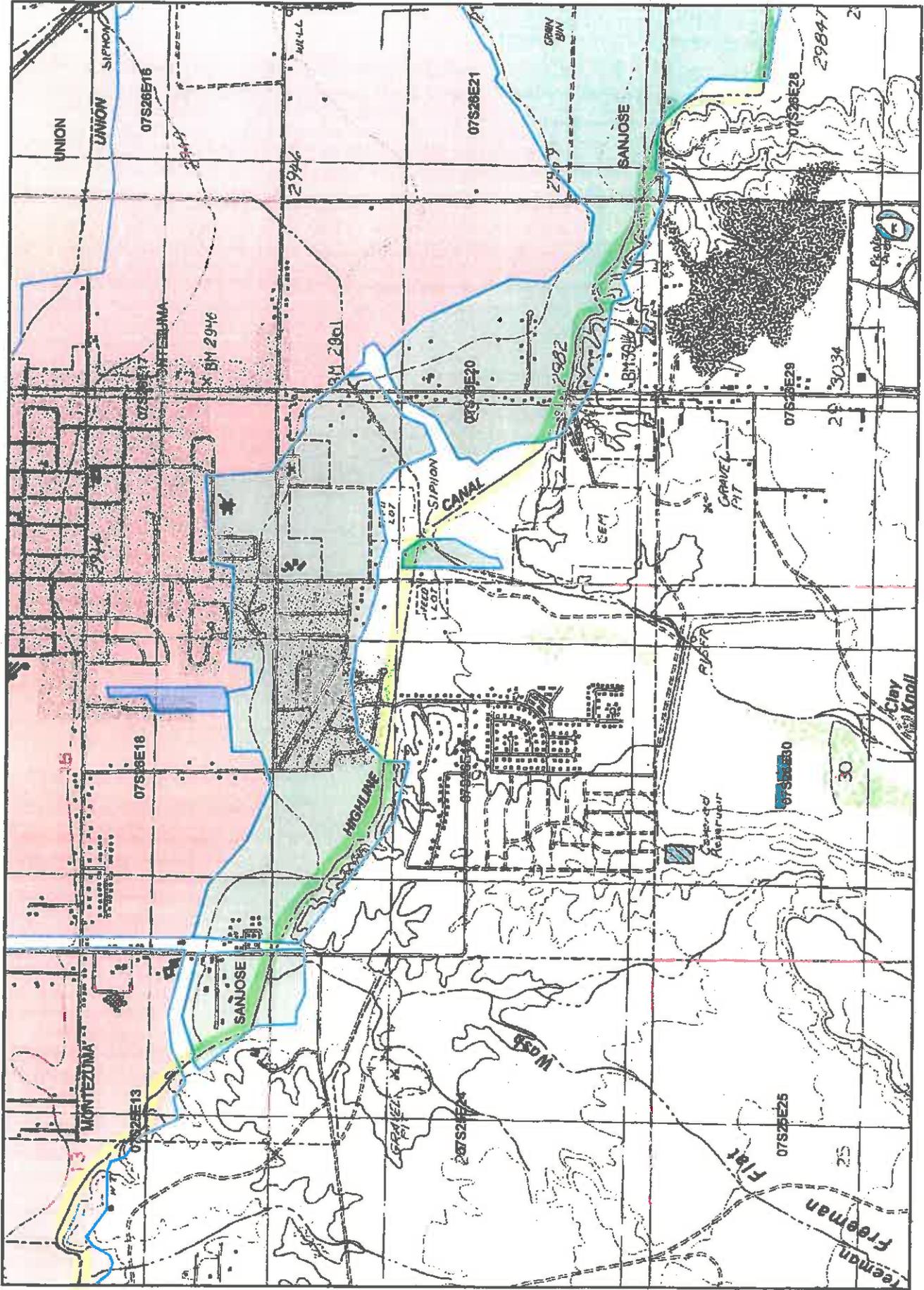
HIGHLINE CANAL



Scale: 1:24,000



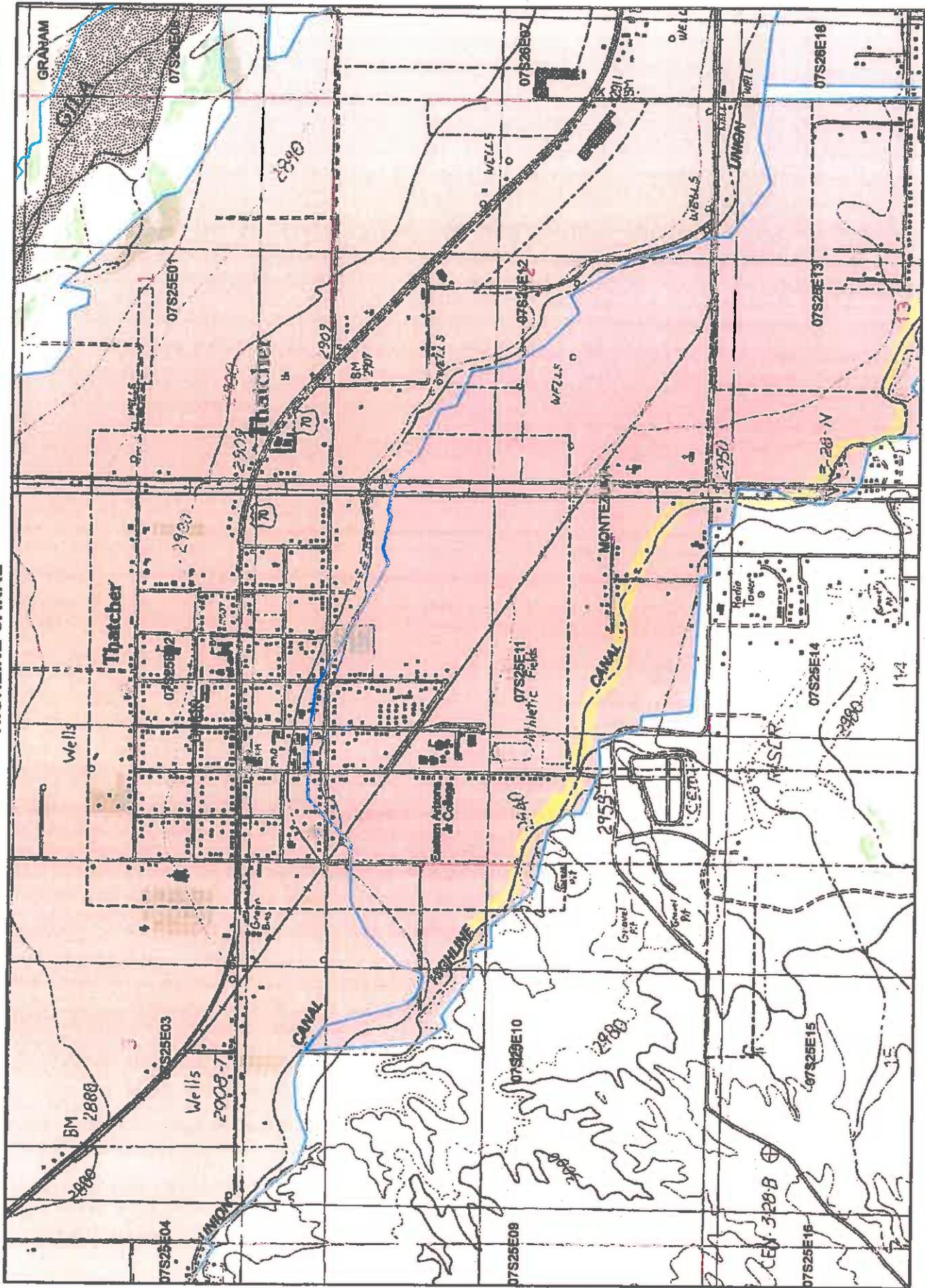
HIGHLINE CANAL



Scale: 1:24,000



HIGHLINE CANAL



Scale: 1:24,000



MONTEZUMA CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): Montezuma Canal

Address: 2500 W. US HWY 70 THATCHER AZ 85545 TTS R27E S0 18 T1S R26E S0 24, 23, 22, 21

City or Town: SAFFORD Vicinity County: GRAHAM Tax Parcel No.: _____

Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: _____

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference - Zone: 12S Easting: 624232 Northing: 3630413 (approx midpoint)
NAD 83

USGS 7.5' quadrangle map: SAN JOSE, SAFFORD

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIGATION DISTRICT DECREE MAPS

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: irrigation of farm fields
Sources: GVID & Montezuma Canal Co.

Attach a recent photograph of property in this space. Additional photographs may be appended.

typical canal photo attached

PHOTO INFORMATION

Date of photo: 9/15
View Direction (looking towards): _____

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS – Describe any historic events/trends associated with the property: unk

B. PERSONS – List and describe persons with an important association with the building: unk

C. ARCHITECTURE – Style: _____ no style

Stories: _____ Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: unk

MATERIALS

Describe the materials used in the following elements of the property: DIRT CANAL

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: rural, city (Safford, Thatcher)

How has the environment changed since the property was constructed? agrarian

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction unk

NATIONAL REGISTER STATUS (if listed, check the appropriate box) NOT LISTED

Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

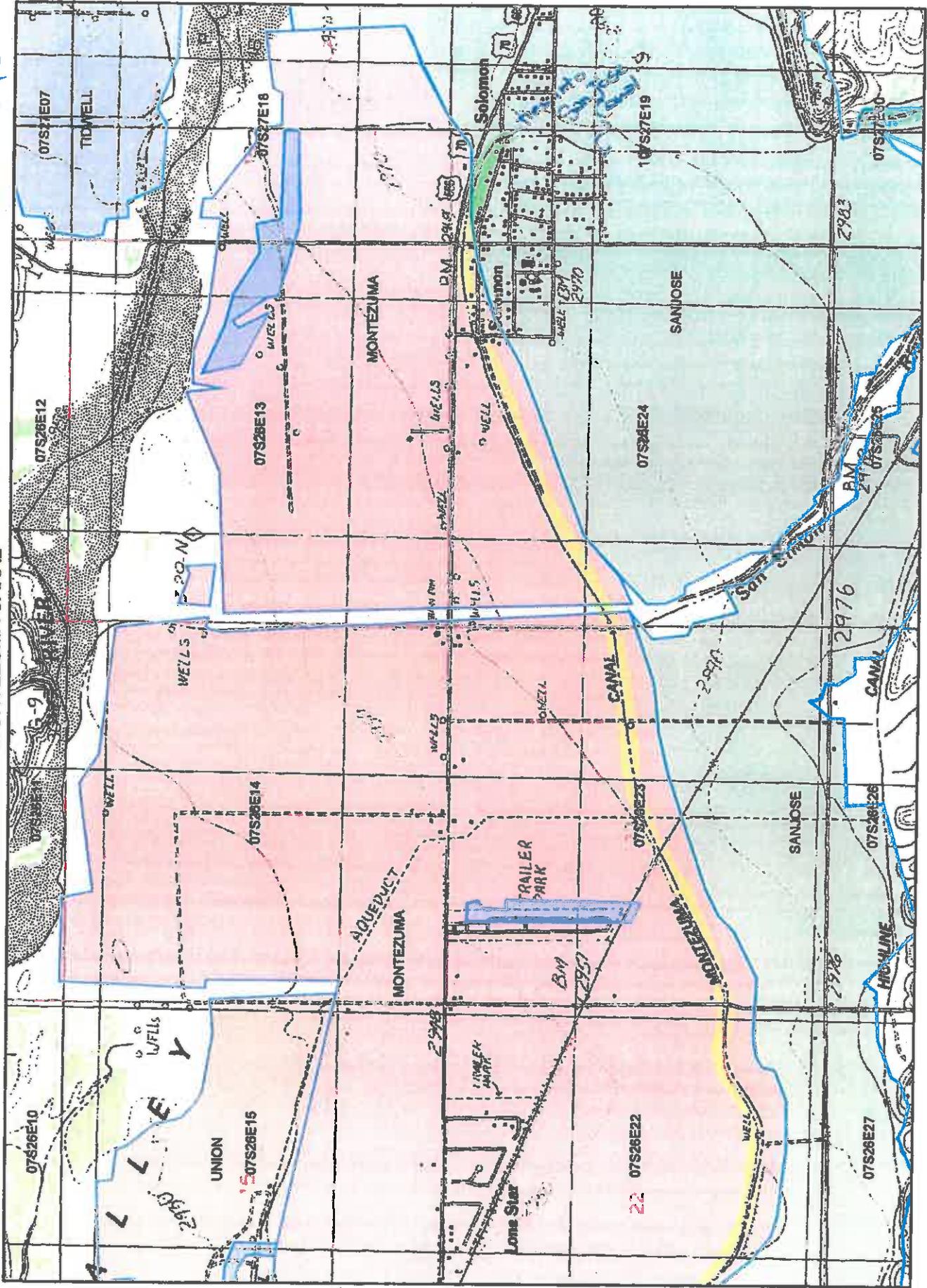
Property is is not eligible individually.

Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

If not considered eligible, state reason: _____

MONTEZUMA CANAL

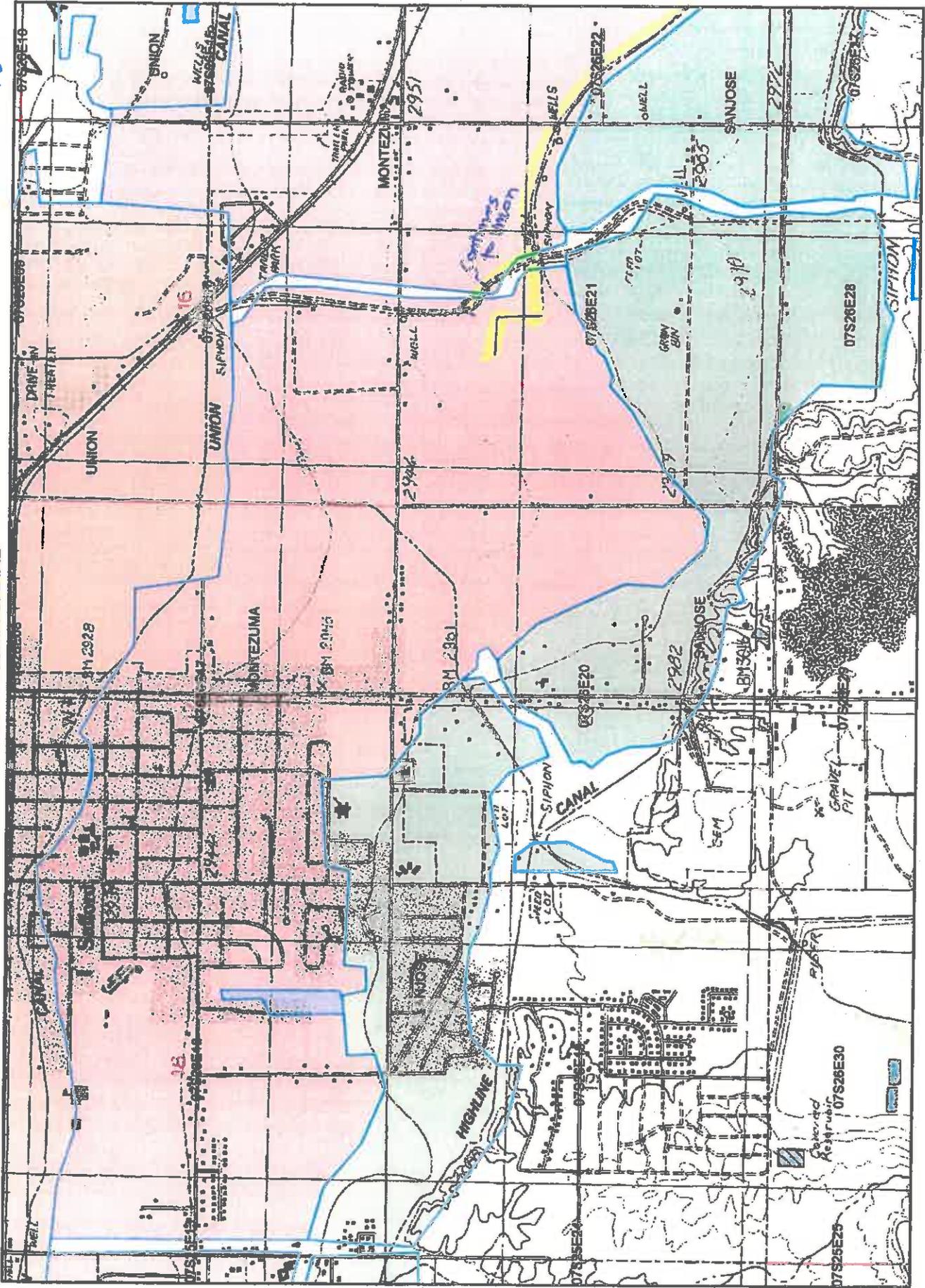


Scale: 1:24,000



MONTEZUMA CANAL

CUT C



Scale: 1:24,000

SAN JOSE CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. N/A Survey Area: N/A

Historic Names (enter the name(s), if any that best reflect the property's historic importance): San Jose Canal
2586 W VS HWY 70

Address: THATCHER AZ 85652 T1SR27E Sec 2, 3, 10, 16, 20, 19, 30

City or Town: SELWICK Vicinity County: GRAHAM Tax Parcel No.: N/A

Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: _____

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference - Zone: 12S Easting: 628081 Northing: 3629497 (approx. midpoint)
NAD 83

USGS 7.5' quadrangle map: SAN JOSE & SAFFORD

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIG. DISTRICT & DECREE MAPS

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: irrigation of farm fields
Sources: SVID
San Jose Canal Co.

PHOTO INFORMATION

Date of photo: 3/15
View Direction (looking towards): _____

Attach a recent photograph of property in this space. Additional photographs may be appended.

Typical canal photo attached

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS - Describe any historic events/trends associated with the property: unk

B. PERSONS - List and describe persons with an important association with the building: unk

C. ARCHITECTURE - Style: _____ no style

Stories: _____ Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: unk

MATERIALS

Describe the materials used in the following elements of the property: DIFI (CANAL)

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: rural, town (Solomon), agrarian

How has the environment changed since the property was constructed? unk

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: unk

NATIONAL REGISTER STATUS (if listed, check the appropriate box) NOT LISTED
 Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

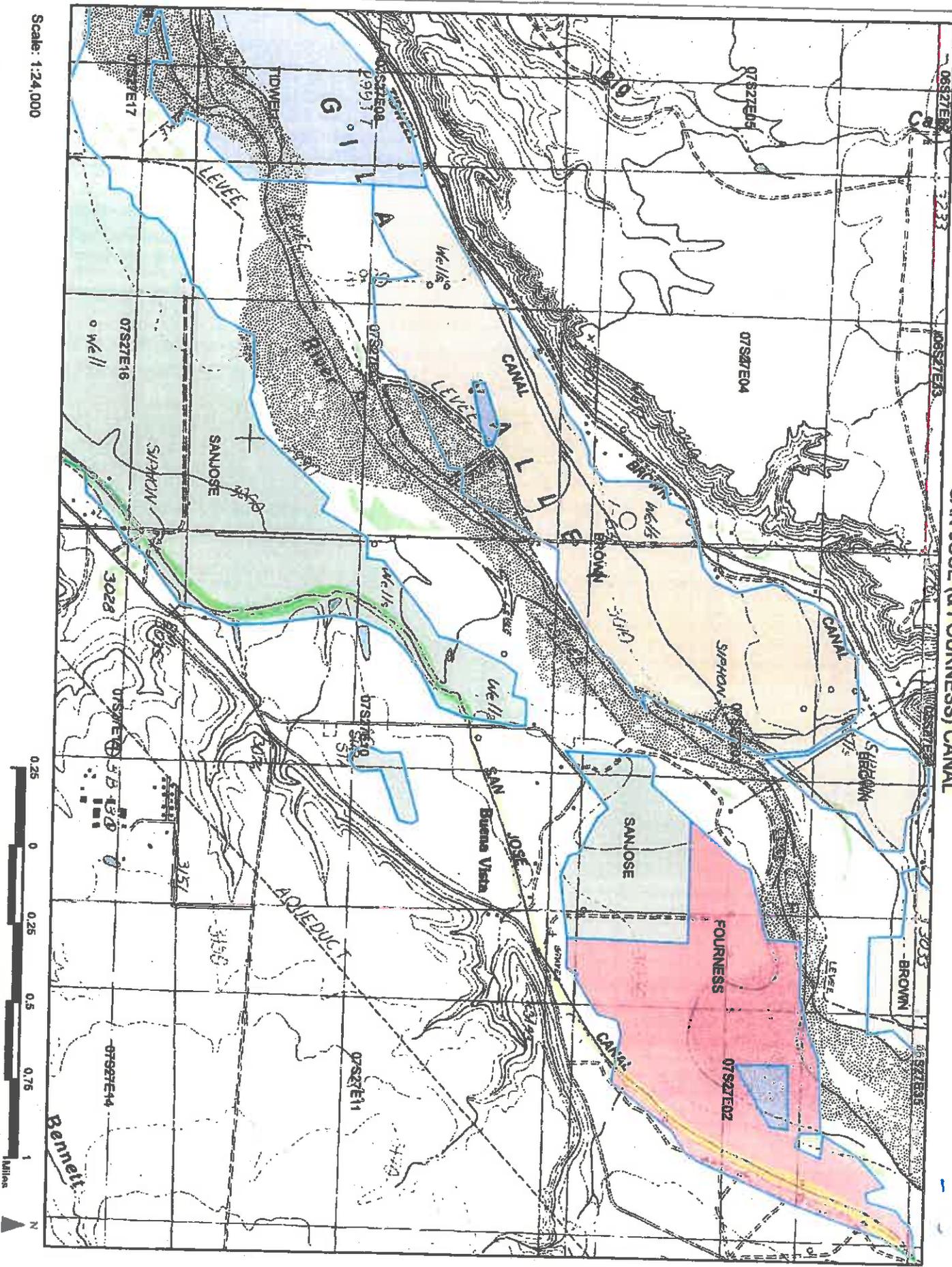
Property is is not eligible individually.

Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

If not considered eligible, state reason: _____

SAN JOSE (& FOURNESS) CANAL



Scale: 1:24,000



SMITHVILLE CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): SMITHVILLE CANAL
2586 W US HWY 70

Address: THATCHER AZ 85562 T6S R25E S4 27, 28, 29, 19, 30,
T6S R24E S4 24, 13, 14, 15 & 16

City or Town: _____ Vicinity County: GILA Tax Parcel No.: _____

Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: _____

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference - Zone: 12S Easting: 610321 Northing: 3639593 (approx. midpoint)
NAD 83

USGS 7.5' quadrangle map: PIMA & EDEN

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIGATION DISTRICT
DEGREE MAPS

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: irrigation of farm fields

Sources: SVID
Smithville Canal Co.

PHOTO INFORMATION

Date of photo: 7/15
View Direction (looking towards): _____

Attach a recent photograph of property in this space. Additional photographs may be appended.

typical canal photo attached

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS – Describe any historic events/trends associated with the property: Unk

B. PERSONS – List and describe persons with an important association with the building: Unk

C. ARCHITECTURE – Style: _____ no style

Stories: _____ Basement / Roof Form: _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: Unk

MATERIALS

Describe the materials used in the following elements of the property: DIRT CANAL

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: Town (Pima), rural, agrarian

How has the environment changed since the property was constructed? Unk

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: Unk

NATIONAL REGISTER STATUS (if listed, check the appropriate box) NOT LISTED
 Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

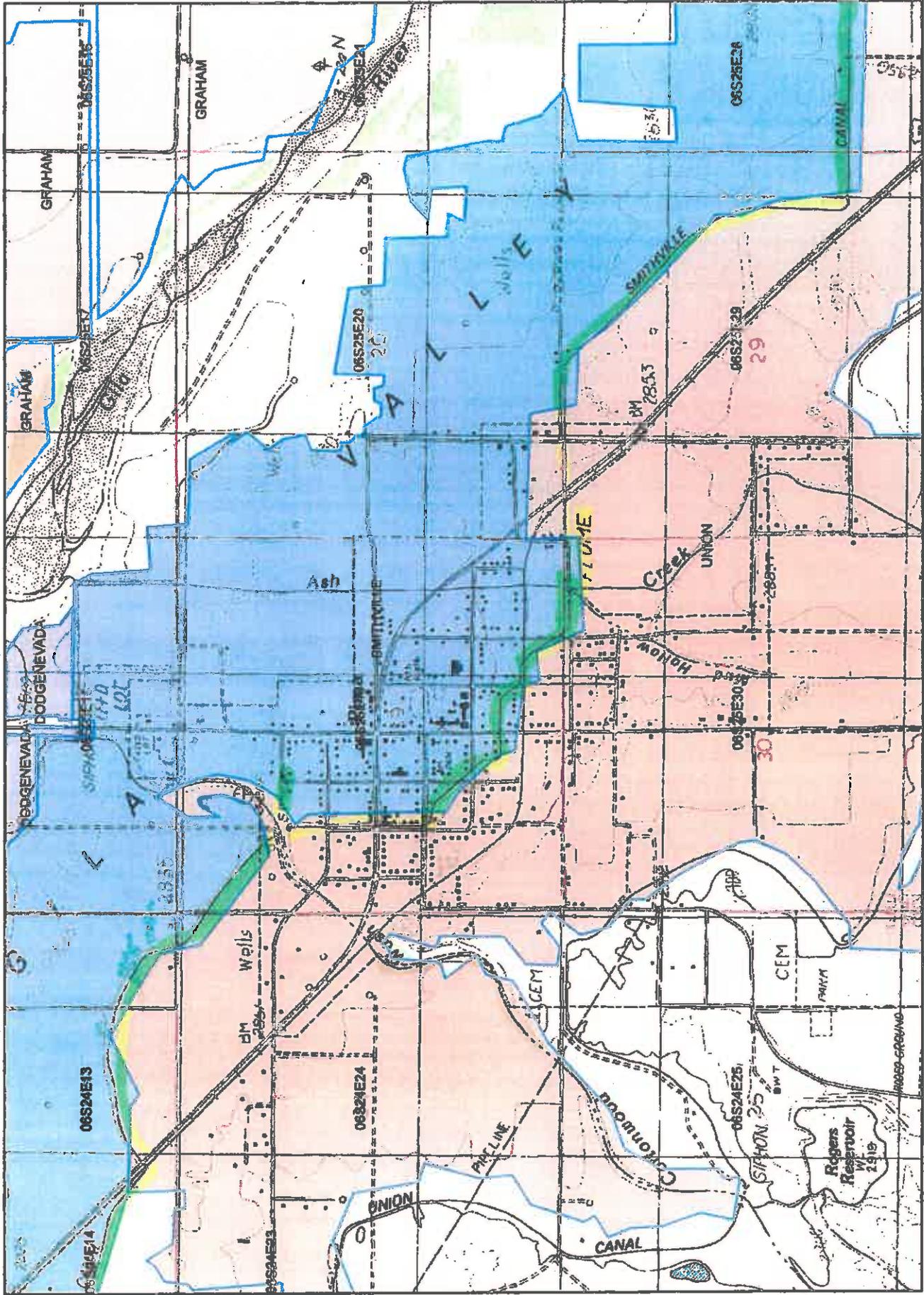
Property is is not eligible individually.

Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

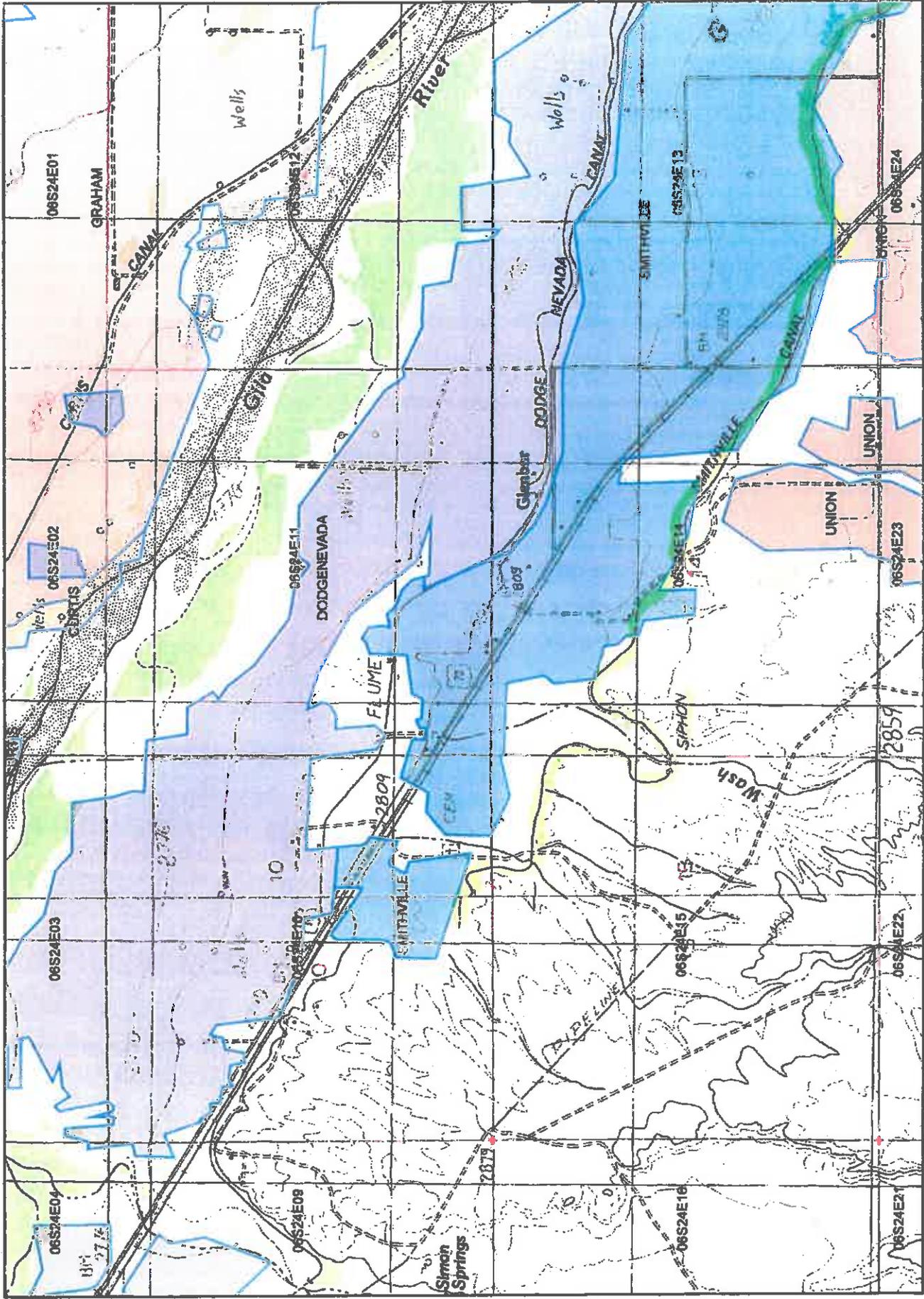
If not considered eligible, state reason: _____

SMITHVILLE CANAL



Scale: 1:24,000

SMITHVILLE CANAL



Scale: 1:24,000

UNION CANAL

STATE OF ARIZONA
HISTORIC PROPERTY INVENTORY FORM

Please type or print clearly. Fill out each applicable space accurately and with as much information as is known about the property.

PROPERTY IDENTIFICATION

For properties identified through survey: Site No. _____ Survey Area: _____

Historic Names (enter the name(s), if any that best reflect the property's historic importance): UNION CANAL

Address: 253 1/2 W US HWY 70 T7SR26E Sec 14, 15, 16, 17, 18,

HATCHER AZ 8002 T7SR25E Sec 13, 12, 2, 3, 4,
PIMA Vicinity County: SAHARA Tax Parcel No.: _____ T6SR25E Sec 33, 32, 31, 30
T6SR24E Sec 25, 24,

Township: _____ Range: _____ Section: _____ Quarters: _____ Acreage: _____ 23

Block: _____ Lot(s): _____ Plat (Addition): _____ Year of plat (addition): _____

UTM Reference - Zone: 12S Easting: 613909 Northing: 3635212
NAD 83

USGS 7.5' quadrangle map: SAFFORD, HATCHER, PIMA

ARCHITECT: _____ not determined known Source: _____

BUILDER: _____ not determined known Source: _____

CONSTRUCTION DATE: 1920's known estimated Source: GILA VALLEY IRRIG. DISTRICT - DEWEE MAPS

STRUCTURAL CONDITION

- Good (well maintained; no serious problems apparent)
- Fair (some problems apparent) Describe: _____
- Poor (major problems; imminent threat) Describe: _____
- Ruin/Uninhabitable

USES/FUNCTIONS

Describe how the property has been used over time, beginning with the original use: irrigation of farm fields

Sources: GVD
UNION CANAL Co.

PHOTO INFORMATION

Date of photo: 8/15
View Direction (looking towards): _____

Attach a recent photograph of property in this space. Additional photographs may be appended.

typical canal aspect photo attached

SIGNIFICANCE

To be eligible for the National Register, a property must represent an important part of the history or architecture of an area. The significance of a property is evaluated within its historic context, which are those patterns, themes, or trends in history by which a property occurred or gained importance. Describe the historic and architectural contexts of the property that may make it worthy of preservation.

A. HISTORIC EVENTS/TRENDS – Describe any historic events/trends associated with the property: unk

B. PERSONS – List and describe persons with an important association with the building: unk

C. ARCHITECTURE – Style: _____ no style

Stories: _____ Basement Roof Form: _____

Describe other character-defining features of its massing, size and scale: _____

INTEGRITY

To be eligible for the National Register, a property must have integrity (i.e. it must be able to visually convey its importance). The outline below lists some important aspects of integrity. Fill in the blanks with as detailed a description of the property as possible.

Location - Original Site Moved: Date: _____ Original Site: _____

DESIGN

Describe alterations from the original design, including dates: unk

MATERIALS

Describe the materials used in the following elements of the property: DIET CANAL

Walls (structure): _____

Walls (sheathing): _____

Windows: _____

Roof: _____

Foundation: _____

SETTING

Describe the natural and/or built environment around the property: rural, towns (Hather/Pima), agrarian

How has the environment changed since the property was constructed? unk

WORKMANSHIP

Describe the distinctive elements, if any, of craftsmanship or method of construction: na

NATIONAL REGISTER STATUS (if listed, check the appropriate box) NOT LISTED

Individually Listed; Contributor; Non-contributor to _____ Historic District

Date Listed: _____ Determined eligible by Keeper of National Register (date: _____)

RECOMMENDATIONS ON NATIONAL REGISTER ELIGIBILITY (opinion of SHPO staff or survey consultant)

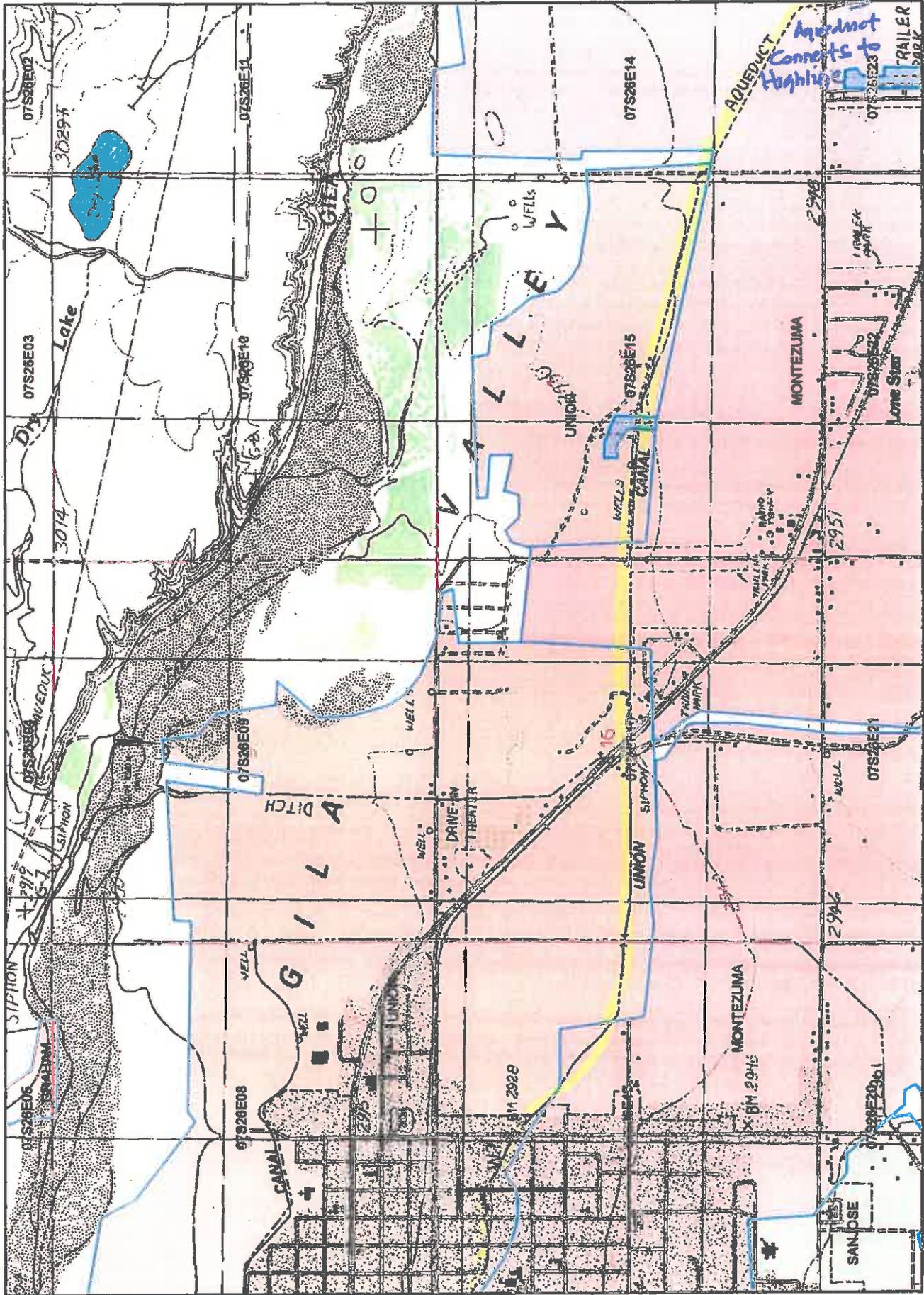
Property is is not eligible individually.

Property is is not eligible as a contributor to a listed or potential historic district.

More information needed to evaluate.

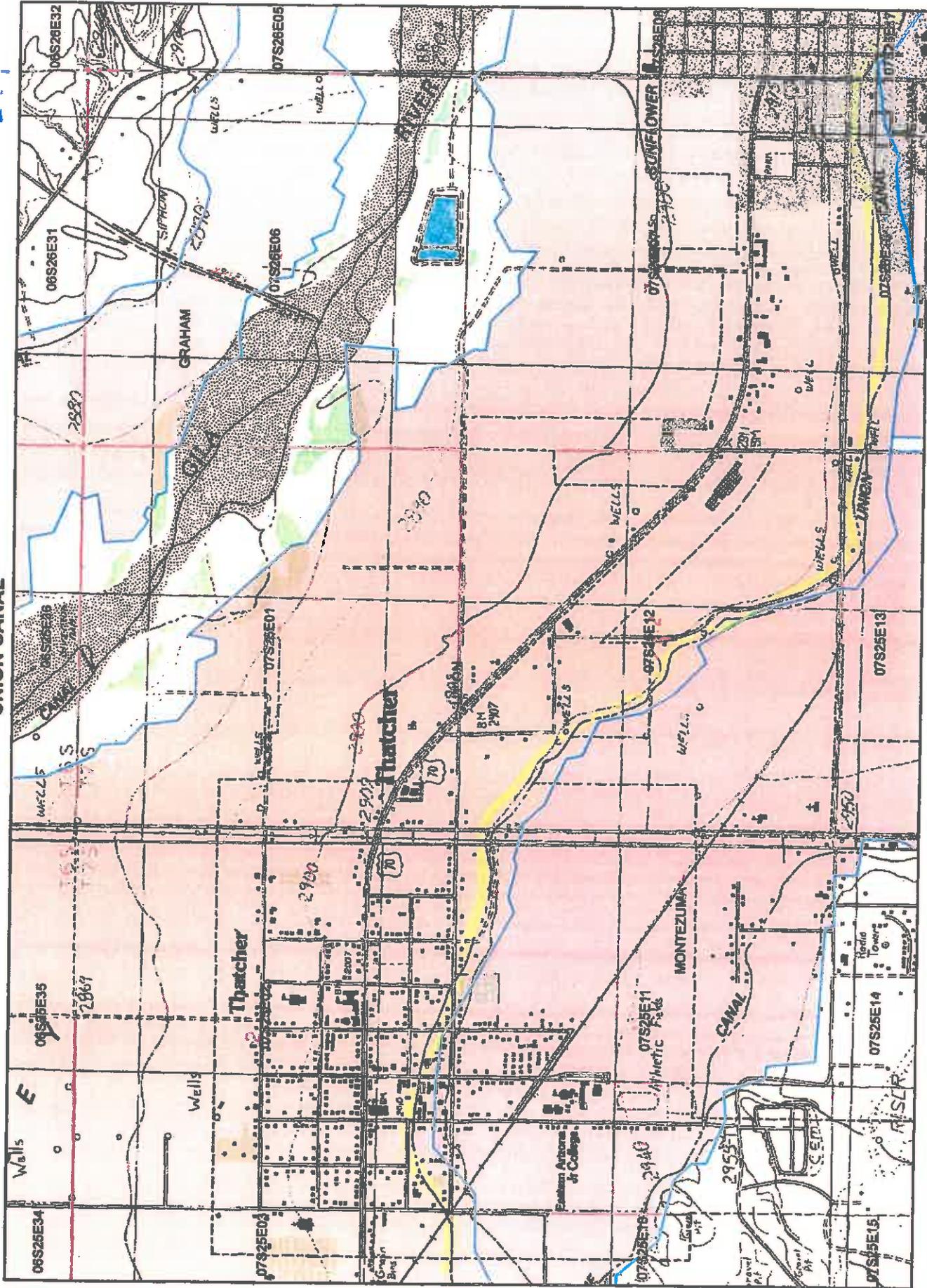
If not considered eligible, state reason: _____

UNION CANAL



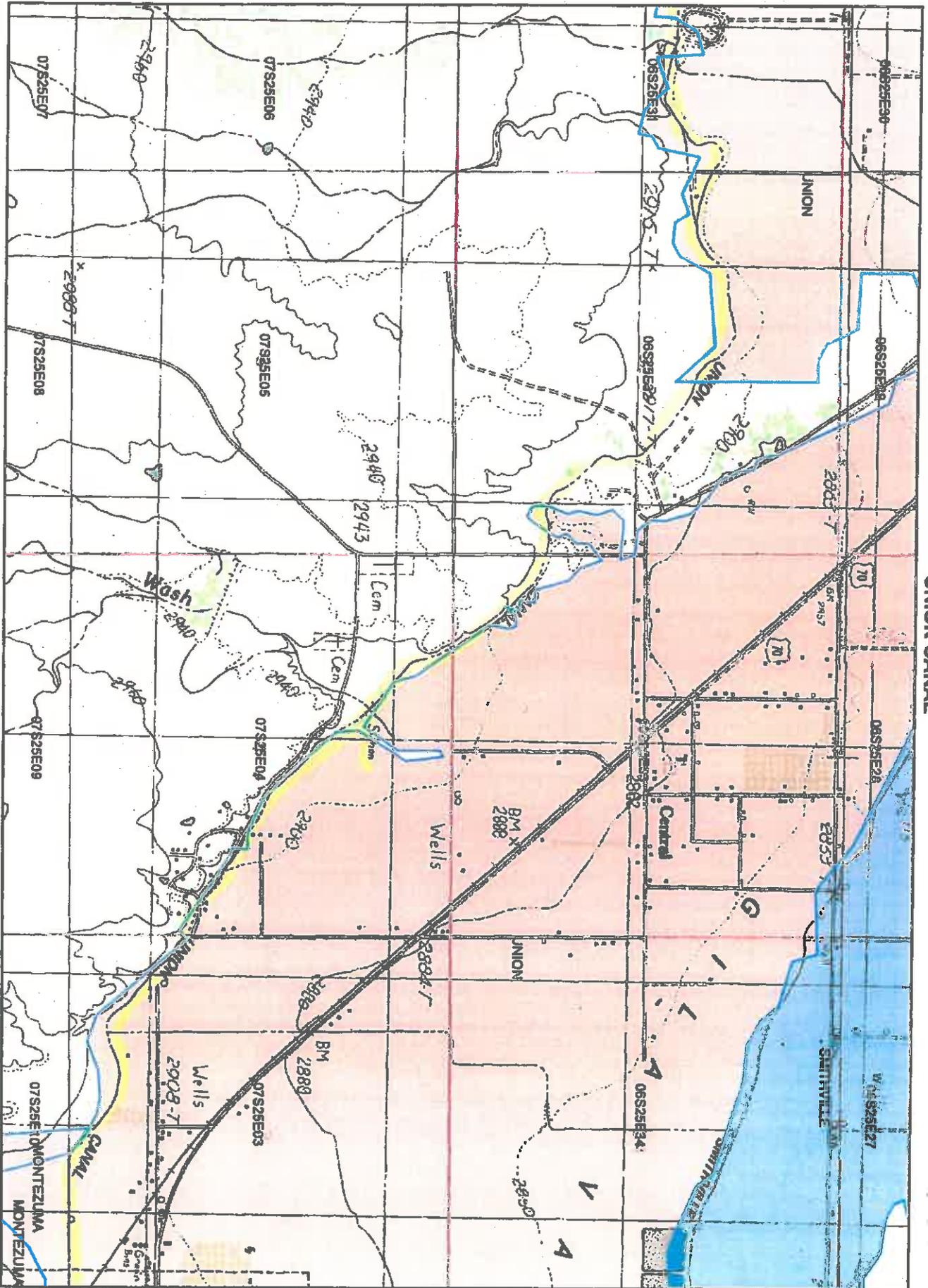
Scale: 1:24,000

UNION CANAL



Scale: 1:24,000

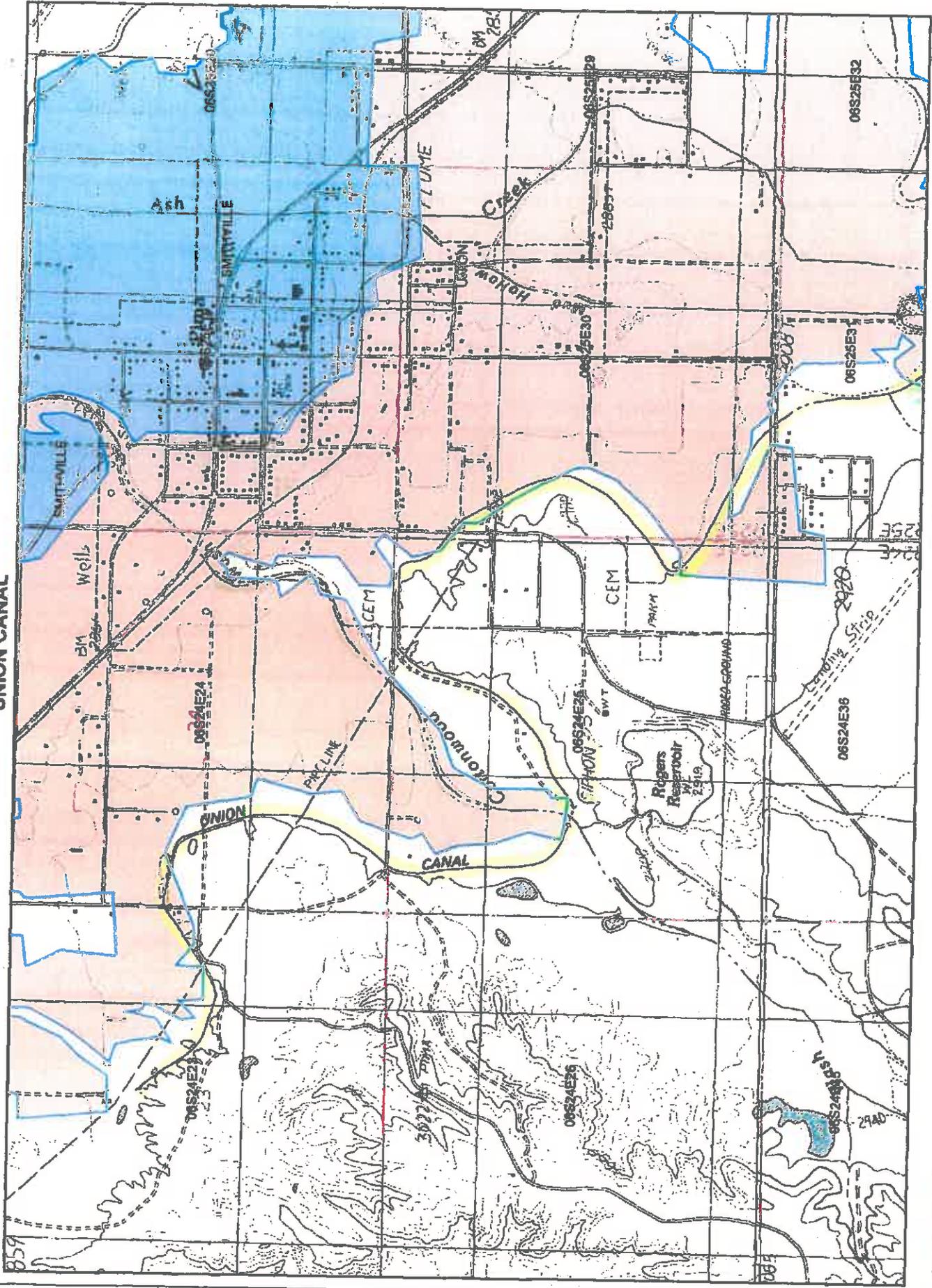
UNION CANAL



Scale: 1:24,000



UNION CANAL



Scale: 1:24,000



Key Personnel & Justification for using contractor outside of AZ

Scott Alder of the Gila Valley Irrigation District will assist the project manager with oversight and coordination of the project.

Justin Layton will serve as project manager for the duration of the project. The project manager will provide project oversight and ensure that project tasks and deliverables are completed in an accurate and timely manner.

Sam Daley, President of the Union Canal, will provide assistance to the GVID with project coordination

Amy Herbert with the Gila Valley Natural Resource Conservation District (GVNRCD) will provide administrative assistance for the project. The administrative assistant will assist with grant tracking, help compile historical information for CalPoly and ensure that all grant reports and fiscal reporting is completed in an accurate and timely manner.

CalPoly ITRC will be contracted to develop and complete the Rapid Appraisal. The ITRC Rapid Appraisal Process (RAP) for irrigation projects was created in 1989 as a tool to quickly provide valuable insight into many aspects of irrigation performance including project design, engineering, operations and management. ITRC has performed hundreds of appraisals for water districts and agencies throughout the western states, as well as for the Food and Agriculture Organization of the United Nations and the World Bank projects in over ten countries, including Pakistan, the Philippines, India, Mexico, Vietnam, and China. GVID requested proposals/bids from local and in-state groups for the assessment. The bids were considerably over what CalPoly has quoted. In addition, the scope of work, and proposals for assessment were not as comprehensive. Nor did the entities have the years of knowledge and reputation behind them. We feel that in dealing with an entity like CalPoly ITRC that has a huge knowledge base and regularly does rapid assessments we will be receiving the best value for money spent.

THE ITRC RAPID APPRAISAL PROCESS (RAP) FOR IRRIGATION DISTRICTS

Stuart Styles¹
Charles Burt²

ABSTRACT

The ITRC Rapid Appraisal Process (RAP) for irrigation projects was created in 1989 as a tool to quickly provide valuable insight into many aspects of irrigation performance including project design, engineering, operations and management. The RAP is a 2-week process of collection and analysis of data both in the office and in the field. The process examines external inputs such as water supplies, and outputs such as water destinations, and provides a systematic examination of the hardware and processes used to convey and distribute water internally to all levels within the project (from the source to the fields). The organization and content of the RAP provides a systematic project review that enables an evaluator to provide pragmatic recommendations related to hardware and management for the improvement of water delivery service.

INTRODUCTION

The Irrigation Training and Research Center (ITRC), California Polytechnic State University, San Luis Obispo, is actively involved with finding solutions to improve irrigation performance. ITRC has a history of over 20 years of working with irrigation districts and agricultural water users to develop, implement and monitor strategies for improving irrigation performance.

Since 1989, ITRC has pioneered work on the Rapid Appraisal Process (RAP) for distribution systems for irrigation projects. In general, the RAP is a quick and focused examination of irrigation systems and projects that can give a reasonably accurate and pragmatic description of the status of irrigation performance, and provide a basis for making specific recommendations related to hardware and management practices.

An RAP is designed to:

- Identify specific and immediate actions that could be easily taken, with a minimum of investment, to improve operation and water management

¹ Director, Irrigation Training and Research Center (ITRC), BioResource and Agricultural Engineering Department, California Polytechnic State University (Cal Poly), San Luis Obispo, CA 93407

² Chairman, ITRC

- Quickly critique options that have been proposed for major future investment
- Provide a fresh look at the whole system, with the goal of being able to provide suggestions for new ways to improve the overall irrigation distribution system

This paper will focus on the RAP approach applied to irrigation districts, and will discuss how and why the RAP was created, what the necessary components are for a successful appraisal, and why the ITRC RAP is unique in its thoroughness and effectiveness.

HISTORY OF THE RAP

The RAP was initially developed as a set of recommendation-orientated irrigation system evaluation procedures for different on-farm irrigation methods. In 1983, ITRC began to develop standardized procedures for evaluating on-farm irrigation systems with support from the Water Conservation Office, California Department of Water Resources (WCO/DWR). The result was the Cal Poly ITRC on-farm irrigation system manual and software package that has become the standard for field evaluations in the Western U.S. (Burt et al. 1995).

The Rapid Appraisal Process was designed in 1989 out of the techniques used for the irrigation evaluations. ITRC has successfully used variations of the RAP approach as a diagnostic and research tool in a wide variety of situations both in the U.S. and internationally (Burt et al. 1996, Burt and Styles 1999, Burt and Styles 2000).

The use of a systematic RAP for irrigation projects was introduced in a joint FAO/IPTRID/World Bank publication entitled *Water Reports 19 (FAO) – Modern Water Control and Management Practices in Irrigation – Impact on Performance* (Burt and Styles 1999). That publication provides an explanation of the RAP approach and gives the results from RAPs the authors conducted at 16 international irrigation projects. Refer to Water Reports 19 for further background to the RAP approach, available directly from FAO (<http://www.fao.org/icatalog/inter-e.htm>).

OBJECTIVES

The first step in evaluating irrigation performance, whether at the farm level or an entire irrigation district, is to perform a rapid appraisal of the system as it is being operated. In typical project evaluations, a common error is that there is no daily operational strategy for moving water around in the system that relates to the detailed engineering recommendations.

It is essential that hardware or automation recommendations be linked to such an operation plan and strategy if the investment is to provide maximum benefits. When this is not done properly (as in many cases), it is almost inevitable that the wrong types and sizes of structures are installed, and key regulation and operation structures are overlooked. Further, it is critical that recommendations to irrigation districts keep in mind the economic reality of irrigated crop production. Expensive structures and computerized automation systems may look nice but may have little or no impact on the level of water delivery service provided to farmers.

The RAP approach allows ITRC to assist irrigation districts and agricultural water users in quickly identifying and prioritizing the specific changes in their water management practices that will provide cost-effective improvements in the performance of their distribution systems. Many times irrigation districts are aware of the potential to improve their operations, but they lack the knowledge or experience with current water control and measurement technologies. An irrigation district will have distinct hydrologic, engineering, operational and agronomic conditions, in addition to a history based on local agricultural practices, which will affect its ability to meet specific performance objectives. Moreover, some districts may not even be aware of the appropriate ways of thinking about performance in terms of service to farmers and water conservation.

A key component of the successful application of the RAP approach is the knowledge and experience of qualified technical experts that can make proper design and modernization decisions. It is critical that RAPs be conducted by irrigation professionals with an extensive understanding of the issues related to irrigation water control. In addition to making proper recommendations for modernization, evaluators using the RAP approach must have the ability to synthesize the technical details of a project with the concepts of water delivery service into a functional design that is easy to use and efficient.

PROCEDURE

As a center of irrigation excellence with state-of-the-art facilities, ITRC is able to work with irrigation districts in assessing the potential for improvement in their operations and then provide support and training for personnel through technical assistance programs. The RAP is the first step in accomplishing these goals.

The RAP can generally be completed with two weeks or less of field and office work. The process involves a pre-site visit survey sent to the district, followed by 1-2 days of field time by key ITRC personnel to visit the irrigation district to meet with district personnel, collect available data, and visit major structures in the system. Additional time, usually 2-3 days, is required to develop specific engineering recommendations for items such as Supervisory Control and Data Acquisition Systems (SCADA), flow measurement or canal gate automation techniques, design of water control structures, etc.

Survey Questions

A key to evaluating the distribution system for an irrigation district is to target the key factors that influence the performance of the structures and operational procedures used to convey and distribute irrigation water. One begins the RAP with a prior request for information from the irrigation district. Information such as crop types, irrigated acreages, flow rates into the system, weather data, budgets, staffing levels, existing water conservation programs, and pumping records can be assembled beforehand and then reviewed by the evaluator and project managers during a site visit to the project.

ITRC has been involved with water conservation projects and modernization programs at dozens of irrigation districts in the Western U.S. A library of information about each district is maintained and updated to reflect ongoing technical assistance programs.

The following is a general outline of the issues that need to be addressed before a set of recommendations can be made:

General Irrigation District Characteristics

- General Project Conditions
- Reservoirs
- Drainage
- Groundwater
- Crops
- Water Supply
- Water Use

Irrigation District Operations

- Water Delivery System Characteristics (Main and Lateral Canals)
- Flexibility- Frequency
- Flexibility- Flow Rate
- Flexibility- Duration
- Flexibility from Water Suppliers
- Flow Measurement at Farm Turnouts
- Facilities and Upgrades

Irrigation District and Farm Economics

- District-Level Economics
- Water Billing
- Farm Economics

Status and Needs of Modernization Programs

- Water Delivery Service

- On-Farm Improvements
- Canal Improvements
- Water Conservation Programs
- SCADA
- Training and Education

Site Visit

Upon arriving at the project, the data gathered through the survey is organized and project managers are interviewed regarding missing information and their stated perceptions of how the project functions. The evaluator then travels down and through the canal network, talking to operators and farmers, and observing and recording the actual methods of operation and hardware that are used for water control. Through this systematic diagnosis of the project, many aspects of engineering and operation become very apparent.

Interpretation of RAP Results

The RAP, by itself, is only a diagnostic tool. It allows a qualified evaluator to systematically examine the irrigation project. Through FAO and World Bank funding, the authors have developed a set of EXCEL spreadsheets with two characteristics:

1. Several hundred questions are provided that evaluators must answer in a standardized format. Questions cover topics such as water supply, personnel management, canal structures, level of water delivery service throughout the project, and numerous related topics.
2. The values of a large set of external and internal indicators are automatically computed. The automatic computations provide rapid results and also eliminate computation errors.

External indicators are expressions of various forms of efficiency, whether the efficiency is related to budgets, water, or crops yields. They only require knowledge of inputs and outputs to the project – but by themselves they do not provide any insight into what must be done to improve performance. Traditional irrigation project investment decisions are based on these indicators. Internal indicators examine the hardware and processes that are used to actually move, sell, and schedule water throughout the project on an hourly, daily, and seasonal basis. (Burt and Styles 2003)

The interpretation of the results requires one or more irrigation specialists who clearly understand the options for modernization. Without a thorough knowledge of these options, the recommendations can be ineffective or damaging.

For example, a very common mistake in modernization plans is the elimination of first-time losses with the belief that this will improve project irrigation efficiencies—even though those first time losses may already be recirculated within the project. If this is the case, there may not be any true water conservation.

In general, the process of interpretation involves the examination and review of the following six components:

1. Field irrigation efficiencies
2. Project irrigation efficiencies
3. Conveyance efficiencies (compared against field irrigation efficiencies)
4. The attributes of water delivery service
5. The appropriateness of hardware and operator instruction
6. The existence of recirculation systems

The process of implementation is as follows:

1. A first step is to eliminate any discrepancy between “actual” and “stated” service. Some project managers do not fully understand that there even is a discrepancy.
2. Frequently, the instructions that are given to operators need modification. Sometimes, these modifications are simple and result in significantly improved operations.
3. The next steps, more or less in order of sequence, are to improve the following areas:
 - a. Understanding of what actually happens in the system. An expert can quickly evaluate a project and because of his or her background, almost immediately understand cause/effect relationships and the probable level of service.
 - b. Communications at all levels. This starts with human-human communications – often with radios or cell phones.
 - c. Mobility of staff. In general, a small yet mobile staff is much more efficient than a large, immobile staff.

- d. Flow rate control and measurement at key bifurcation (canal split) points. Note that "measurement" and "control" are not the same. Both are needed.
- e. Construction of recirculation points or buffer reservoirs in the main canal system.
- f. Improved water level control throughout the project. The flow rate control and measurement (item "d") only pertain to the heads of canals, laterals, and pipelines. Downstream of the heads, it is important to easily maintain fairly constant water levels so that turnout flow rates do not change with time, and so that the canal banks are not damaged. With the proper types of structures, this is easy to do without much human effort.
- g. Re-organization of procedures for ordering and dispersing water. In most modern projects, one group is responsible for operating the main canal; another is responsible for the second level, and so on. The complete procedure for receiving real-time information from the field and responding quickly to requests must typically be revamped for most projects.
- h. Remote monitoring of strategic locations. Such locations are typically buffer reservoirs, drains, and tail ends of canals.
- i. Remote manual control of flow rates at strategic locations. These are the heads of the main canal, and heads of major off takes (turnouts) from the main canal.
- j. Provision for spill, and the recapture of that spill, from the ends of all small canals.

What may seem surprising to some is the complete lack of discussion of canal lining and maintenance equipment. There is no doubt that maintenance equipment must be adequate. Canal lining can reduce maintenance and seepage. But these topics have been discussed for many decades, and the billions of dollars that have been spent on canal lining have generally not brought about modernization. Concrete canal replacement has also been proven not to be a viable solution for most projects. This is because modernization is not just a single action. The items "a-j" above represent a departure from traditional thinking of "concrete civil engineers" and focus on operations.

ITRC also does not employ GIS imaging in its results because GIS maps and charts, although visually appealing, generally reveal only superficial issues. At best, these graphics display where symptoms of problems exist without dealing with their more subtle, underlying causes. Mapping and surface studies alone do not take into account management issues, communications, procedural analysis,

remote control and automation failures, or overall structural or organizational problems. The ITRC approach focuses on the interpretation and evaluation of findings, not the findings themselves.

SUMMARY

The ITRC RAP deals with a broad spectrum of analyses on several different levels. When properly executed by trained evaluators, the RAP approach can quickly provide valuable insight into many aspects of irrigation performance including project design, engineering, operations and management. Furthermore, the organization and content of the RAP provides a systematic project review that enables an evaluator to provide pragmatic recommendations related to hardware and management for the improvement of water delivery service. The ITRC approach has been refined by over two decades of experience and application, and has stood the test of time as a proven, internationally recognized method of irrigation system evaluation.

REFERENCES

Burt, C.M., R.E. Walker, and S.W. Styles (1995). *Irrigation System Evaluation Manual – A Comprehensive, Documented Software Package for Evaluation of Agricultural Irrigation Systems*. ITRC, California Polytechnic State University, San Luis Obispo, CA.

Burt, C.M., K. O'Connor, S.W. Styles, M. Lehmkuhl, C. Tienken and R.E. Walker (1996). *Status and Needs Assessment: Survey of Irrigation Districts*. ITRC California Polytechnic State University, San Luis Obispo, CA.

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Burt, C.M. and S.W. Styles (2000). *Irrigation District Service in the Western United States*. ASCE J. Irrig. and Drain. Engrg. Div., 126(5). 279-282.

Burt, C.M. and S.W. Styles (2003). *Conceptualizing Irrigation Project Modernization Through Benchmarking and the Rapid Appraisal Process*. *Irrigation and Drainage*, 53(2). 145-154

From: "Wenham, Sean" <swenham@fmi.com>
Date: Friday, July 6, 2018 at 2:41:35 PM
To: "Humphrey, Amy - NRCS, Safford, AZ" <Amy.Humphrey@az.usda.gov>
Subject: RE: GVID FMI forms

Afternoon Amy!

Thank you for submitting the proposal for the Gila Valley Irrigation District's *System Optimization Review* project! Our funding committee was enthusiastic about the project and awarded partial funding of \$5,000 to help support the local grant match fundraising effort. I've already submitted the request for payment and will touch base again when the check is available for presentation.

The grant is made possible by Freeport-McMoRan Safford. Please attribute any acknowledgement of our support as such and I've attached a corporate logo for use if needed.

Again, thank you for reaching out with this request and we look forward to the great results that will come from the work and will keep fingers crossed that the Federal grant is approved!

Best regards,
Sean



FREEPORT-McMoRAN



September 4, 2018

Arizona Water Protection Fund
1110 W. Washington, Suite 310
Phoenix, Arizona 85007

To Whom It May Concern:

I am pleased to write this letter of support for the Gila Valley Irrigation District (GVID), which asks for assistance with funding a System Optimization Review. The Town of Thatcher has been a partner with GVID for many years and has built a great relationship, which benefits both parties.

This study will be a much needed first step in modernizing the canal system and implementing steps to save water and deliver it more efficiently and accurately. As a GVID customer and partner, the Town of Thatcher supports GVID's effort and urge those responsible for awarding these grant funds to support GVID and their ongoing commitment to the Gila Valley's water Situation.

A successful modernization update to irrigation infrastructure will benefit the entire community by improving the efficiencies of the irrigation system, including water conservation and storm flow transport, which are critical issues for the Town of Thatcher.

Sincerely,

Heath H. Brown, PE
Town Manager
(928) 428-2290
hbrown@thatcher.az.gov

TOWN OF THATCHER

P.O. BOX 670 • 3700 W. MAIN STREET • THATCHER, AZ 85552 • (928) 428-2290 • FAX (928) 428-7061



**GILA VALLEY NATURAL
RESOURCE CONSERVATION DISTRICT**

267 N. 8th Ave; Suite B- Safford, AZ 85546
Ph: (928) 428-5537 Ext 3593
amy.herbert@az.nacdnet.net

September 3, 2018

Arizona Water Protection Fund Commission
1110 West Washington Street, Suite 310
Phoenix, AZ 85007

To Whom it May Concern:

The Gila Valley Natural Resource Conservation District's (NRCD) mission is to provide local leadership and education to ensure the wise use of all natural resources within the district. We are entrusted to develop comprehensive programs and plans that conserve, and improve the quality of natural resources.

The Gila Valley NRCD fully supports the Gila Valley Irrigation District's grant application for a Rapid Assessment. Agriculture is a major contributor to the area's economy. This project is a vital first step in improving efficiencies in the canal system, which is beneficial to the entire community.

We ask for you to consider funding this application.

Sincerely,

Chairman
Gila Valley NRCD

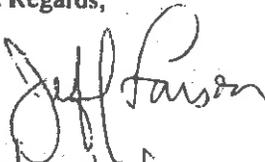
To Whom it May Concern:

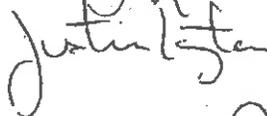
We wish to express our support for the completion of a System Optimization Review (SOR) on all canals which compose the Gila Valley Irrigation District. We strive to manage all our canals as efficiently as possible in their current state, however, we know there is much room for improvement. An outside look at our systems and a plan to prioritize improvements which will increase efficiency is greatly needed. Improving the efficiency of our canals is extremely important to the long term viability of agriculture in our Valley and future generations.

As we plan for an uncertain future, with the challenges of drought, population growth and threats from litigation, it is important that we work together on common goals. A System Optimization Review will give us a starting place to reach the goal of ensuring we are sustainable in a changing world. The SOR will help Gila Valley Irrigation District and their partners work towards preserving the economic viability of farming, while maintaining a high quality environment for people in the community and downstream water users.

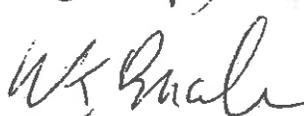
We hope that the Gila Valley Irrigation District receives full funding for their proposal and each of us look forward to working with them in this future endeavor.

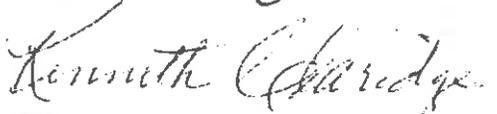
Best Regards,

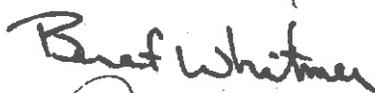
 - Curtis Canal

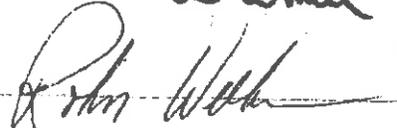
 - Dodge/Smithville Canals / Ft Thomas

 - Union Canal

 - Brown Canal

 - San Jose Canal

 - Highline and Montezuma Canal

 - GRAYSON CANAL

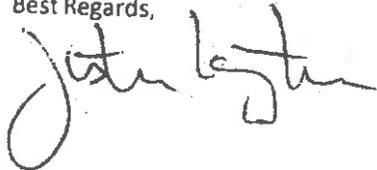
To Whom it May Concern:

It is my pleasure to write on behalf of Graham County Farm Bureau. We fully support Gila Valley Irrigation District's proposal for a System Optimization Review and modernization improvements on the Union and Smithville Canals. GVID has managed a deteriorating canal system as best they could, but now recognize the need for a total system review in order to become more efficient and effective in distributing water to our county farmers and other water users. On their individual farms, these growers have utilized some of the most advanced technologies and practices available to them, it is their desire to carry that same drive for staying modern to the canal systems.

Looking ahead, agriculture, and more specifically the delivery of water, has to prepare for such things as an ongoing drought and a limited supply of ground water. Improving the irrigation district in physical structure and implementing methods for more accurate record keeping are vital to the success of rural life in Graham County.

Again, I give my full support to Gila Valley Irrigation District in pursuing a System Optimization Review as they begin the process to make much needed improvements to remain a successful and vital role here in our county.

Best Regards,

A handwritten signature in black ink, appearing to read "Justin Layton". The signature is written in a cursive, flowing style.

Justin Layton

Secretary, Graham County Farm Bureau