

Updating A Wellhead Protection Plan in Response to Oil and Gas Activity: **A Case Study of the Winstar World Casino and Resort**

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Overview

- What is a Wellhead Protection Plan
- Environmental Problem Analysis
 - Creation of Guide
- Case study of the Chickasaw Wellhead Protection Plan
 - Winstar World Casino and Resort

Wellhead Protection Program



Typical wellhead enclosure at the Winstar World Casino and Resort.

- Established by 1986 amendments to Safe Drinking Water Act
- Protect groundwater wells supplying drinking water to public water systems from contamination
- Prevention is most economically efficient means to maintain high quality drinking water

Wellhead Protection Plan

Wellhead Protection Plan (WPP) must cover*:

- Roles and duties of all state and local government entities and public water suppliers
- Delineate Wellhead Protection Areas (WPA) for each wellhead
- Identify known and potential sources of contamination within each WPA
 - Develop mgmt schemes to safeguard wells
- Contingency planning
- Siting of new wells
- Public outreach and education

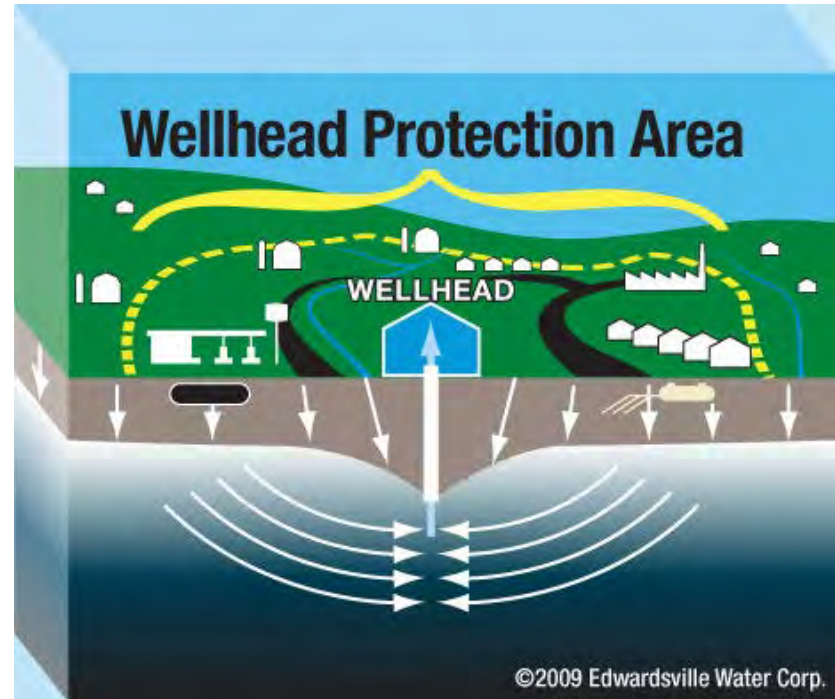


Image: <http://www.edwardsvillewater.com/bm/ewc-member-news/wellhead-protection.shtml>

*(EPA,1989).

Environmental Problem Analysis

- WPP

- 61% (

group

- OK
pro

- Probl
provi
oil or

Identify

- Identify potential threat(s)
- Verify their location

Review

- Review existing documents pertinent to the public water supply, including;
- Wellhead Protection Plan (WPP)
- SWAP Report for each wellhead contributing to the public water supply

Update

- Update your WPP with information relevant to public safety

Water Quality (?)

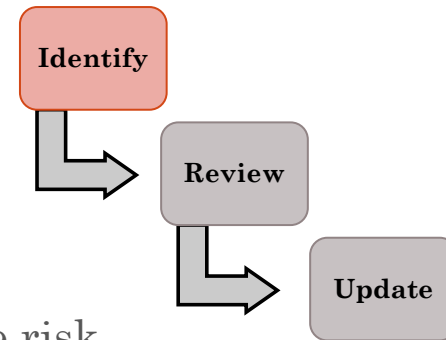
Threat to Groundwater

- Realized or perceived, test
 - Creates baseline and reference
 - Without, contamination may be difficult to prove



Image: <https://www.nal.usda.gov/waic/water-quality>

Identify: Oil & Gas Activity

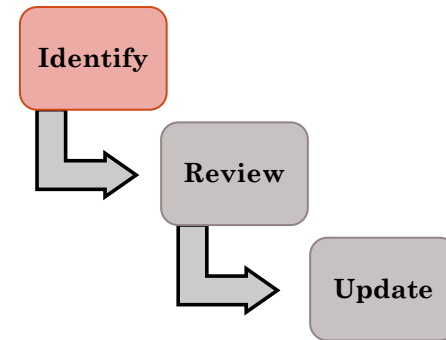


- Established Wellhead Program does not remove risk
- EPA analysis found groundwater contamination occurring at nearly every stage of oil or natural gas production (2016).

Possible Threats from Oil and Gas Activity*:

- Initial drilling and wellhead completion;
- Stimulation, flow back, and production of oil or gas products;
- Underground Injection Control wells;
- Surface and/or subsurface spills from supporting activities and services;
- Nearby abandoned, plugged, or mechanically unstable wells.

Identify Cont.

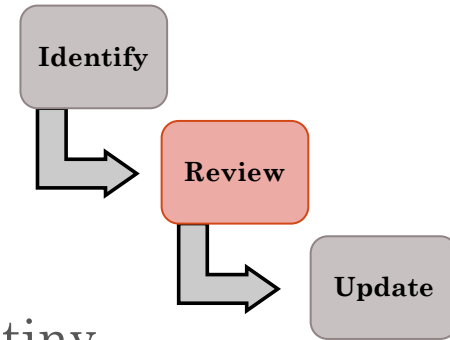


How to Identify:

- Involvement in local community and water planning district;
- Monitor legal notice newspapers;
- Consult with local health, fire/emergency, extension agents;
- Attentive to future projects WPA
- Remain vigilant.



Review

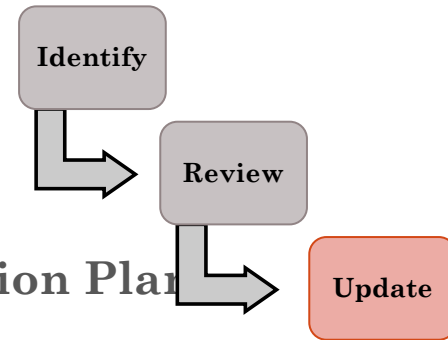


Review all relevant information with scrutiny

Components to Review:

- Existing WPP;
- Delineated WPAs & methodology;
- Source Water Assessment Program (SWAP) reports;
- Existing inventory of possible sources of contamination;
- Inventory of wells and pumping capacity;
- Review existing service area
 - Increase/decrease in customers
 - Future planning

Act



Take action, update the Wellhead Protection Plan

Information to Include:

- Updated land-use changes within WPA;
- Addition or removal of wells;
- Changes in pumping or delivery capacity;
- Installation of adjacent private wells;
- New hydrogeologic discoveries pertaining to the area;
- Addition or removal of possible contaminant sources;
- Changes in emergency planning and response personnel;
- Contingency planning;
- Educational training;
- Future plans pertaining to wellhead protection.
 - Snapshot in time

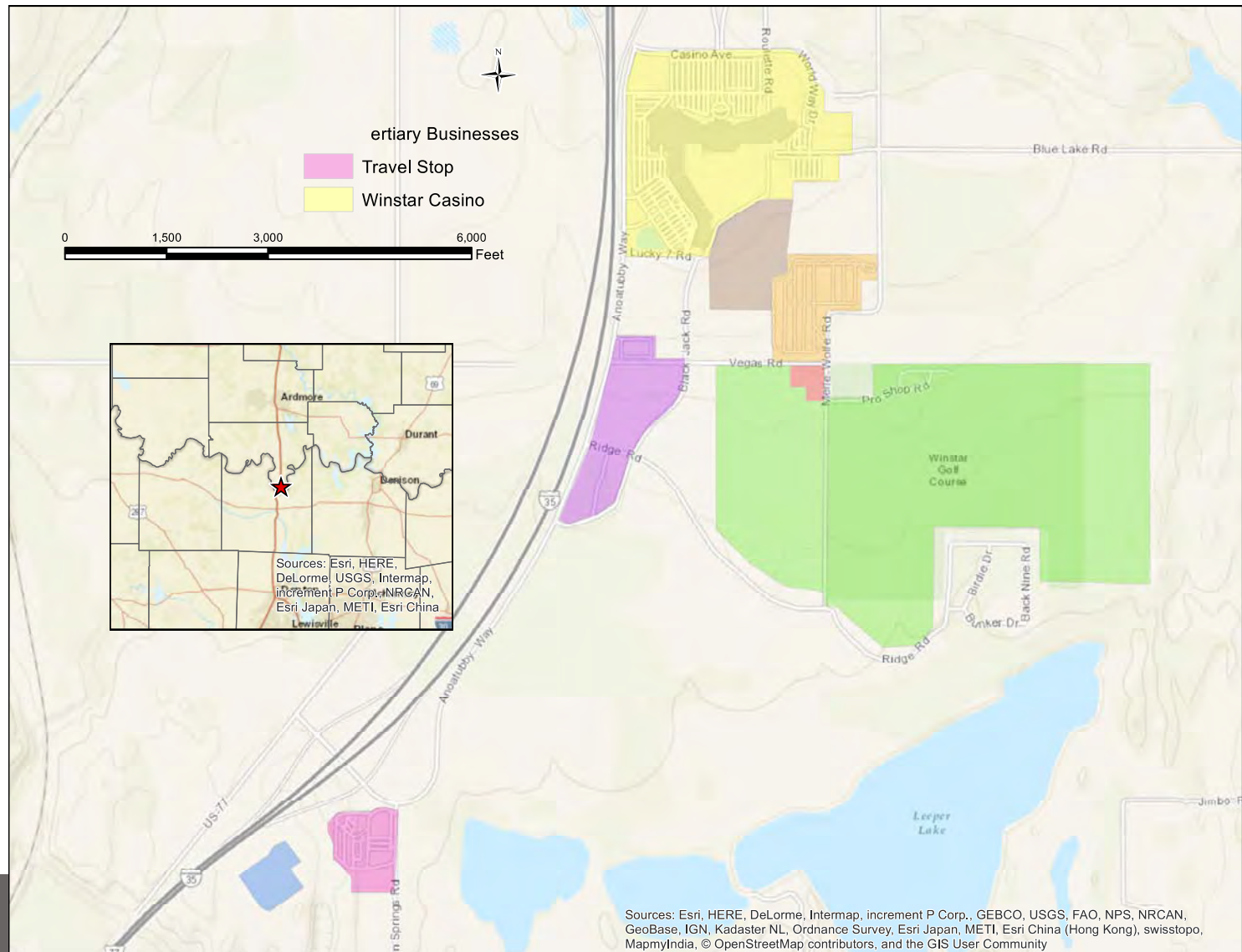
Winstar Case Study

Winstar World Casino and Resort

- Owned/operated by Chickasaw Nation
- Massive complex near OK | TX
 - 660,000+ square feet of gaming and convention space
 - 7,500+ electronic and table games
 - 3,500 seat auditorium
 - Recently expanded 36-hole golf course
- “Largest Casino in the World”



Image: <https://www.winstarworldcasino.com>



Winstar Gaming Complex

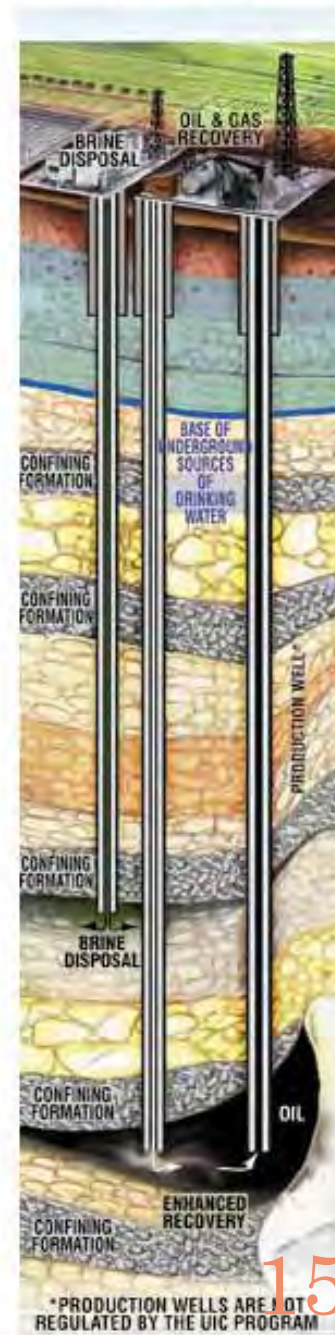
Winstar Gaming Complex (WGC) includes: RV Park, Travel Plaza, Fire Station, WWTP, Maintenance facilities, Hotels

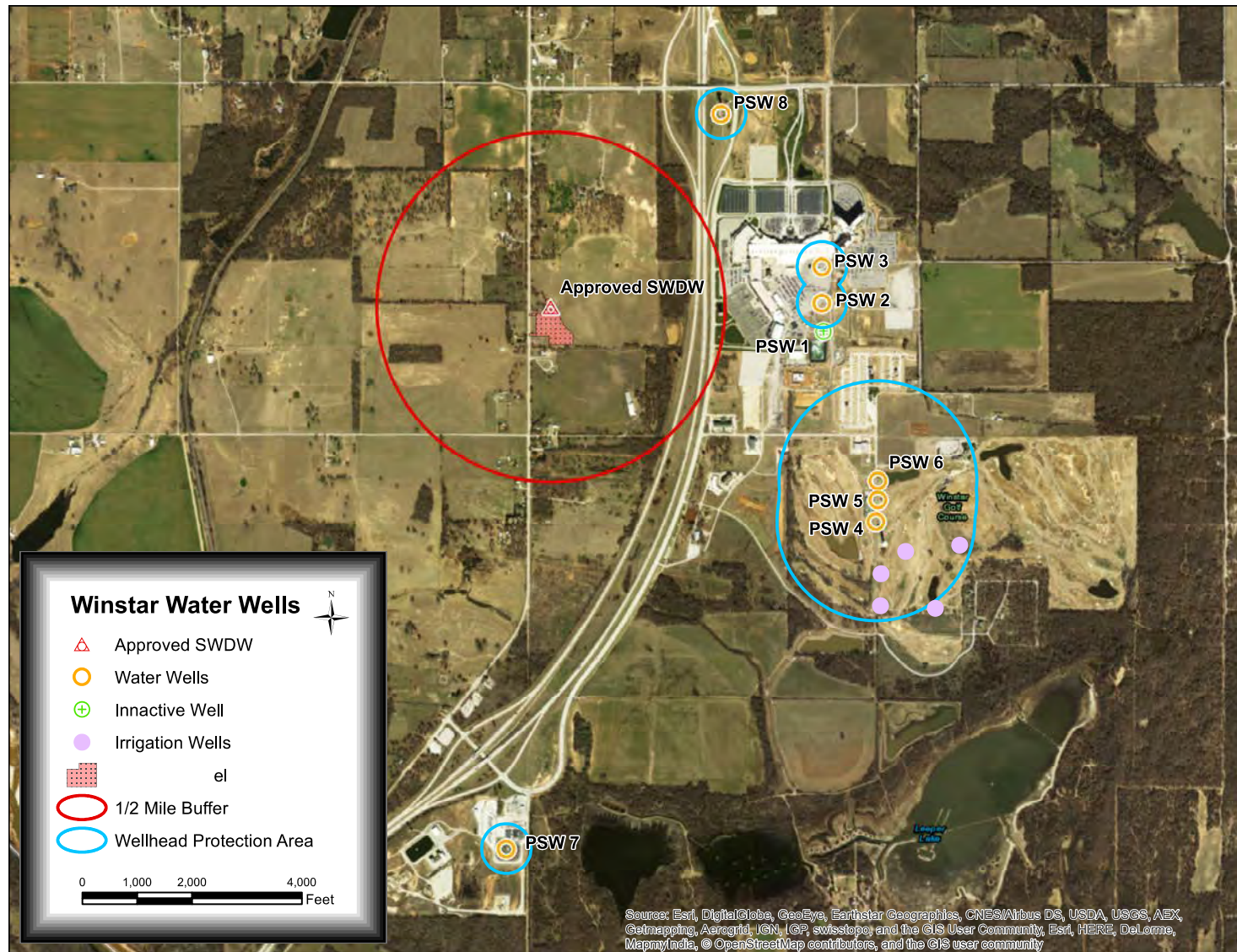
Chickasaw Wellhead Protection Plan

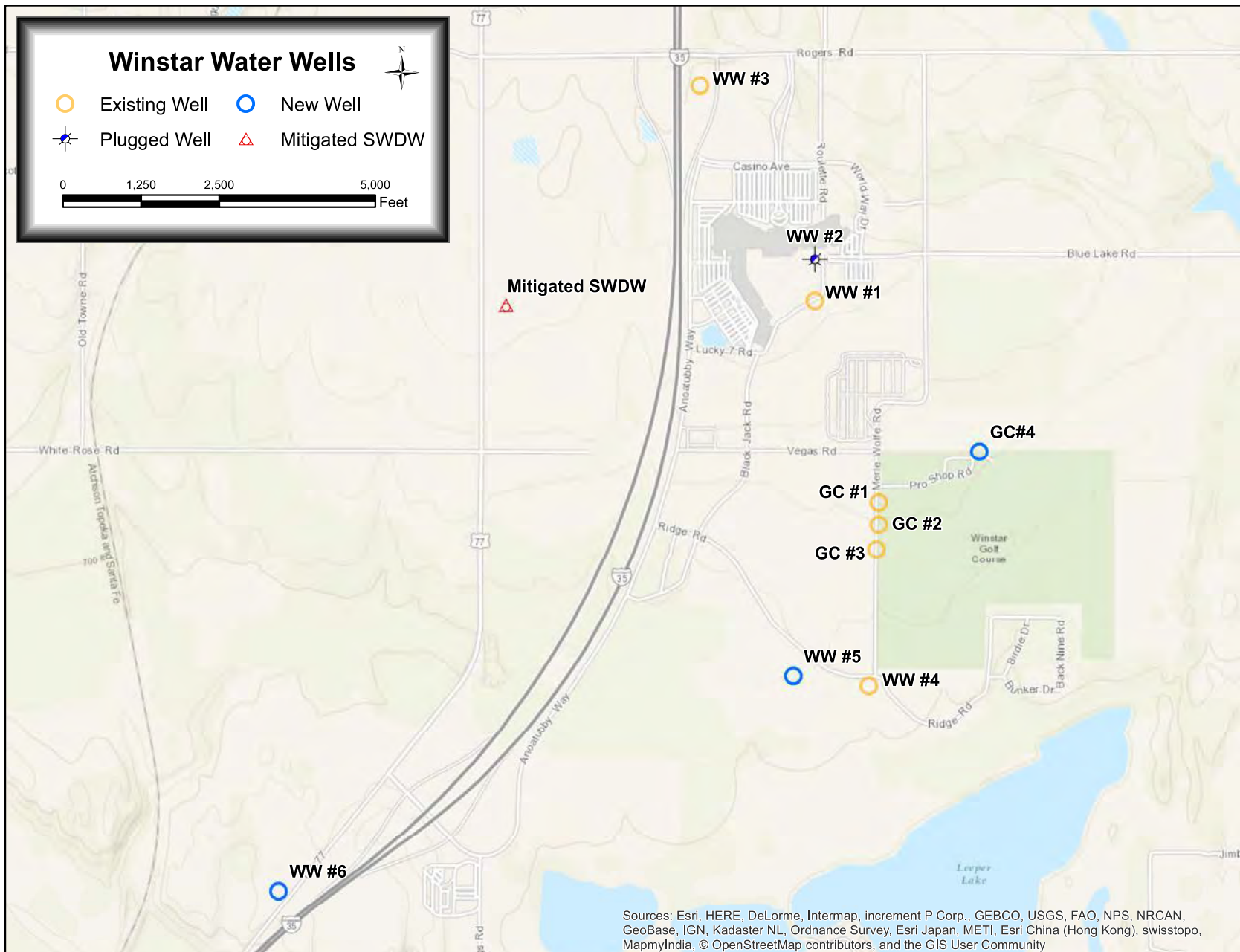
- Chickasaw Wellhead Protection Plan (CWPP), WPP for Winstar since 2003
- Rely exclusively on groundwater from Antlers Aquifer
- Chickasaw Tribal Utility Authority responsible for water delivery and treatment
 - 3.5 million+ visitors per year
- Regulatory primacy, EPA Region VI
- Last updated in 2008

Case Study: Identify

- August 2014: 07 Saltwater Disposal, LLC filed permit application with the Oklahoma Corporation Commission (OCC) to drill, complete & operate a commercial Class II disposal well
 - < ½ mile west of WGC
- OCC grants approval without protest
- Monitoring Legal Notices, OKA', LLC filed application to vacate or modify 07SWD's permit
- After administrative hearing, 07SWD agrees not to proceed pending outcome of formal protest







Discussion

- Disposal well threat mitigated, Summer 2016
- Winstar serves as exemplar to importance of vigilance
- Available update guides broad, too general
- Given prevalence of groundwater use, development of oil and gas resources, a need exists for a stand alone guide
 - Tangible, straightforward guide, quick update
- *Does not eliminate threats*
 - Methodological approach
 - Real-world example

Thank You

- Special thanks to my committee members:
 - Dr. J. Berton Fisher, C.P.G.,
 - *Adjunct Professor, Environmental Science Graduate Program*
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 - Dr. Jason Vogel, P.E.
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 - *Associate Profession, The University of Oklahoma*
- Center for Sovereign Nations
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- Chickasaw Tribal Utility Authority
 - Tim Robertson

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