

Proposed Plan for Area B of the Tucson International Airport Area Superfund Site

Public Meeting

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Executive Summary

- 5 alternatives for remediation were reviewed.
- EPA's Preferred alternative is In-Situ Chemical Oxidation with Potassium Permanganate at 3 sites and Monitored Natural Attenuation at West Plume B site.
- Purpose of the Proposed Plan is to get public input.

Common Acronyms Used in this Presentation

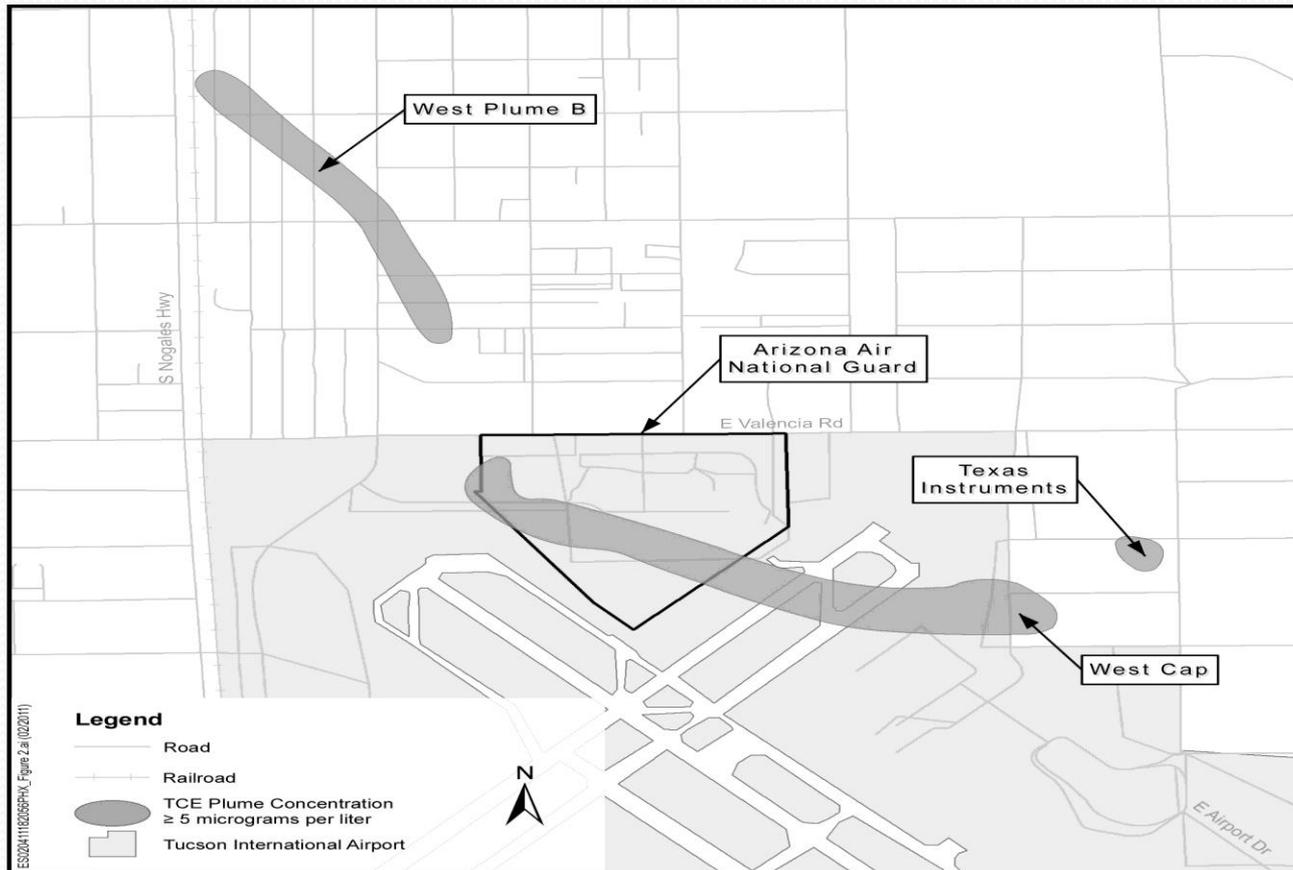
- Acronyms will be used in this presentation to save space on the slide for viewing.
 - AANG – Arizona Air National Guard 162nd Fighter Wing
 - ISCO – In-Situ Chemical Oxidation (a type of groundwater remedy)
 - MNA – Monitored Natural Attenuation (another type of groundwater remedy)
 - ppb – parts per billion
 - TCE – trichloroethylene
 - TIAA – Tucson International Airport Area Superfund site



Public Comment Period is from
October 26 – November 30, 2011

- Verbal comments can be submitted today!

Geographical Orientation of TIAA Area B



West Cap

- Early 1960's – late 1980's was site of manufacturer of small film capacitors and magnets
- Improper disposal of solvents into floor drains
- Company went bankrupt
- Building removed, wells drilled into cement slab
- Highest concentration of TCE in Area B is at West Cap at 970 ppb



Texas Instruments

- Site produced microchips from 1969-2009
- Contamination related to previous disposal practices, especially near chemical storage facility
- Operated pump and treat system from 1992 and 2009
- Highest concentration of TCE at 76 ppb
- Very minor decrease in concentrations of contaminants after 17 years



Arizona Air National Guard 162nd Fighter Wing

- Base became operational in 1956
- Used to train fighter pilots from around the world
- Operations included aircraft and ground vehicle maintenance
- Pump and treat started in 1997, still in operation today
- ISCO pilot study in 2009 results were promising



West Plume B

- AANG successfully stopped migration of contaminants going north from Valencia Road
- There are no known sources of contaminants within West Plume B; sources are upgradient
- Plume has been split from AANG
- Concentrations in West Plume B have decreased over time due to natural processes
- Highest concentration of TCE is less than 15 ppb

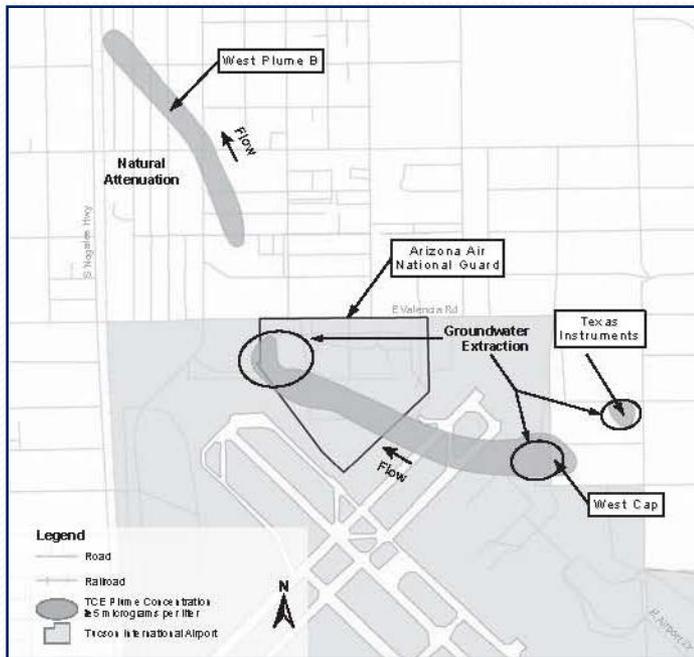
Five Alternatives reviewed in this Focused Feasibility Study

- 1. No Action alternative
- 2. Pump and Treat at 3 sites and MNA at West Plume B
- 3. Potassium Permanganate ISCO at 3 sites with MNA at West Plume B
- 4. Permeable Reactive Barrier at AANG, Potassium Permanganate ISCO at West Cap/Texas Instruments and MNA at West Plume B
- 5. Potassium Permanganate ISCO at West Cap/Texas Instruments and MNA at AANG/West Plume B

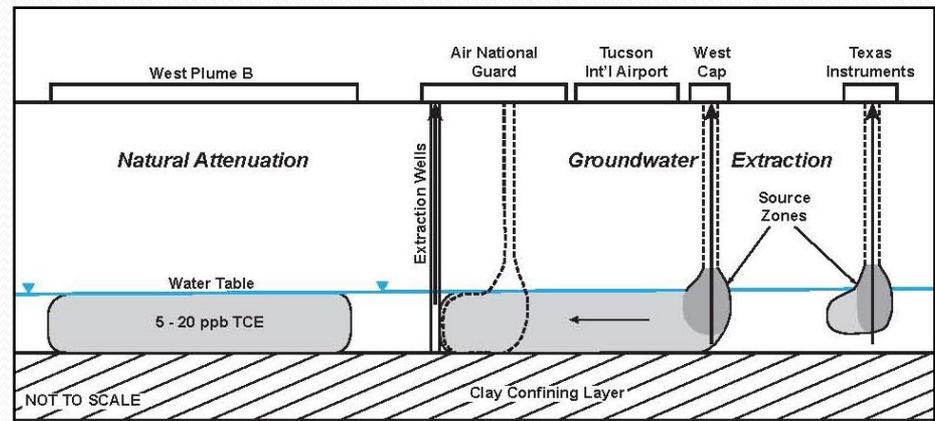
Alternative 1: “No Action” is **required** to be evaluated in Superfund Process

- “No action” alternative can be used to establish baseline
- There are some cases where a “no action” alternative is selected

Alternative #2: Pump and Treat



Plan View



Cross Section View

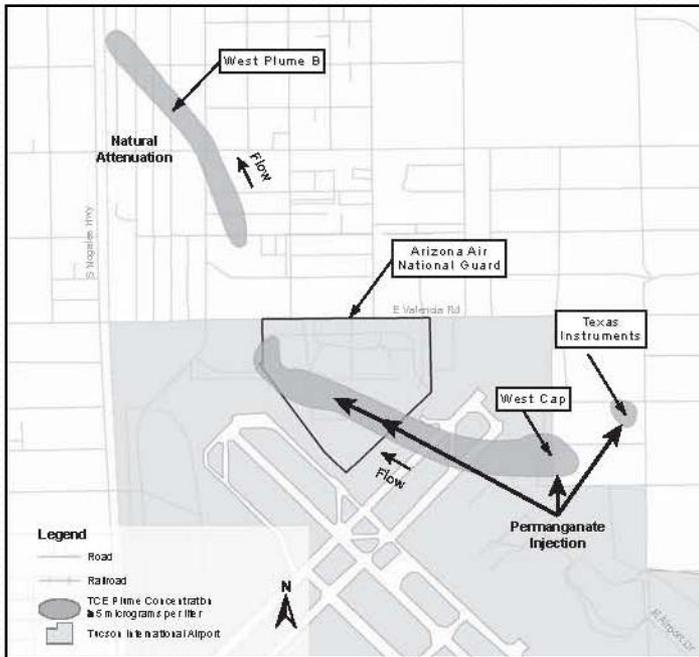
Basics of Pump and Treat

- Most common type of groundwater remedy
- Extraction prevents migration of contamination
 - Important first step in the clean up process
- Treatment is air stripping which removes volatiles
- Streaming air then passes through a series of carbon beds which bonds the contaminants.
 - Carbon beds are replaced when overloaded with contaminants
- Clean water after treatment would be reinjected unless another beneficial use can be found for the treated water.

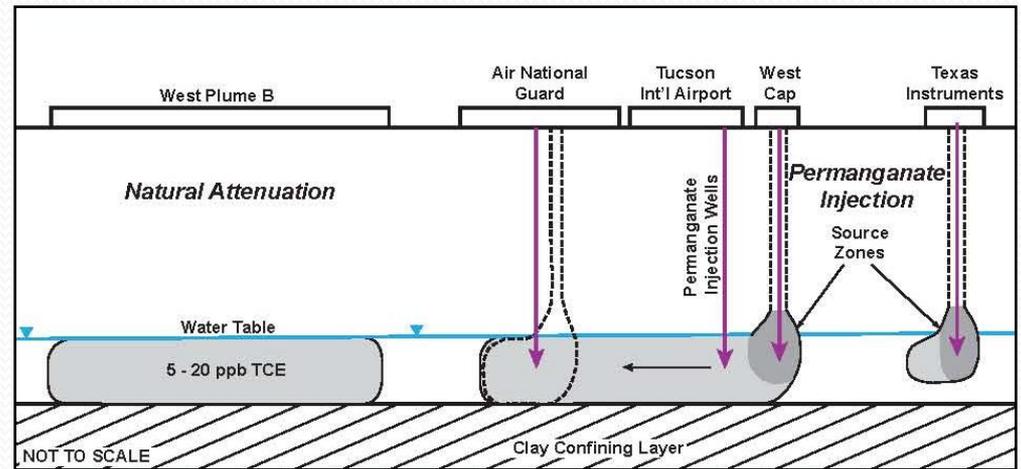
Basics of Monitored Natural Attenuation (MNA)

- Passive treatment which relies on natural biological and/or physical processes.
- Analysis must be performed and approved by EPA HQ
 - Must identify what specific biological/physical properties break down contaminants
 - No simple dilution
- An analysis for West Plume B was completed and approved by EPA HQ.
- Critical that no source areas are present

Alternative 3: ISCO with Potassium Permanganate



Plan View

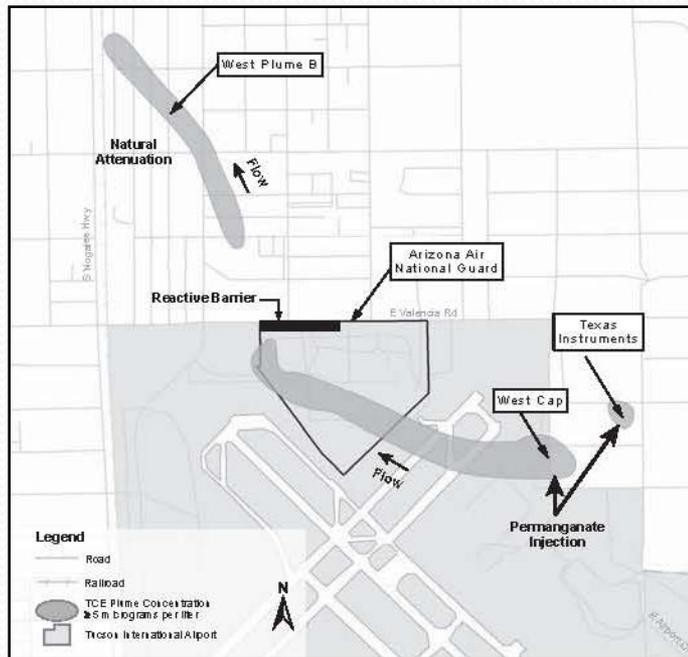


Cross Section View

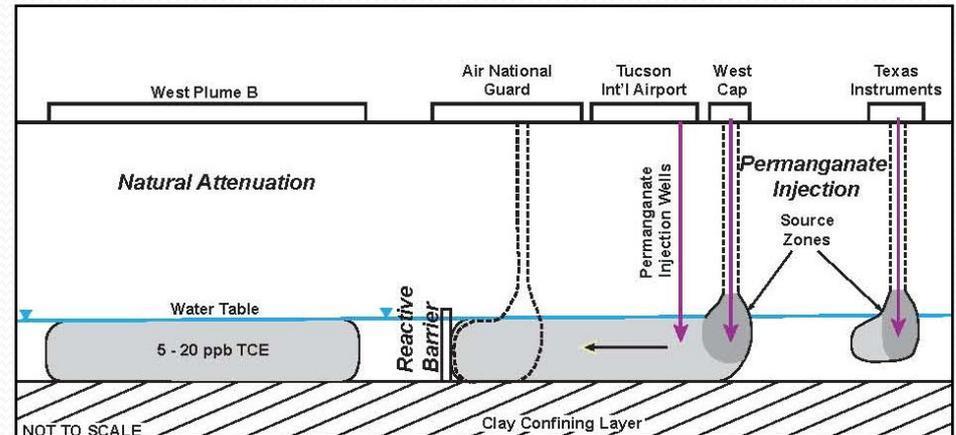
Basics of ISCO

- ISCO treats the water in the ground
- Pump and treat is difficult process when the “source” of the contamination is in clay areas
- ISCO uses the oxidant – potassium permanganate – which needs to make contact with the source zones.
- ISCO must address all contaminants
- Treatability study used to show that you have made contact
 - In Area B, reduction in concentrations of demonstrates that contact of the oxidant with the source zone was achieved.

Alternative 4: Permeable Reactive Barrier at AANG, ISCO at West Cap/Texas Instruments



Plan View

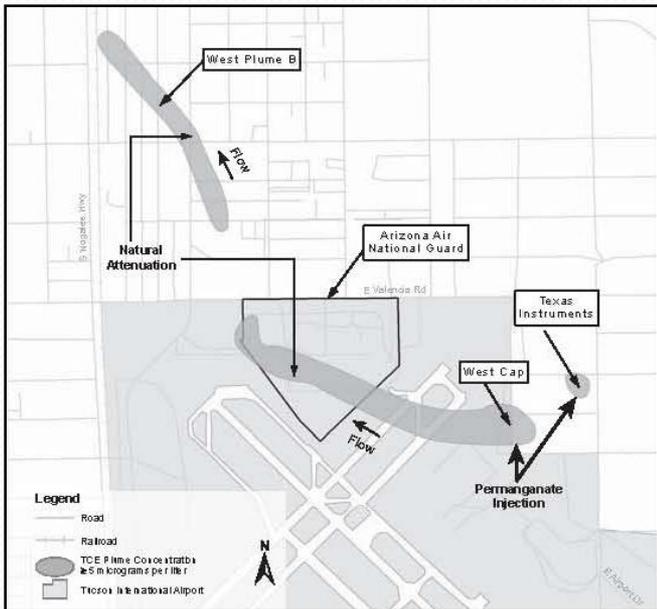


Cross Section View

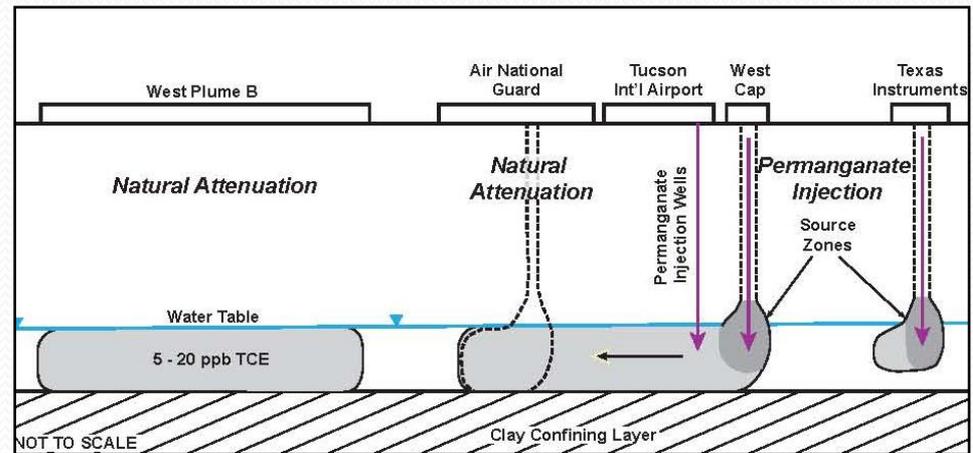
Basics of Permeable Reactive Barriers

- Permeable Reactive Barriers is another emerging new type of remedy in place of pump and treat.
- Groundwater is treated through a chemical or biological fence oriented which is oriented perpendicular to the flow.
 - Proposed specific barrier here is zero valent iron.
- No treatability study for the Permeable Reactive Barrier in TIAA Area B has been performed

Alternative 5: ISCO at West Cap/Texas Instruments and MNA at AANG/West Plume B



Plan View



Cross Section View

Summary of Alternatives

Alternative	Time to Clean Up	Total Cost
No Action	Not applicable	\$0
Pump and Treat	30+ years	\$18,952,502
ISCO in 3 sites, MNA in West Plume B	13-20 years	\$7,421,369
Permeable Reactive Barrier in AANG, ISCO West Cap/Texas Instruments, MNA in West Plume B	20 years	\$19,690,456
ISCO in West Cap/Texas Instruments and MNA at AANG and West Plume B	13-20 years	\$5,927,442



Superfund Requires Review of All Alternatives Using 9 Criteria

Evaluation Criteria #1: Overall Protection of Human Health and the Environment

- Alternative #1: the “No Action” Alternative does not meet the evaluation criteria for overall protection of human health.
 - Risk for contracting cancer exceeds the Superfund acceptable risk range.
 - “No Action” is removed from further consideration
- Other 4 Alternatives reviewed in this Proposed Plan satisfy evaluation criteria #1.

Evaluation Criteria #2: Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

- Alternatives 2-5 would comply with the applicable or relevant and appropriate requirements.

Evaluation Criteria #3: Long Term Effectiveness and Permanence

- Alternatives 2-5 are effective would maintain protectiveness of human health
- Alternative 5 is less effective than the other alternatives as it does not prevent migration of contaminants which “could” effect the MNA in West Plume B.

Evaluation Criteria #4: Reduction of Toxicity, Mobility, or Volume of Waste

- Alternative #2 Pump and Treat would not be effective in West Cap and Texas Instruments as groundwater extraction not effective in clays where source zones are located.
- Alternative #3 and #4 would be effective preventing migration from AANG and effective in treating source zones.
- Alternative #5 would treat source zones at West Cap and Texas Instruments but would not stop mobility of contaminants at AANG .

Criteria #5: Short Term Effectiveness

- Potential for exposure to site workers of potassium permanganate will be controlled through safety precautions.
- Potassium Permanganate will be calculated to degrade before it reaches north of Valencia Road so no exposure to community.

Criteria #5: Short Term Effectiveness (cont.)

- For alternatives 3 and 4, treatment of contaminants in source zones would occur within 3 years.
- Alternative 4 is effective if current AANG pump and treat is continued during construction of permeable barrier.
- Alternative 5 is not effective in the short term for AANG because contaminants could be migrating to West Plume B

Evaluation Criteria #6: Implementability

- Alternatives #2 and #3 have been implemented as a remedy or pilot test in TIAA Area B.
- There has not been any pilot test of the Permeable Reactive Barrier in TIAA Area B and implementability is uncertain.
- Alternative #5 would require some additional monitoring wells and would be similar to Alternative #3.

Evaluation Criteria #7: Cost

- Alternative #5 is the most cost effective as it relies heavily on natural processes.
 - Total cost for Alternative #5 is approximately \$5.9 million.
- The estimated total cost for Alternative #3 is approximately \$7.4 million.
- Alternatives #2 and #4 are the least cost effective with estimated costs at \$19 million.

Evaluation Criteria #8: State Acceptance

- Arizona Department of Environmental Quality has reviewed the Proposed Plan and prefers Alternative #3 with ISCO for West Cap, Texas Instruments, and AANG and MNA for West Plume B
 - It is expected that the State will provide written comments on any EPA decision document and EPA Remedial Design documents.

EPA's Preferred Alternative is #3: ISCO with MNA in West Plume B

- After review of the 8 evaluation criteria, Alternative #3 is the preferred remedy.
 - In summary, it is a known implementable remedy that reduces environmental risk sooner at a reasonable cost.
- EPA is seeking public comment to evaluate criteria #9: Community Acceptance.
 - All of the comments will be addressed in the Responsiveness Summary in the EPA Record of Decision Amendment.



EPA will now take verbal comments that will be recorded and included in the Responsiveness Summary

- You are welcome to take copies of written form for comments and fill it out here for us to take today or mail it to address provided.