

Regional Water Supply Planning Update – City of Flagstaff, Navajo Nation & Bureau of Reclamation

Lee Williams and Erin Young, City of Flagstaff
John Leeper PhD, WSP Consultant for Navajo Nation
Valerie Swick, Bureau of Reclamation Phoenix Area Office

Water Resources Research Center Webinar
April 22, 2026



Photo by Brad Hill

TODAY'S SPEAKERS

- Lee Williams, Water Services Director, COF
- Erin Young RG, Water Resources Section Director, COF
- John Leeper PhD, Senior Project Manager, WSP USA Environment and Infrastructure, Inc., for Navajo Nation
- Valerie Swick, Water Resources Planner, Program Development Division Bureau of Reclamation, Phoenix Area Office



CITY OF FLAGSTAFF - LEE WILLIAMS WATER SERVICES DIRECTOR

- Long-term effort to secure reliable water supply
- Regional imbalance of water supply and demand
- Regional drought impacts on existing water resources
- Regional and federal collaboration essential to achieve economies of scale
- Request for Bureau of Reclamation Technical Assistance



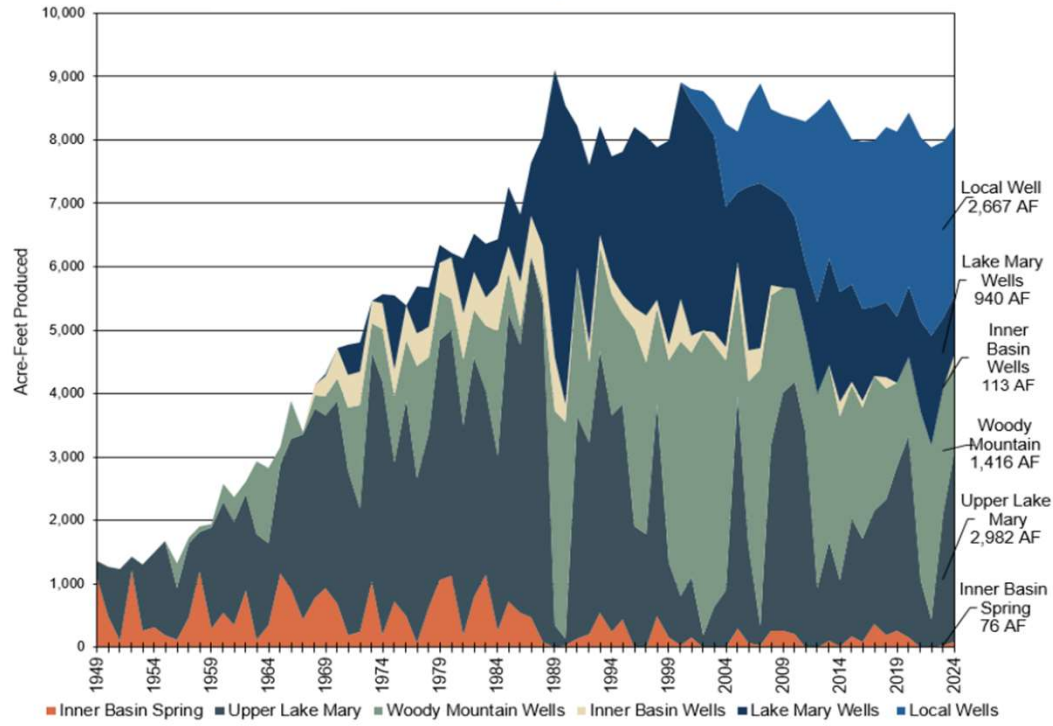
CITY OF FLAGSTAFF – ERIN YOUNG, RG WATER RESOURCES SECTION DIRECTOR

- Flagstaff's Water Supplies
- Water Demand Projections
- Water Resource Options & Challenges

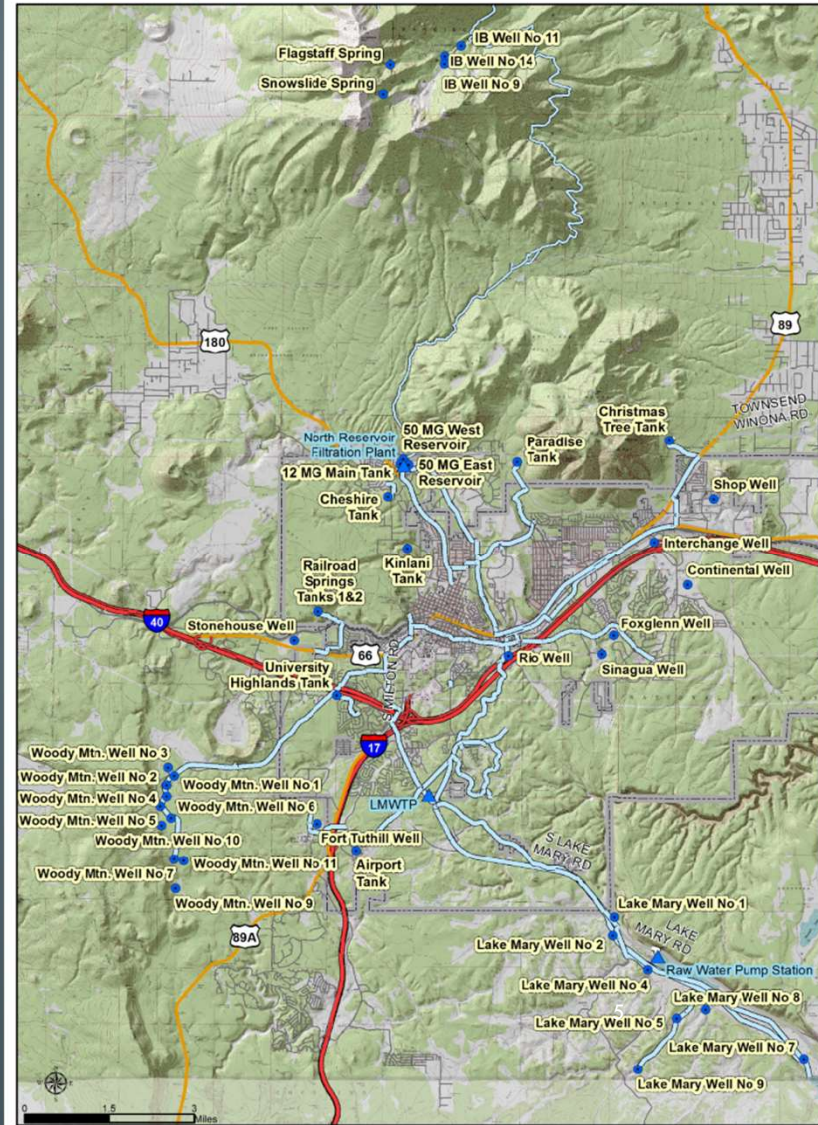


WATER SUPPLY HISTORY

Water Production by Source 1953-Present



WATER INFRASTRUCTURE LOCATIONS



SUPPLY OPTIONS INVESTIGATED

- Decades of investigations and reports
 - Dams in Switzer Canyon & Fort Valley
 - Shallow aquifers in city limits
 - Raising dams on Upper and Lower Lake Mary
 - C-aquifer wells
 - R-aquifer wells
 - Water Conservation
 - Groundwater importation from Leupp, Upper East Clear Creek, Canyon Diablo
 - Colorado River water
- Expansion of Inner Basin system
- Weather modification
- Mogollon Mesa Project – importation from Wilkins Dam
- Participation with Coconino Plateau Watershed Partnership Studies
- Water reuse
- 2004: \$15M voter-approved bond for water resources (71%)
- 2005: Purchased Red Gap Ranch for \$7.9M

FLAGSTAFF WATER DEMAND PROJECTIONS

Projections

- Regional Plan Land Use
- Population
- Resiliency & Redundancy (R&R)

Considerations

- ~50% to build-out
- 5 million tourists/year
- Daily population “doubles”
- Drought
- Wildfire Risk
- Optimizing all water sources

Unmet Demand R&R Projections = 12,100 AFA
Red Gap Ranch Modeled at 16,500 AFA

WATER RESOURCE PLANNING APPROACH & CONSIDERATIONS

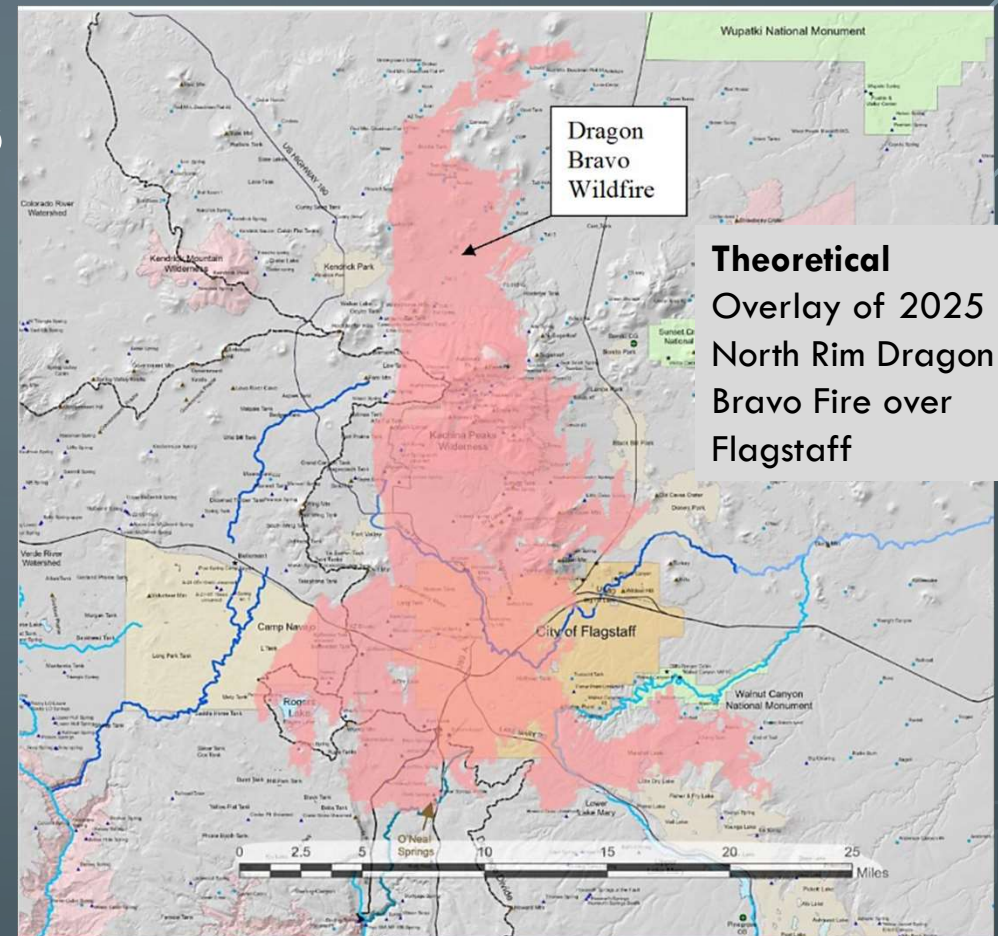
- Planning for Resiliency & Redundancy
- 76% of our water infrastructure is located in forest
- Flagstaff has a greater likelihood of wildfire than 99% of cities nationwide (wildfirerisk.org)
 - "One Fire Away" from a significant regional water crisis
- Public Safety Power Shutoff Events by Arizona Public Service (APS)



Photo: Controlled burn in vicinity of City of Flagstaff well house on USNF lands (Brian Huntzinger, City of Flagstaff Water Services, Water Production Manager)

RECENT (MAJOR) WILDFIRES

- 2010 - Schultz Fire, Inner Basin Waterline
- 2019 - Newman Fire, Upper Lake Mary
- 2019 - Museum Fire, Adjacent to City Limits
- 2022 - Pipeline Fire, Inner Basin Waterline

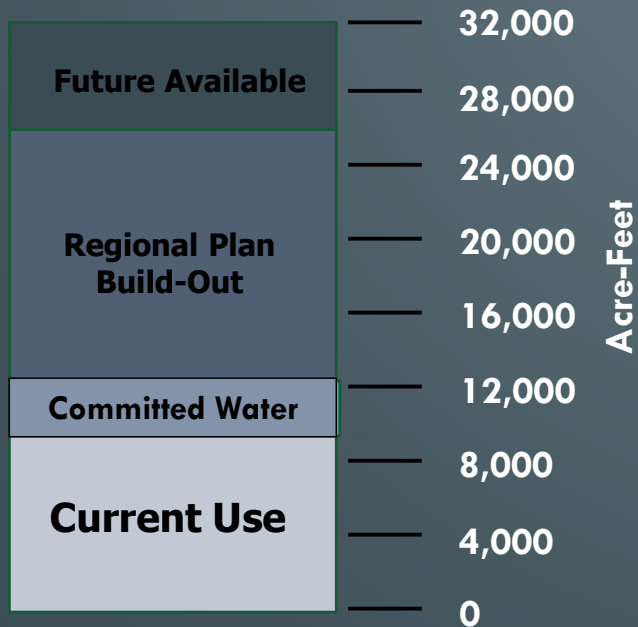


**Theoretical
Overlay of 2025
North Rim Dragon
Bravo Fire over
Flagstaff**

Springer, A., Rickey, R., and J. Noll, The 2025 Dragon Bravo and White Sage Wildfires – Impacts on North Rim Grand Canyon Water Resource: Arizona Hydrological Society Flagstaff Chapter Meeting, November 6, 2025

DESIGNATION OF ADEQUATE WATER SUPPLY

Designation Allocation



Physical Availability Demonstration 32,210 Acre-feet

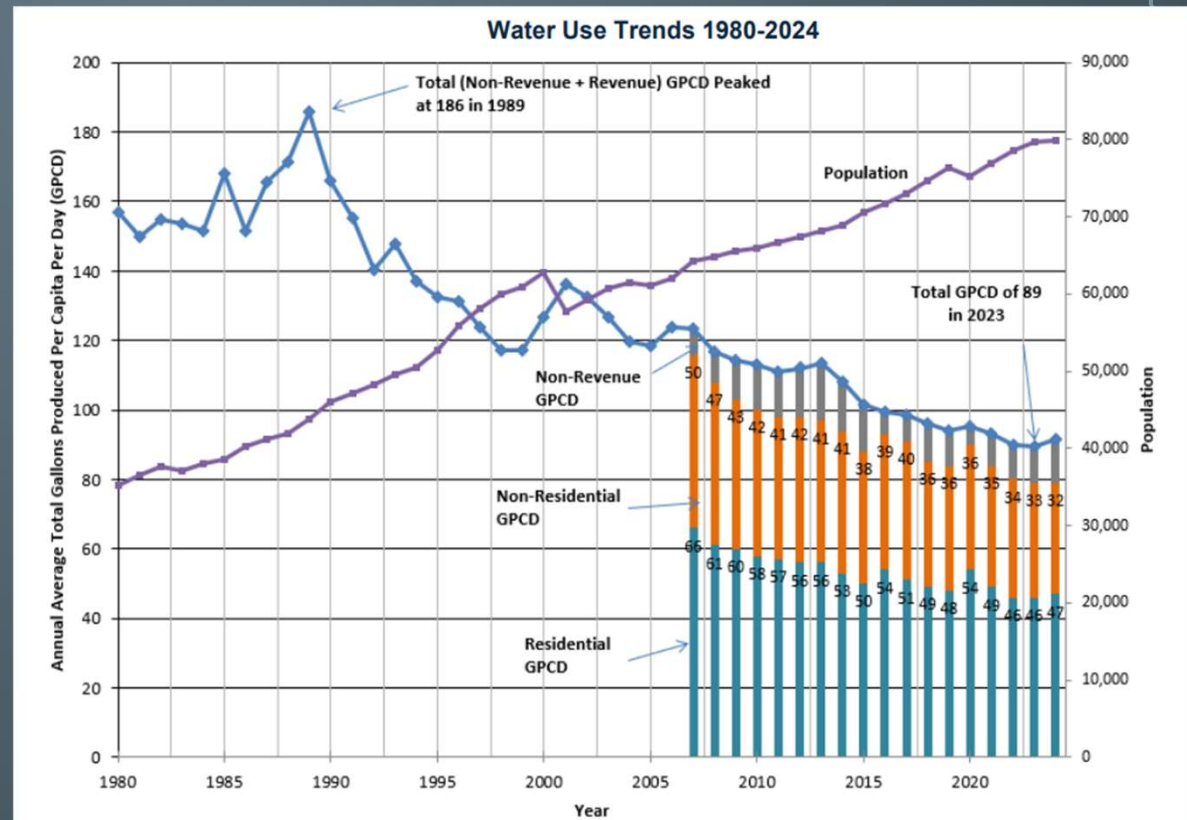
2,212 AF Reclaimed Water
 +
 3,585 AF Upper Lake Mary
 +
 9,913 AF Current Groundwater Sources
 +
 16,500 AF Red Gap Ranch Groundwater



Flagstaff Designation of Adequate Water Supply, 2013

WATER CONSERVATION EFFORTS

- 1988 Water Conservation Ordinance, Tiered Rates, Rebates
- 2004 Water Conservation Program Established
- 2020 Water Conservation Strategic Plan = 80 Total GPCD by 2040
- US EPA WaterSense Awards (2020, 2022, 2023, 2024)
- Alliance for Water Efficiency Gold-Level Utility (2024)



WATER REUSE EFFORTS

- Reuse at Continental Golf Course 1966
- Class A+ = 20% of total water delivered annually since ~1996
- Seasonality = <0.5 mgd in summer to 4-5 mgd in winter
- Not enough water for meaningful DPR
- Complex hydrogeology for IPR permitting
- Not a “new” water supply
- Members of Arizona WaterReuse



Photo: Flagstaff Former Mayor Coral Evans, Pure Water Brew Challenge (2018?)



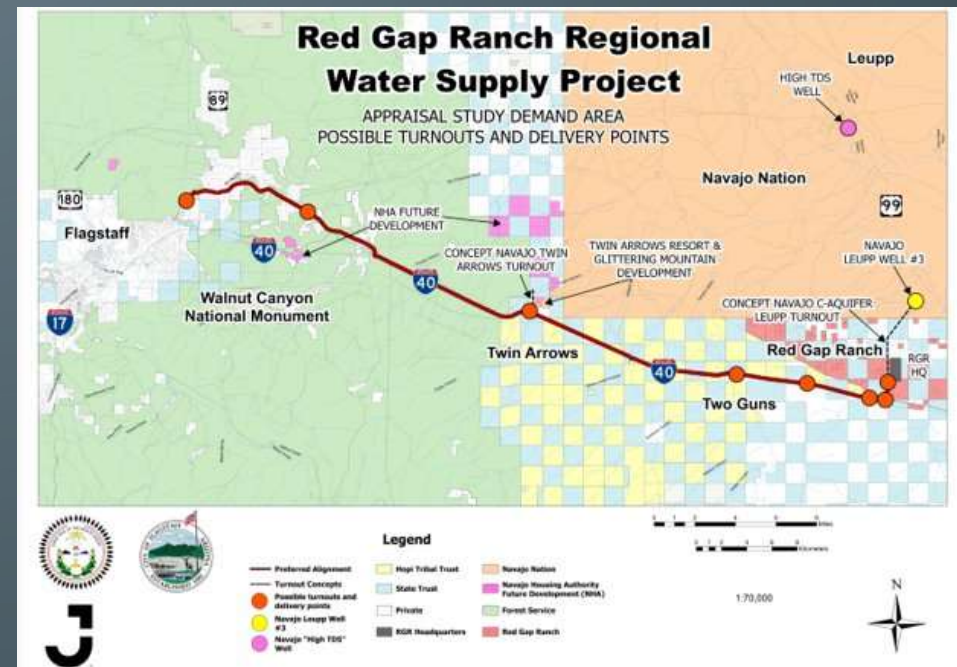
RED GAP RANCH ACQUISITION

- 2005: Purchased for \$7.9M
- 23,500 total acres
- 40 miles east of Flagstaff
- Two municipal wells in C aquifer – extensive studies
- Developing in accordance with Northeastern Arizona Indian Water Rights Settlement Agreement



FLAGSTAFF INVESTMENT & DUE DILIGENCE RED GAP RANCH

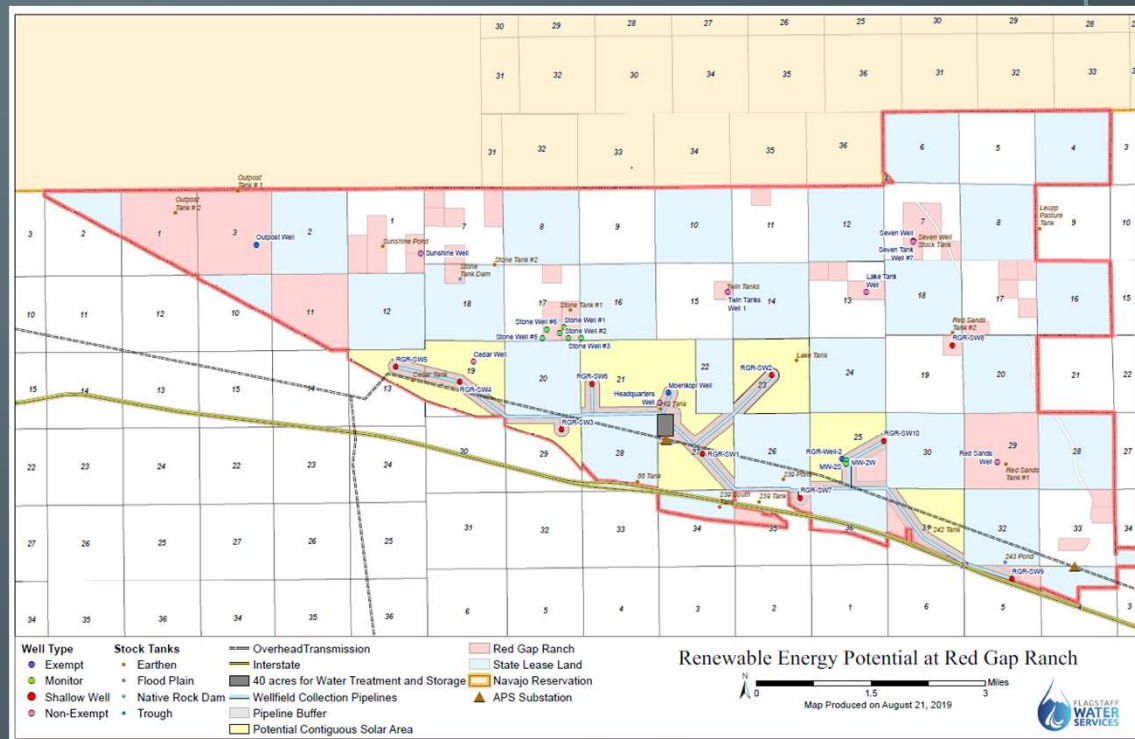
- 2005: Purchased RGR (\$7.9M)
- 2009 & 2025: Completed pipeline alignment studies (Jacobs Engineering)
- 2011: Drilled 10 wells
- 2013: Adequate Water Supply Designation (16,500 AFY)
- 2015: Groundwater Modeling with Navajo Nation and Reclamation
- 2016: COF-ADOT Agreement
- 2025: Value Planning Study with Reclamation and Navajo Nation
- Letters to BOR for assistance



POWER GENERATION POTENTIAL

Red Gap Ranch as a Resource

- City entered agency IGA for virtual renewable power purchases (2025)
- City/APS investigated RGR for solar and wind power potential (2019)
- Possible renewable projects near RGR
 - MOU with Hopi Tribe (2015)
 - Possible Navajo Nation
 - Possible ASLD lands
 - Other developers in the region
- Possible pump-storage power generation
- Appraisal Study will investigate all power options



NAVAJO NATION PERSPECTIVES – JOHN LEEPER, PHD SENIOR PROJECT MANAGER, WSP

- Navajo Nation Southwest Region water needs
- Interest in collaboration and economy of scale
- Economic development opportunity in the Twin Arrows and Leupp/Dilcon Areas
- Protect and manage the resource



NAVAJO NATION AREA ECONOMIC DEVELOPMENT NEEDS AND OPPORTUNITIES



- Navajo Nation anticipates significant economic development along I-40 corridor.

Master Plan key Components

Key Developments Phase 1

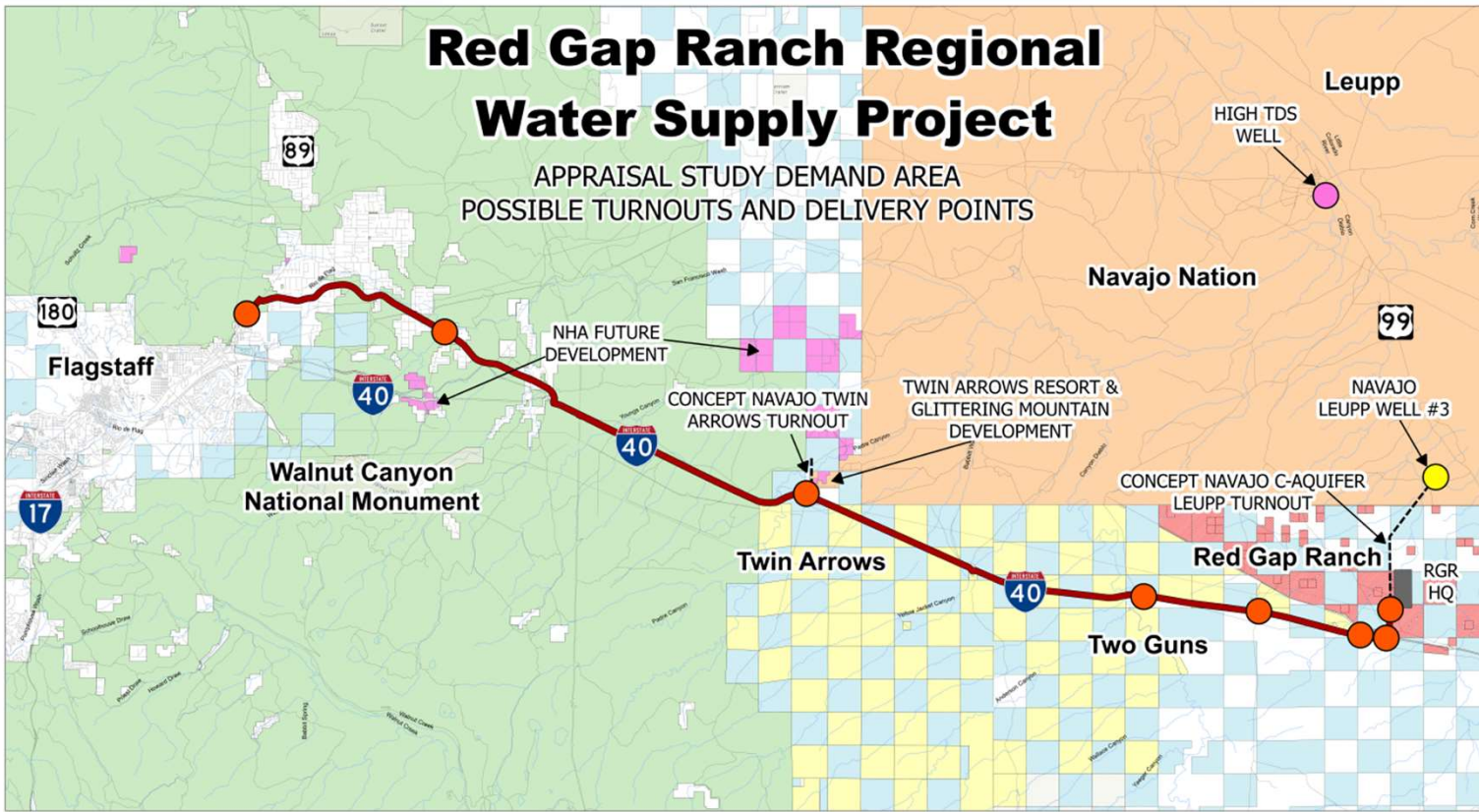
1. Entertainment complex (50,000 sq feet with ability to expand)
4. Mixed Use Specialty Retail (20,000 sq feet. 2 Stories. Has residential worked in)
6. Upscale Hotel (75 to 100 rooms)
7. Service Oriented Retail (40,000 sq feet. Includes auto service)
8. Big Box Retail (80,000 sq feet. Grocer, multi tenant, food service)
9. Neighborhood Retail (20,000 sq feet. Restaurants, Services)
10. Residential Town Homes/Condos (128 units)
11. Residential Units (SF detached. 32 lots)
12. Mixed Use

Other Key Identifiers
J. Mountain Plaza
L. Amphitheatre Plaza
N. Market Square



Red Gap Ranch Regional Water Supply Project

APPRAISAL STUDY DEMAND AREA
POSSIBLE TURNOUTS AND DELIVERY POINTS



Legend

- | | | |
|---------------------------------------|-------------------|---|
| Preferred Alignment | Hopi Tribal Trust | Navajo Nation |
| Turnout Concepts | State Trust | Navajo Housing Authority Future Development (NHA) |
| Possible turnouts and delivery points | Private | Forest Service |
| Navajo Leupp Well #3 | RGR Headquarters | Red Gap Ranch |
| Navajo "High TDS" Well | | |

0 1 2 4 6 8 Miles

0 1 2 4 6 8 Kilometers

1:70,000

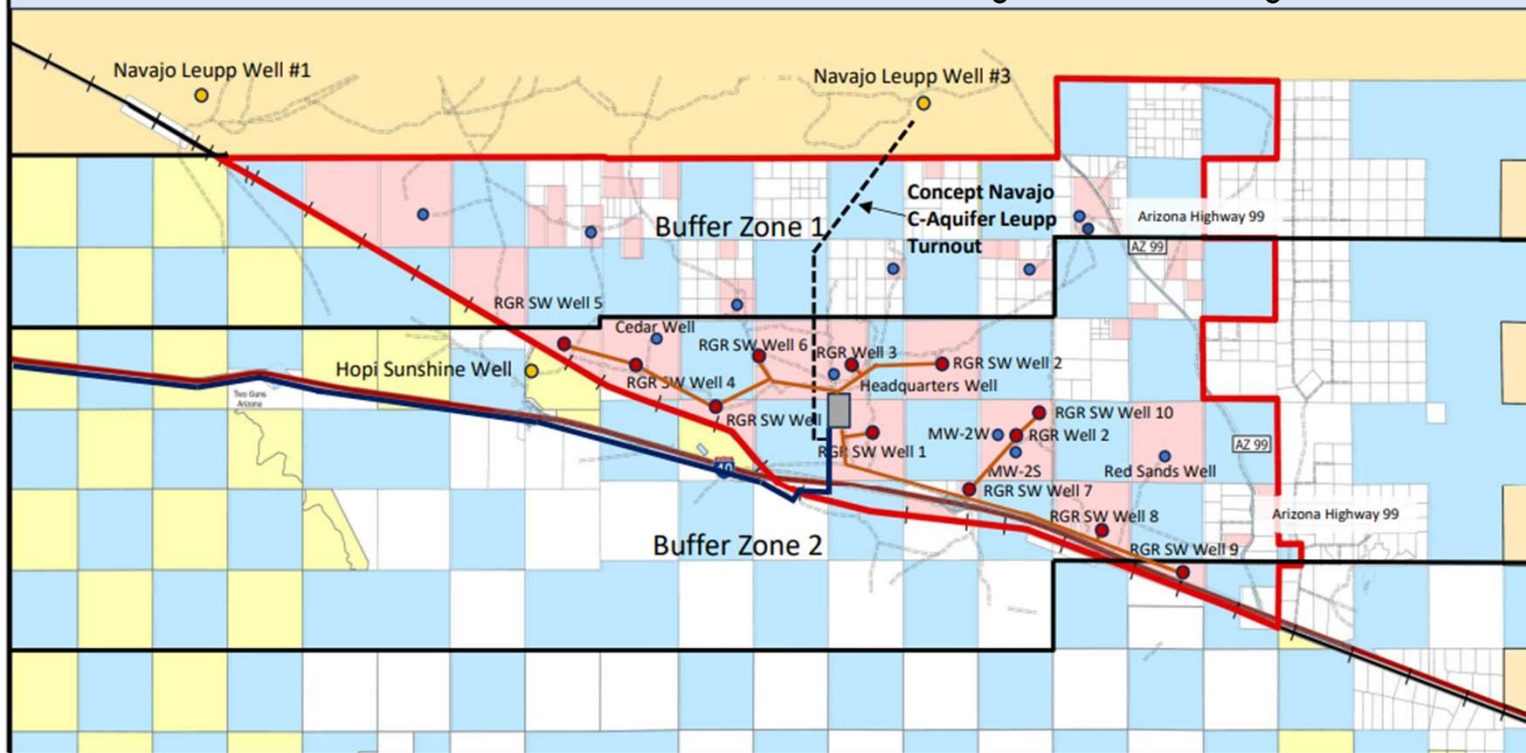




Municipal Well Locations and Proposed On-Site Infrastructure

Red Gap Ranch

Consistent with the Northeastern Arizona Indian Water Rights Settlement Agreement

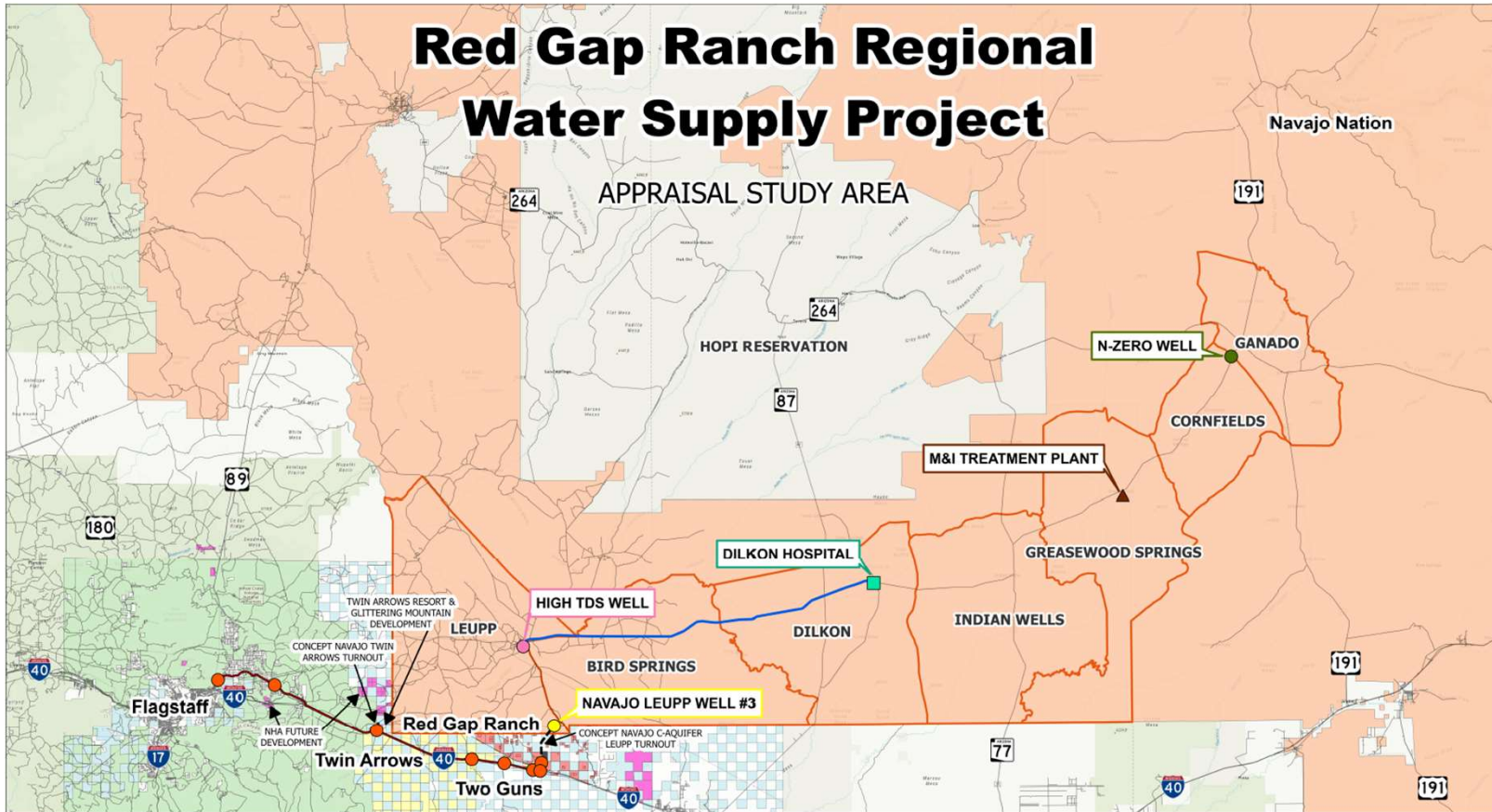


- Red Gap Ranch Boundary
- Navajo Lands
- Private Property
- Municipal Wells
- Stock or Exempt Wells
- Hopi Lands
- Red Gap Ranch Property
- ASLD Lands as of the Effective Date
- Preliminary Well Pipelines
- Proposed Red Gap Transmission Pipeline
- Ranch Headquarters - Proposed Water Treatment Location

0 0.5 1 2 3 Miles



Red Gap Ranch Regional Water Supply Project



Legend

- Preferred Alignment
- Turnout Concepts
- Possible turnouts and delivery points
- Navajo Leupp Well #3
- Navajo "High TDS" Well
- Navajo N-Zero Well
- Dilkon Hospital
- ▲ M&I Treatment Plant
- Hopi Tribal Trust
- State Trust
- Private
- RGR Headquarters
- Navajo Nation
- Navajo Housing Authority Future Development (NHA)
- Forest Service
- Red Gap Ranch



1:250,000



BUREAU OF RECLAMATION – VALERIE SWICK WATER RESOURCES PLANNER

- Why and how Bureau of Reclamation is involved
- Support for regional collaboration through Value Planning and Appraisal Study process



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Why is Reclamation Involved?

- Trust responsibility for Native American tribes.
- Involved in many water supply studies in Northern Arizona over the past 25 year, especially involving tribes.
- The studies identify water supply shortfall for Flagstaff, Navajo Nation, among others, across the region.
- Navajo groundwater sources are high in salinity or brackish.
- Flagstaff asked for help.



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How is Reclamation Involved?

- Value Planning Study. ← *Completed*
- Appraisal Study.
- Feasibility Study.
- Design infrastructure.
- Construct infrastructure.



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What's involved in a Value Planning Study?

- Bring together interested partners and multi-disciplinary team.
- Review previous studies.
- Develop evaluation criteria.
- Develop ideas/alternatives.
- Help to develop the appraisal study scope of work.
- Build CONSENSUS.



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What's involved in an Appraisal Study?

- Description of Problems and Needs, Opportunities and Potential Benefits.
- Analyze Alternatives (including future without project)
- Assess Alternative Viability
- Findings and Recommendation
 - Identify and confirm the problem
 - At least one alternative that will solve the problem
 - Determine the federal interest



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What's Next for Regional Investigation?

- Status of work with Navajo Nation & City of Flagstaff
 - Initiated scoping process (Plan of Study).
 - Emphasis on Red Gap Ranch water supply with water conveyance and turnouts to serve City of Flagstaff and Navajo Nation with opportunities for other stakeholders.
 - Developed initial roles and responsibilities.



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What's Next for Reclamation?

- Complete Plan of Study & Project Management Plan (scope, budget & schedule).
- Development of Cost-Share Agreement.
- Formal start of appraisal study and public notification.



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What's after Appraisal Study if agency recommends to proceed to Feasibility?

- Congressional approval for Feasibility Study.
- Conduct Feasibility Study to determine a recommended alternative.
- Department of Interior Secretary will submit recommended alternative to congress for approval.
- Congressional approval for infrastructure design and appropriations for construction.

THANK YOU!

QUESTIONS?



Red Gap Ranch Headquarters, June 2025