

US EPA ARCHIVE DOCUMENT

Drinking Water Sources near Section 8, Church Rock, NM

NNEPA PWSSP

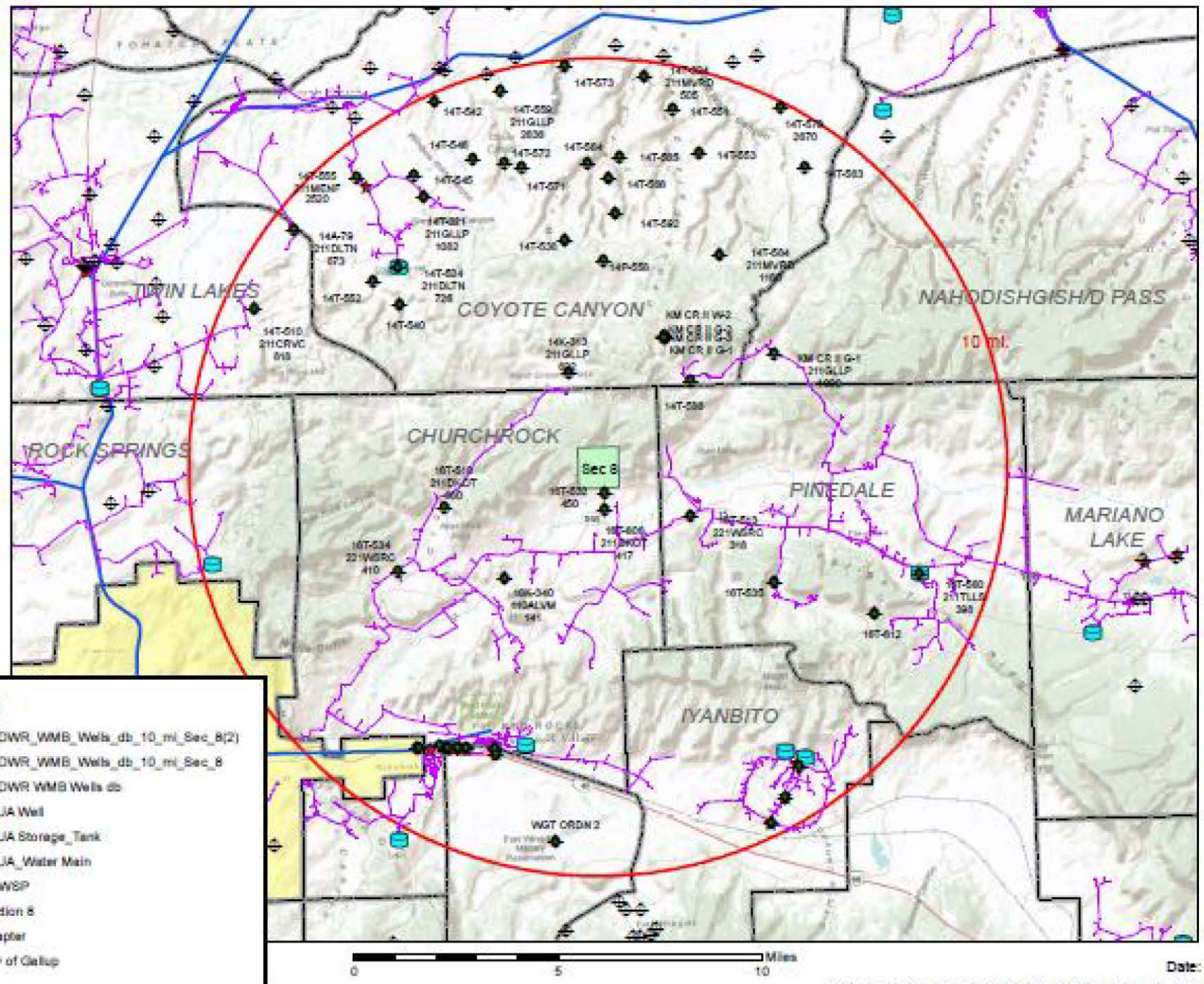
Declarations Made on behalf of Drinking Water

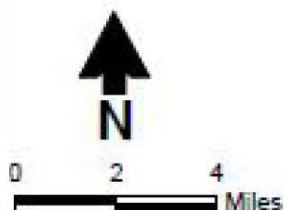
- Declaration of Dr. John W. Leeper: Morrison and Cow Springs Formations are important and current futures sources of municipal water for the Navajo Nation and use of Groundwater will increase. (Docket No. 40-8968-ML, US NRC Board Panel, March 1, 2005)
- Declaration of Dr. Spencer G. Lucas: West Water Canyon Aquifer at Section 8 may be unconfined (FEIS Statement, HRI, Docket No 40-8968) also Dakota is an important source of drinking water (at 3-35)
- More information can be found in the Conjunctive Groundwater Development Plan, part of the NGWSP, 2010

Section 8 Navajo Gallup Groundwater Report & Conjunctive Use Evaluation (the Report)

- URI recently contracted with Daniel B Stephens & Associates, Inc to “present the hydrogeologic conditions in the vicinity of URI’s proposed Section 8 for uranium in situ recovery (ISR) activities of groundwater supply to be developed and conjunctively used as part of the ... Navajo Gallup Water Supply Project.
- The Report makes it clear that groundwater in the area (within 10 miles of the center of Section 8), including the City of Gallup wells outside that area, are important to supplement surface water diversions for the communities at issue.
- The Report also concludes that there will be no adverse impact on area drinking water sources from URI’s ISR project on Section 8, the Navajo Nation strongly disagrees.

URI Section 8 / NGWSP Vicinity Well Locations





**Explanation
(owner and aquifer of completion)**

Navajo Nation well

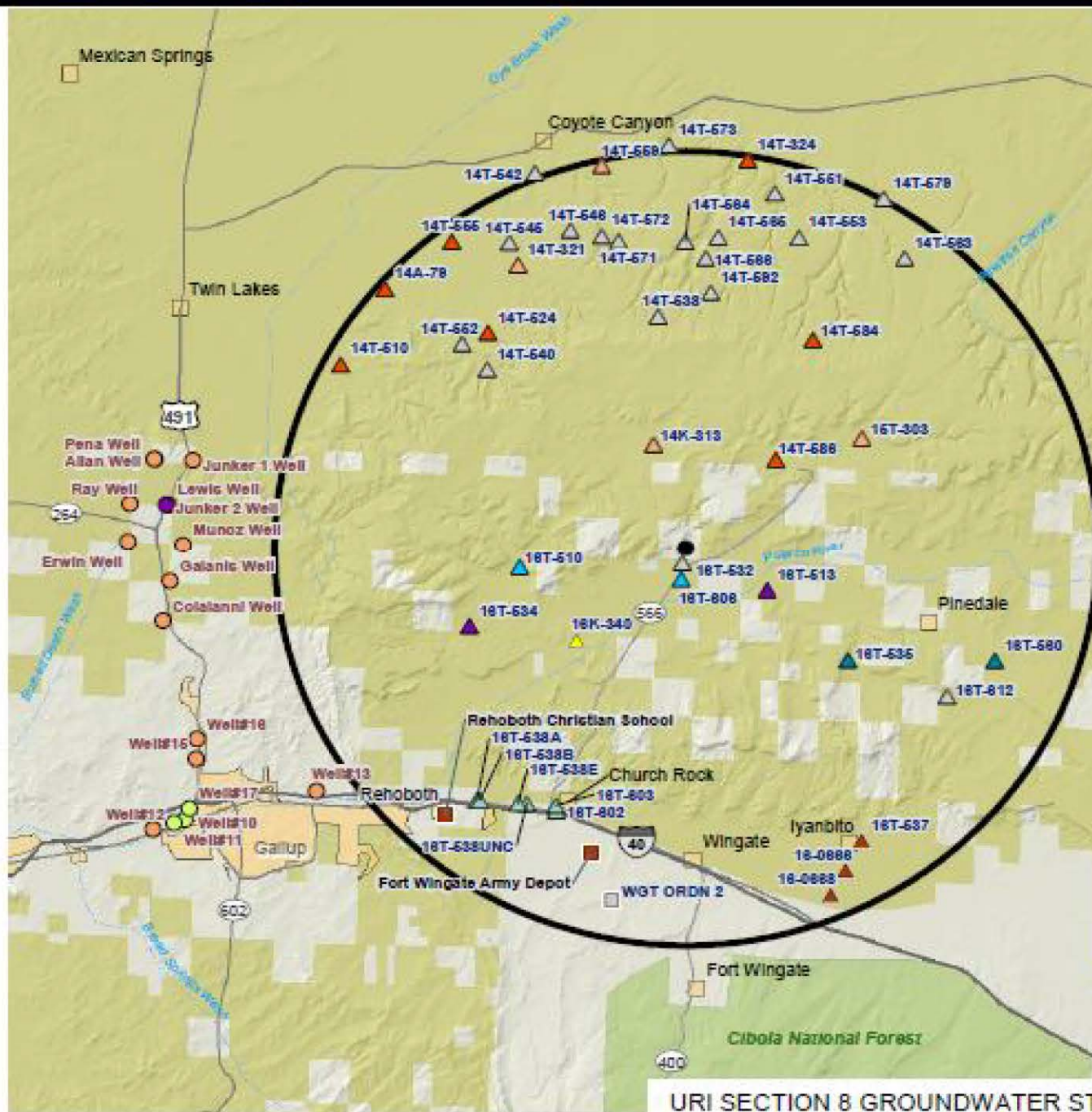
- ▲ Aquifer unknown
- ▲ San Andres Limestone/Glorieta Sandstone
- ▲ Chinle Group
- ▲ San Rafael Group
- ▲ Westwater Canyon Member of Morrison Fm.
- ▲ Gallup Sandstone
- ▲ Dakota Sandstone
- ▲ Mesa Verde Group
- ▲ Quaternary alluvium

City of Gallup well

- Westwater Canyon Member of Morrison Fm.
- Dakota Westwater
- Dakota/Westwater/Gallup Sandstone
- Gallup Sandstone

Other well

- Aquifer unknown
- San Andres Limestone/Glorieta Sandstone
- 10-mile radius
- Navajo reservation and trust lands
- City/community



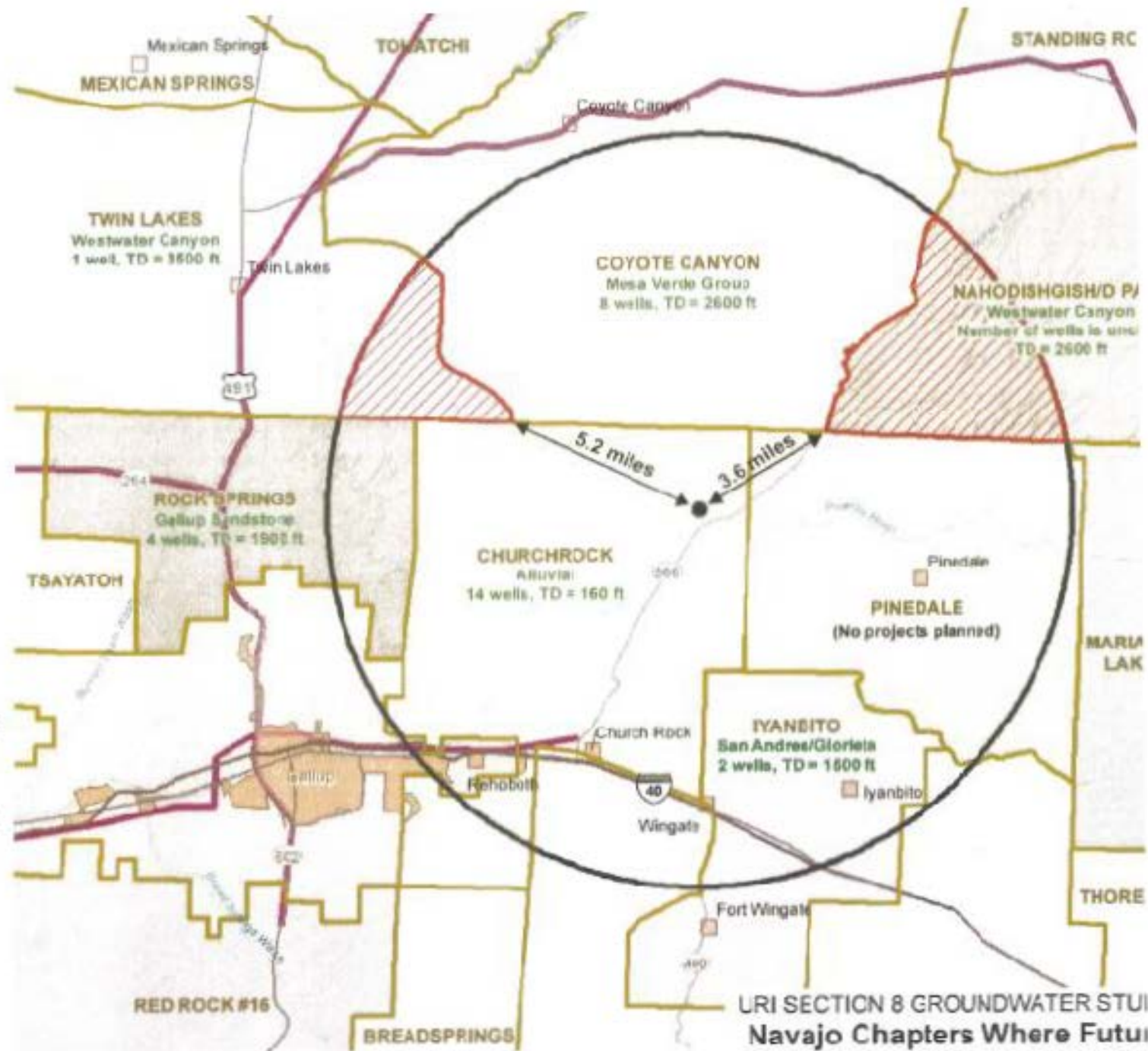
URI SECTION 8 GROUNDWATER ST
Existing Well Locatio

PWSID# 3500211 Mariano Lake/Pinedale/Church Rock -NTU

Results for: Class Code 4000 **Adjusted Alpha (Excl. Radon & U)** **MCL Value: 15** **pCi/L**

Sample Date	Sample Location	Sample ID	Detect Flag	Analyte Result	<small>pCi/L</small>	Comment	Detection Limit	Method ID#
Compliance Point ID:		Compliance Point Name:						
05/09/2006	06B140 Church Rock (no well ID)	06B140	<	1	=	No compliance point assigned. NTUA 06B	1	Calculated
05/09/2006	06B135 Mariano Lake (no well ID)	06B135	<	1	=	No compliance point assigned. NTUA 06B	1	Calculated
05/09/2006	06B138 Church Rock (no well ID)	06B138	<	1	=	No compliance point assigned. NTUA 06B	1	Calculated
05/09/2006	06B136 Smith Lake (no well ID)	06B136	H	1.6	= 0.6	No compliance point assigned. NTUA 06B		Calculated
05/09/2006	06B139 Church Rock (no well ID)	06B139	H	4.1	= 2.4	No compliance point assigned. NTUA 06B		Calculated
05/09/2006	06B137 Smith Lake (no well ID)	06B137	H	4.3	= 1.4	No compliance point assigned. NTUA 06B		Calculated
Compliance Point ID: EP003		Compliance Point Name: 16T-595 Entry Point (Mariano Lake #1)						
03/17/2009	EP003	NN3500211 Mariano Lake 16T-595	RSE35903	H	1	=	09B104	Calculated
11/07/2006	EP003	Mariano Lake 16T-595, 06B371	RSE29077	H	2.3	= 2	NTUA 06B371.	Calculated
08/17/2006	EP003	Mariano Lake NN0211, 16T-595, 06B281	28357	H	2.6	= 2	NTUA 06B281.	Calculated
02/13/2006	EP003	Mariano Lake #1 16T-595 06B27	26755	H	4.8	= 1.9	06B27.	Calculated
11/18/2002	EP003	Mariano Lake #1 16T-595 02B209	16945	H	2.1	= 1.8	NTUA 02B209.	Calculated
Compliance Point ID: EP004		Compliance Point Name: 16T-596 Entry Point (Mariano Lake #2)						
11/18/2008	EP004	NN0211/Mariano Lake 16T-596	08110467	H	0.381	=	Proxy. 4002 - [16.219 pCi/L uranium activit	Calculated
09/10/2008	EP004	NN0211 / Mariano Lake 16T-596 / 06B236	08090492	H	0.835	=	06B236.	3.27 300.0 Modified
06/05/2008	EP004	Mariano Lake 16T-596 West Well #2	08060230	<	4.3	=	Proxy. 4002 - [17.998 pCi/L uranium activit	4.3 Calculated
02/27/2008	EP004	NN0211 16T-596 Mariano Lake	08030081-001A	<	2.28	=	Proxy. 4002 - [15.445 pCi/L uranium activit	2.28 Calculated
08/09/2004	EP004	Smith Lake NM0211 16T-596 04B323	23416	H	2.7	= 0.8	NTUA 04B323.	Calculated
05/13/2004	EP004	Smith Lake 16T596 NM0211 04B176	22863	<	1	=	NTUA 04B176.	1 Calculated
02/19/2004	EP004	Mariano Lake West Well #2 (16T-596)	22238	H	4	= 0.9	NTUA 04B48.	Calculated
10/06/2003	EP004	03B247 Mariano Lake Well #2 16T-596 NM0211	20770	H	1.1	= 2.2	NTUA 03B247.	Calculated
06/29/2003	EP004	03B109 16T-596 Mariano Lake #2	19546	H	2.9	= 2.1	NTUA 03B109.	Calculated
11/19/2002	EP004	Mariano Lake #2, 16T-596 02B210	16946	H	0.8	= 2.3	02B210.	Calculated

Compliance Point ID:	Compliance Point Name:								
03/24/2009	EP005	09B89 Churchrock/ 16T-538B	RSE35980	<	1	=	09B89.	1	Calculated
02/13/2006	EP005	Church Rock B 16T-538B 06B30	26762	<	1	=	06B30.	1	Calculated
11/17/2005	EP005	Churchrock NN0211 16T-538B 05B515	26044	H	1.1	= 1.84	05B515.		Calculated
08/11/2005	EP005	ChurchRock B-16T.538 NN3500211 05B314	25331	<	1	=	NTUA 05B314.	1	Calculated
Compliance Point ID:	Compliance Point Name:								
11/13/2012	EP006	16T-538 Church Rock Well E	RSE45308	H	0.4	= 2.3	12B280		Calculated
03/24/2009	EP006	09B92 Churchrock/ 16T-538E	RSE35979	<	1	=	09B92.	1	Calculated
02/13/2006	EP006	Church Rock E 16T-538E 06B31	26763	H	2	= 2.3	06B31.		Calculated
11/17/2005	EP006	Churchrock NN0211 16T-538E 05B516	26043	H	2	= 2.1	05B516.		Calculated
Compliance Point ID:	Compliance Point Name:								
12/04/2012	EP007	16T-538U Church Rock UNC	RSE45433	H	4.3	= 2.6	12B294		Calculated
03/24/2009	EP007	09B96 Churchrock/ 16T-538U	RSE35978	<	1	=	NTUA 09B96.	1	Calculated
02/13/2006	EP007	Church Rock Unc 16T-538U 06B32	26764	<	1	=	06B32.	1	Calculated
11/17/2005	EP007	Churchrock NN0211 16T-538U 05B517	26042	H	1.4	= 2.3	NTUA 05B517.		Calculated
08/09/2005	EP007	ChurchRock U-16T.538 NN3500211 05B316	25330	H	2.1	= 2	NTUA 05B316.		Calculated
Compliance Point ID:	Compliance Point Name:								
11/29/2012	EP008	16-0691 Pinedale	RSE45395	H	3.9	= 4.4	4th Qtr of Increased Monitoring due to U M		Calculated
08/29/2012	EP008	Pinedale 16-0691	RSE44864	<	1	=		1	Calculated
11/10/2009	EP008	Pinedale 16-0691	RSE37686	H	4.3	= 4.4			Calculated
08/26/2009	EP008	09B266 Pinedale (16-0691)	RSE37066	H	4.9	= 4.2	09B266.		Calculated
05/08/2007	EP008	07B90 Pinedale 16-0691	RSE30372	<	1	=	07B90.	1	Calculated
03/26/2007	EP008	NN0211 Pinedale 16-0691 07B51	RSE30030	H	4.2	= 5	NTUA 07B51.		Calculated
02/13/2007	EP008	NN0211 Pinedale 16-0691 07B13	RSE29690	<	1	=	07B13.		Calculated



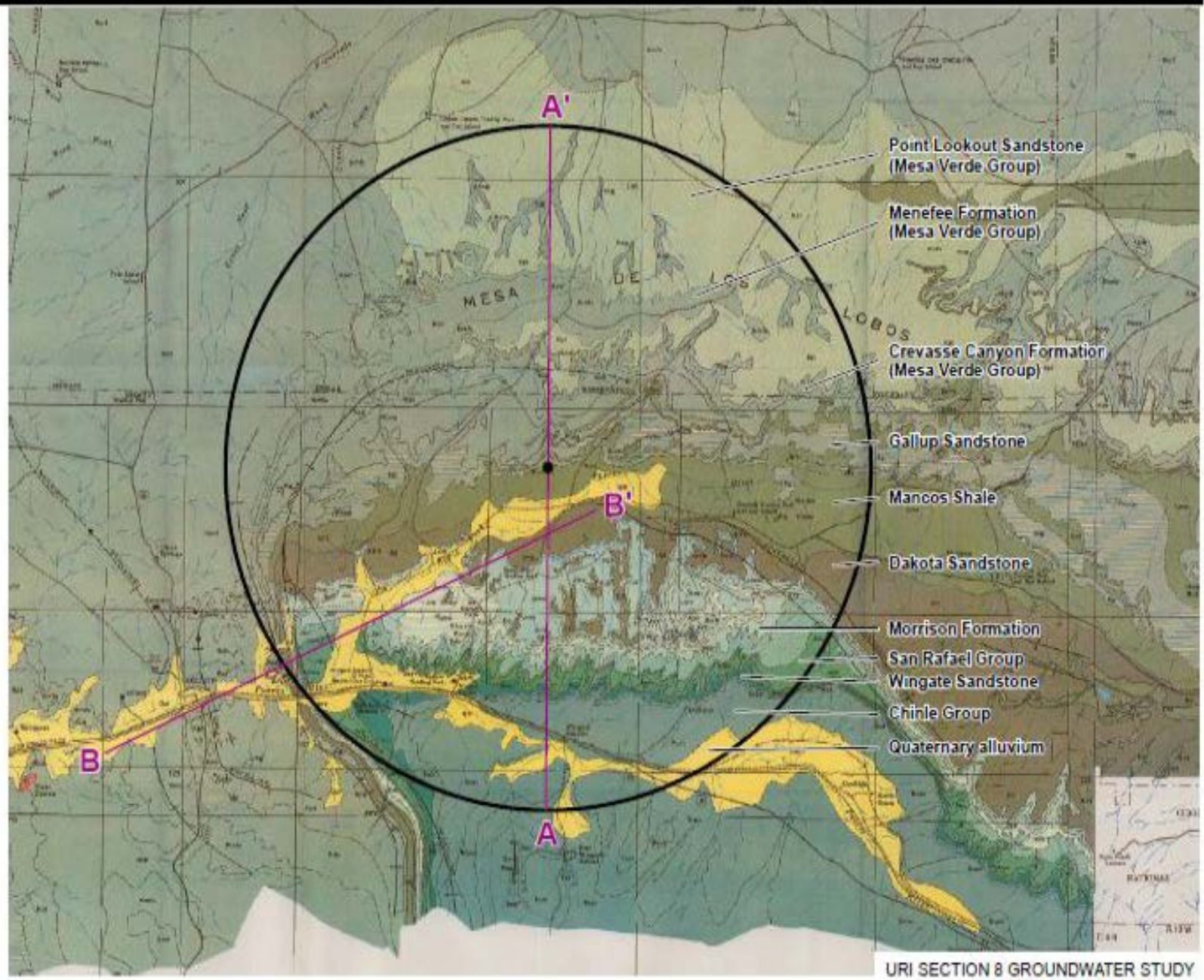
Explanation

- Chapter
- Chapter that has potential Westwater Member wells within 10 miles of Section 8
- 10-mile radius
- City/community
- NGWSP pipeline alignment

Chapter name
Information from NNDWR (2810)

TD = Total estimated depth

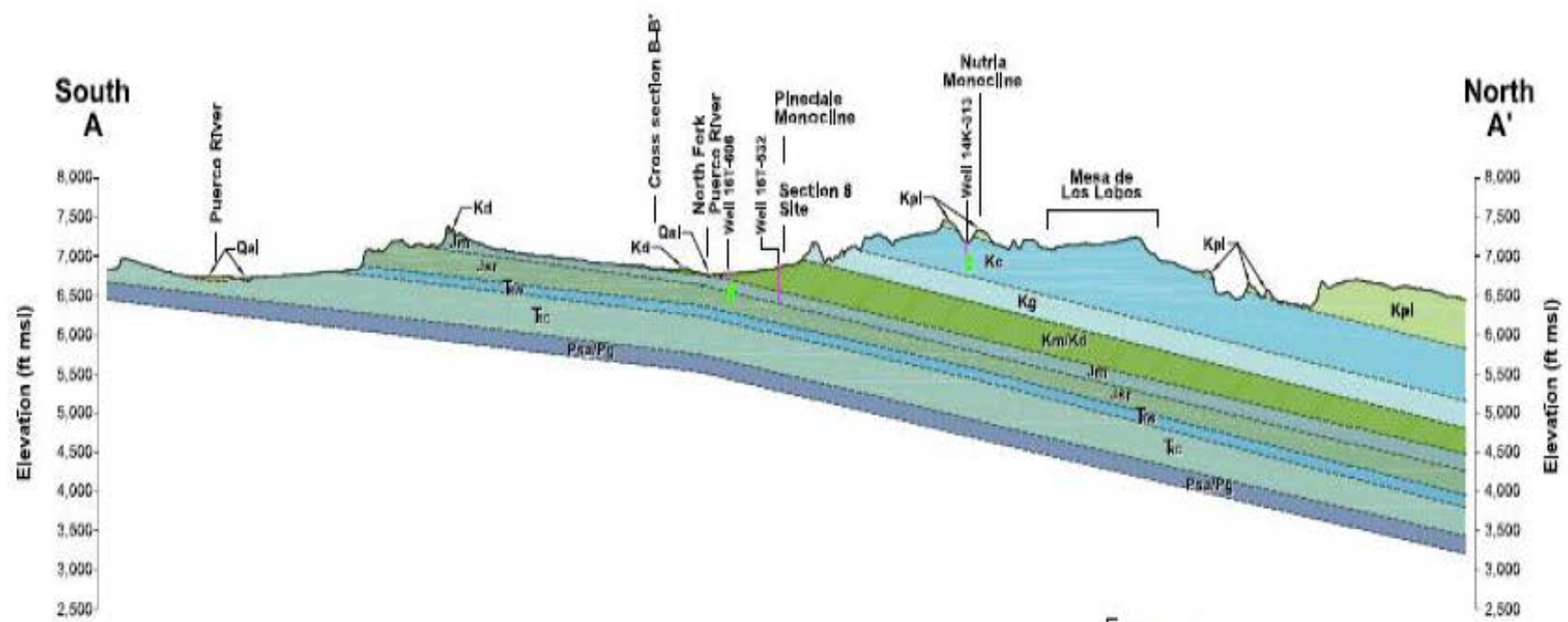




planation
○ 10-mile radius
— Cross section line

Regional hydrogeology of the Navajo and Hopi Reservations, Arizona, New Mexico, and Utah with an on vegetation (Conley, M.E., et al., 1989).

URI SECTION 8 GROUNDWATER STUDY
Surface Geology Map



0 8000 ft
 5X vertical exaggeration

Explanation
 Well
 Well screen

Permian
 Psa San Andres Limestone
 Pg Guletta Sandstone

Triassic
 Tw Wingate Sandstone
 Rc Chinle Group (locally includes Moenkopi Formation)

Jurassic
 Jar San Rafael Group (locally includes Entrada Sandstone, Cow Springs, Shuf Sandstone, Todillo Limestone, and Summerville Formation)
 Jm Menan Formation (locally includes Reapture Member, Brusty Back Member, and Westwater Canyon Member)

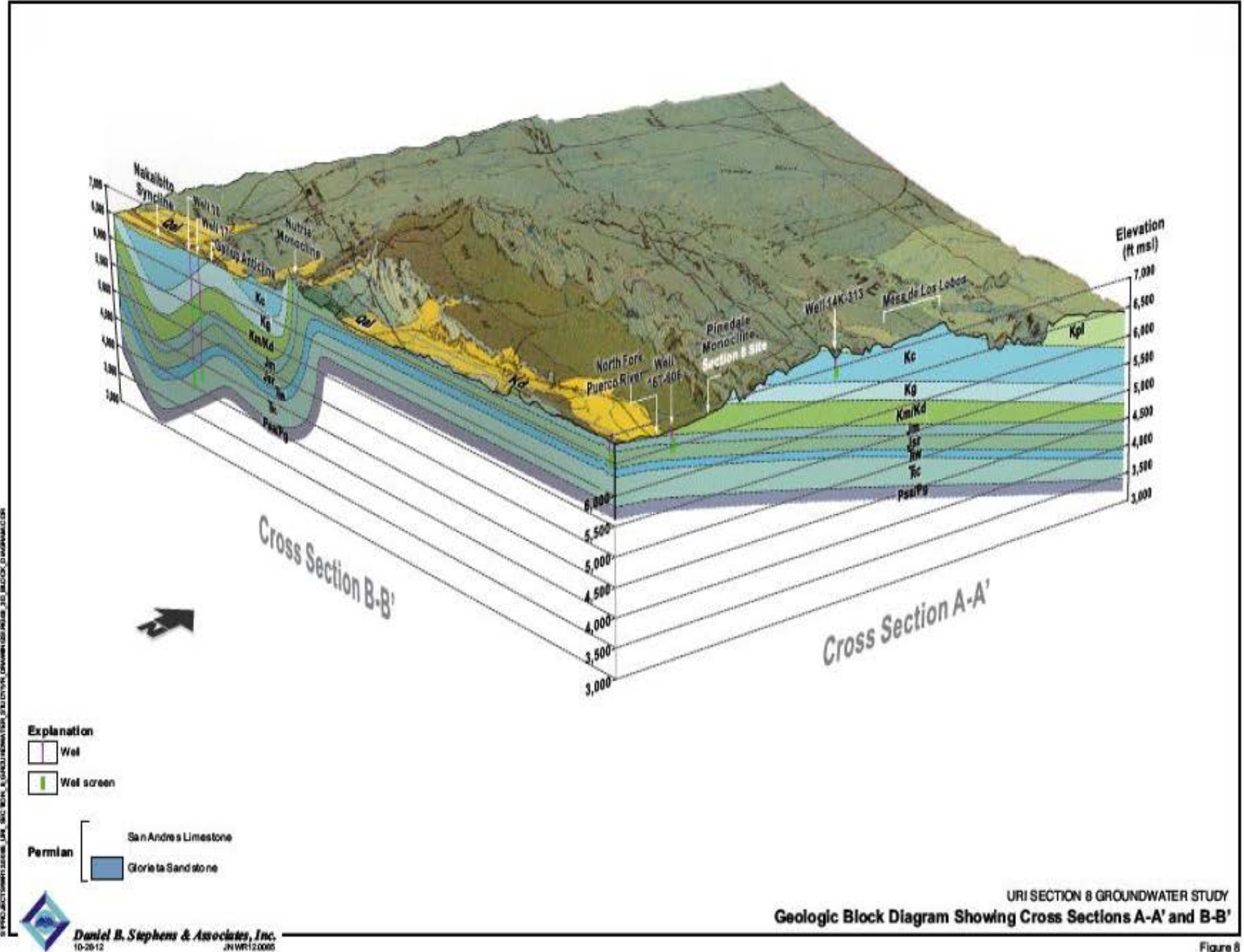
Cretaceous
 Mesa Verde Group
 Kpl Point Lookout Sandstone
 Kc Cheyenne Canyon Formation
 Kg Gallup Sandstone
 Km Mancos Shale
 Kd Dakota Sandstone

Quaternary
 Qal Quaternary alluvium



Daniel B. Stephens & Associates, Inc.
 10-26-12 JN WR12.0085

URI SECTION 8 GROUNDWATER STUDY
 South to North Geologic Cross Section A-A'



A:\PROJ\SECTION8\URIS\URIS_802\DATA\GEOLOGICAL\BLOCKDIAGRAMS\BLOCKDIAGRAMS_3D\BLOCKDIAGRAMS_3D.DWG

Daniel B. Stephens & Associates, Inc.
 10-20-12 JN WF12.0005

URI SECTION 8 GROUNDWATER STUDY
 Geologic Block Diagram Showing Cross Sections A-A' and B-B'

Figure 8

ISL may have adverse impacts on these sources of Drinking Water

- The area around Section 8 is also included as a recharge area for the San Juan Basin for several aquifers that are exposed near and down gradient of this Section.
- NNEPA PWSSP drinking water regulations include provisions for developing and implementing wellhead protection plans, NNPDWR Part XVII – Wellhead Protection Regulations

Conclusion to the DBS report (the Report), not supported by the Navajo Nation as a whole

- It was understood at the outset of this study by the NNEPA that this would provide an inventory of wells and other drinking water sources in the area and provide a compilation of historical data, not to draw any conclusions.
- The Report used old reports, eg, water quality data from the late 1980's before the aquifer was replenished after prior uranium mining.
- NNEPA also questions the value of basing conclusions regarding aquifer quality and connectivity on one-time monitoring and sampling. It is also unclear if the Report took into account the old mine-workings associated with prior uranium mining on Section 17.

9/28/2011

§8

§9

566

§17

§16

Time: 10:00 AM - 10:00 AM

09/28

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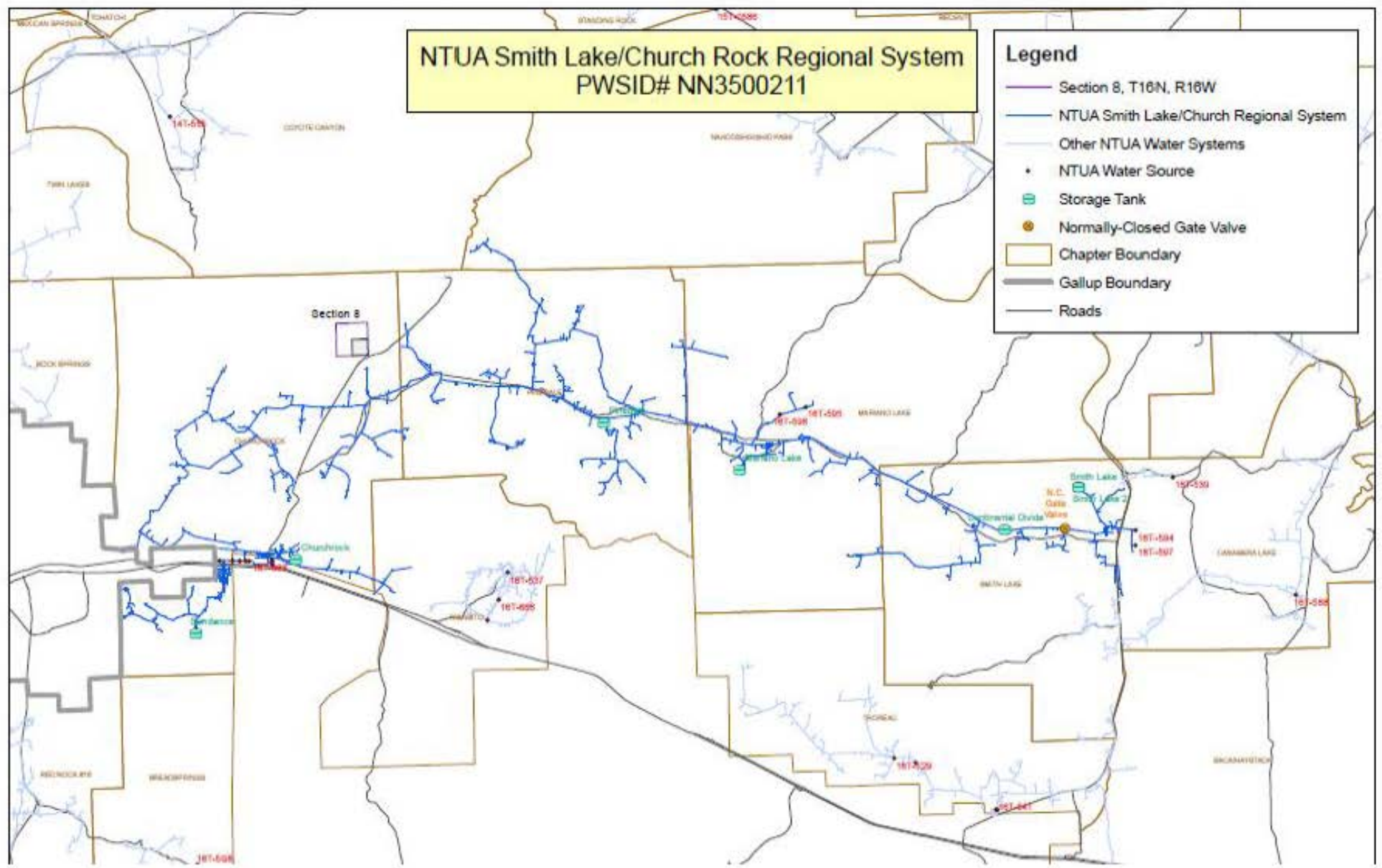
www.fishbase.org

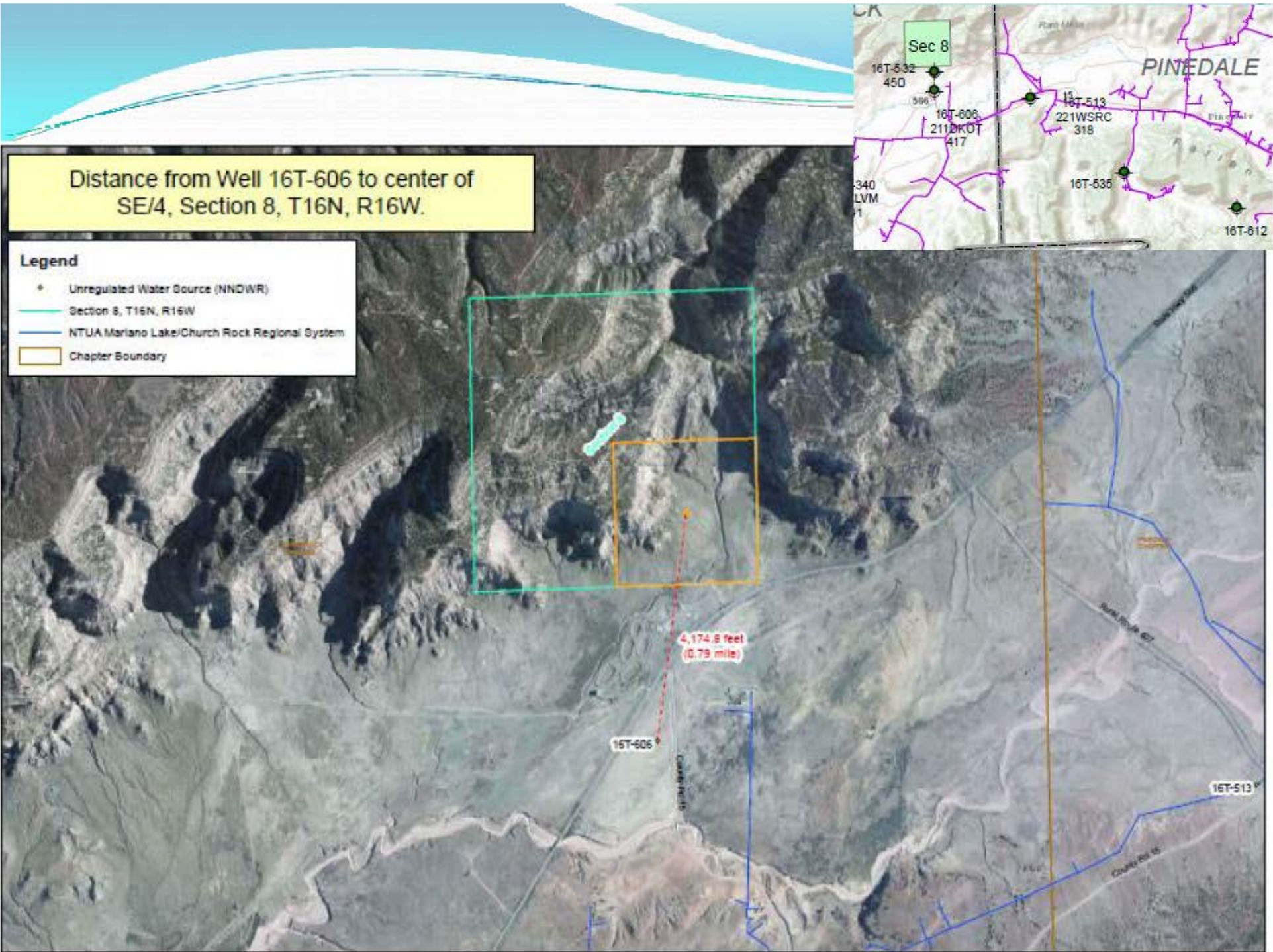
Aquifer Exemption, Provision 40 CFR §146.4 (a)

- Requires a showing that existing wells are not withdrawing water from the exempted portion of the aquifer now or in the future.
- When EPA has exempted a portion of an aquifer under the SDWA, its determination implies that there is **no drinking water** in the exempted portion of the aquifer.
- Pursue the investigation of existing wells for potential domestic water use, or future sources of drinking water
- Identify the portion of the aquifer exempted and locate and legally designate other portion of the aquifer as a “protected aquifer” that will supply the Navajo Nation’s current and future source of drinking water.

Request for Withdrawal of Aquifer Exemption sent to USEPA from the Navajo Nation, January 28, 2013

- URI should be required to perform updated and increased monitoring, sampling, and modeling before taking action on the aquifer exemption.
- Further well sampling is needed in the vicinity of Section 8 because previous sampling was on a one-time sporadic basis.
- Modeling is needed to determine whether there are connections to surface water that people may be consuming and/or connections to other aquifers, including artificial connections.
- An accurate water quality baseline needs to be established for the Westwater Canyon Aquifer.
- URI's max. injection pressure is 117 psi, but the actual max. injection pressure should be determined by a step rate test prior to any injection operations.





16T-606



Constructed in 1980 by UNC/Teton Expl. and transferred to the Navajo Nation.

Total Depth is 417 feet bgs.

Perforated from 277.

Aquifer is the Dakota SS.

Replacement well for 16T-532.



NR-1



KM CR II W-2

- Completed in 10/31/1977
- Total Depth is 2,514 feet bgs
- Aquifer is the Westwater Canyon, Morrison FM.
- Perforated from 2019 feet to total depth

