



Diné Network for Environmental Health Project and Church Rock Uranium Monitoring Project

Church Rock Report

Chapter Meeting Presentation, Aug. 20, 2006

Community Meeting Presentation, Aug. 27, 2006

(revised March 2007)

Soil Sampling Assessment

presenters:

Christine George, Stanford Univ.

Dr. Johnnye Lewis, UNM

Chris Shuey, SRIC

DiNEH Project Collaborators:

Church Rock Uranium Monitoring Project

Eastern Navajo Health Board

UNM-Community Environmental Health

Southwest Research & Information Center

Stanford University

Tufts University

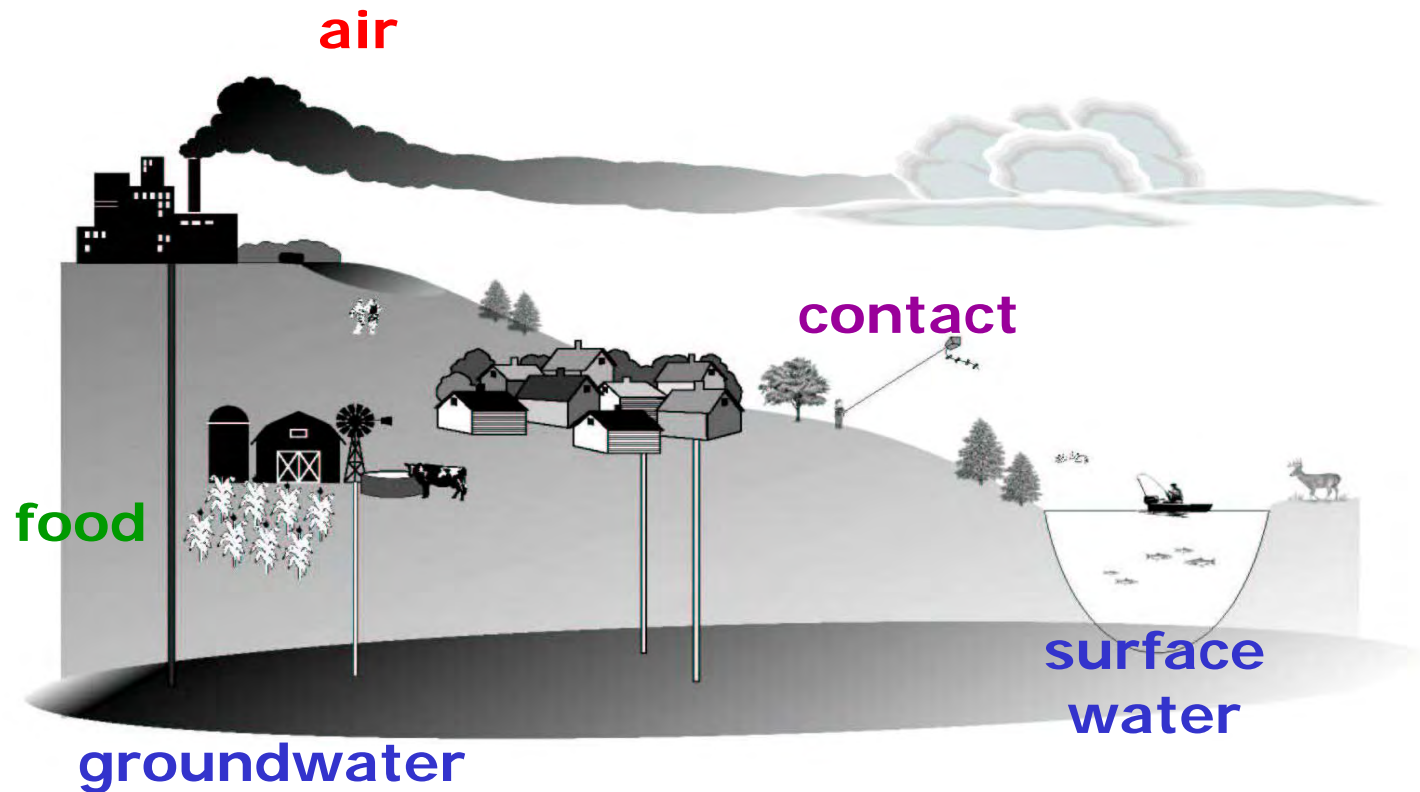


Purposes of Presentation

- Present Results of Soil Sampling
 - Establishing what is normal uranium levels for the area
 - Uranium in soils in Church Rock and surrounding Chapters
 - Exposure from Soils
 - Recommendations



Multiple Routes of Exposure

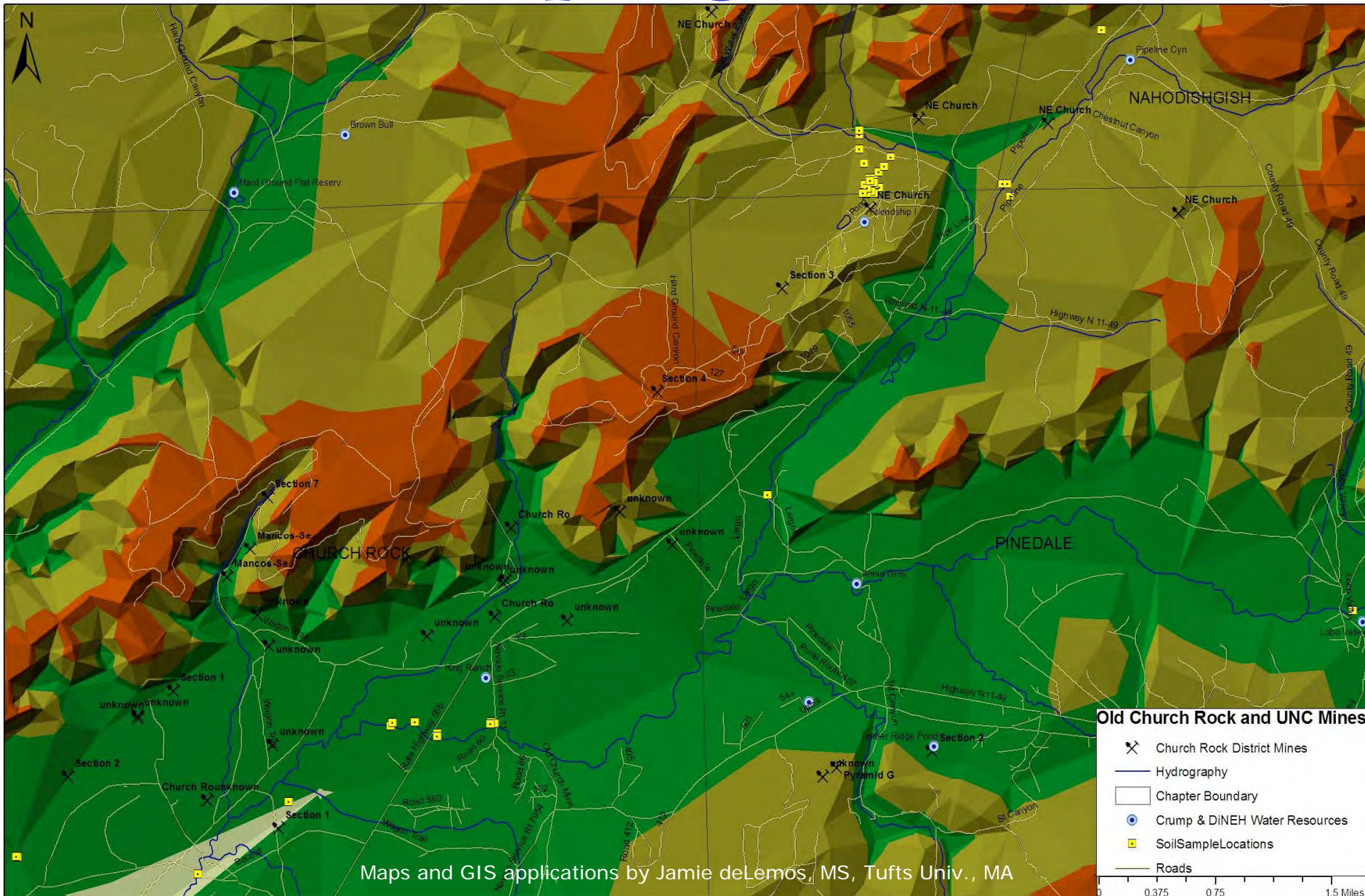


Soil Sampling

□ Soil Sampling Sites

- Red Water Pond Road (Coyote Canyon)
 - next to UNC Northeast Church Rock Mine (impacted area)
 - arroyo upstream of community (non-impacted area)
- Pipeline Road Arroyo
- Old Church Rock Mine Road
- Pinetree Spring Well (Lime Ridge)
- Springstead Loop Arroyo
- Becenti Trail
- Rio Puerco 566 Overpass
- Standing Rock Residence
- Lobo Valley Road/North Fork, Puerco River (Pinedale)
- Exploration Markers, Dalton Pass (Nahodishgish)

Soil Sampling Locations



What is “Normal”?

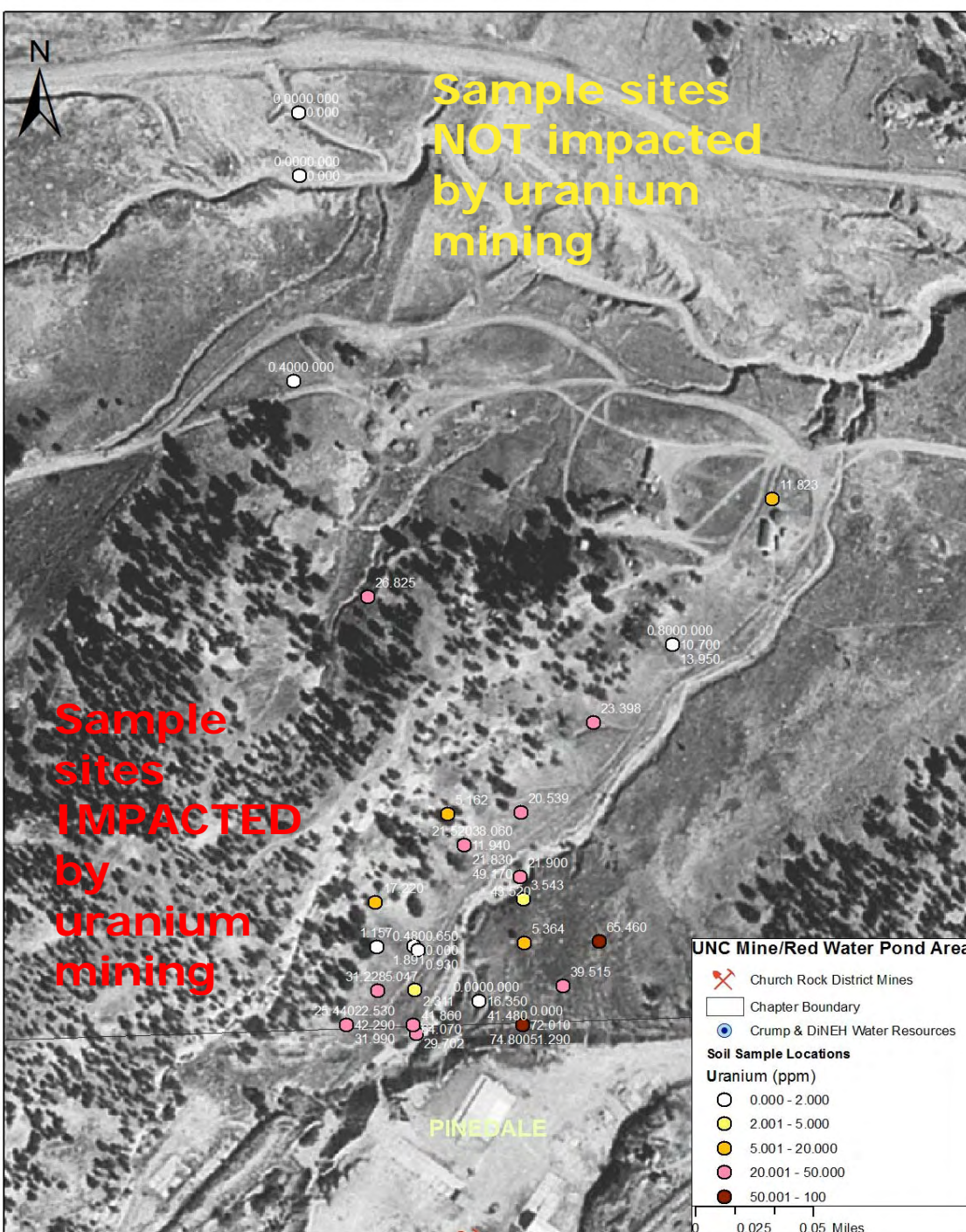
- Normal — what occurs naturally in the environment
- Background — another word for normal or natural; without human impact
- How do we find out?
 - Collect and analyze samples of soil, air, and water
 - Observe the environment
 - Mines, Mills, Refineries, Gas Stations, Landfills, Sheep Dip Vats our examples of things that are not natural

What is “normal” uranium in the area?

- Uranium Range 0.3-1.5 ppm
 - Becenti Trail
 - Standing Rock Residence
 - Non-Impacted Red Water Pond Rd
 - Pinedale Residence
 - Red Water Pond Rd Residence
 - Lobo Valley Rd/Rio Puerco
- Agrees with the literature values for uranium averages in soils
 - U levels >5 ppm likely result of human activities
 - USEPA Preliminary Remediation Goal (PRG) = 16 ppm U

Red Water Pond Road

- Sampled in December 2004 and Summer 2005



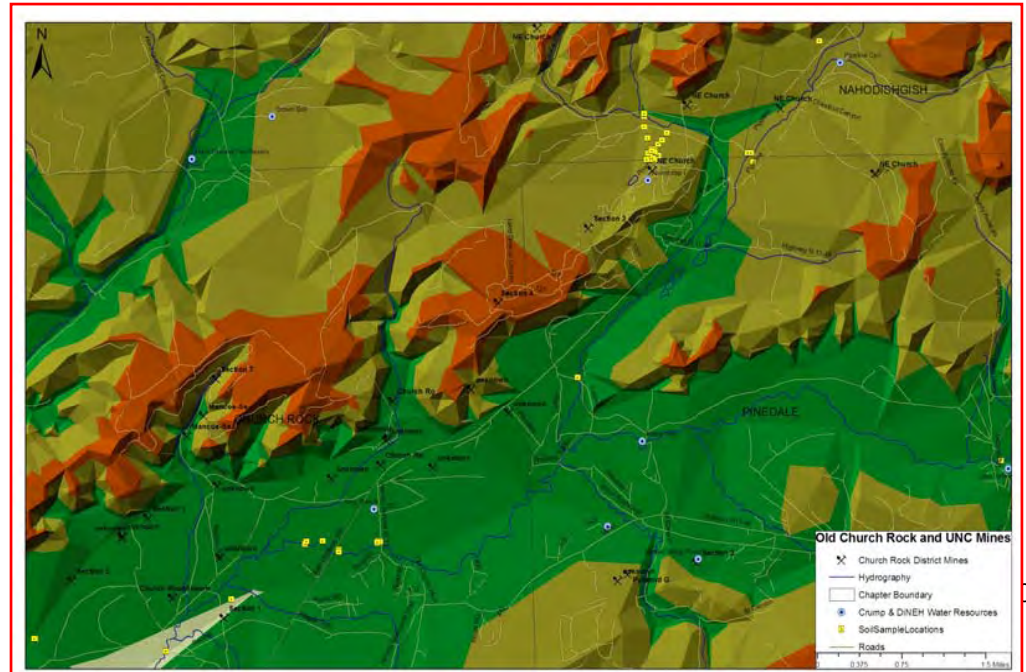
Uranium-soil results at Red Water Pond Road

- 50 soil samples in RWPR area:
 - Uranium range: 2-89 ppm
 - Average: 24 ppm —16X higher than local background (1.5 ppm-U)
 - 80% samples > 1.5 ppm
- High U levels found up to 36" deep, at 2,100' from mine waste dump
 - U in soil decreases with distance from mine wastes
- Children seen playing on mine site, swimming pool seen the in mine-water arroyo



Uranium-soil results at nonimpacted and potentially impacted sites

Soil Sampling Site	Uranium ppm
Old Church Rock Mine Rd	0.5-0.7
Pinetree Spring Well (Lime Ridge)	0.9-2.6
Springstead Loop Arroyo	0.5-1
Red Water Pond Road Residence	0.4
Rio Puerco 566	.7-.2



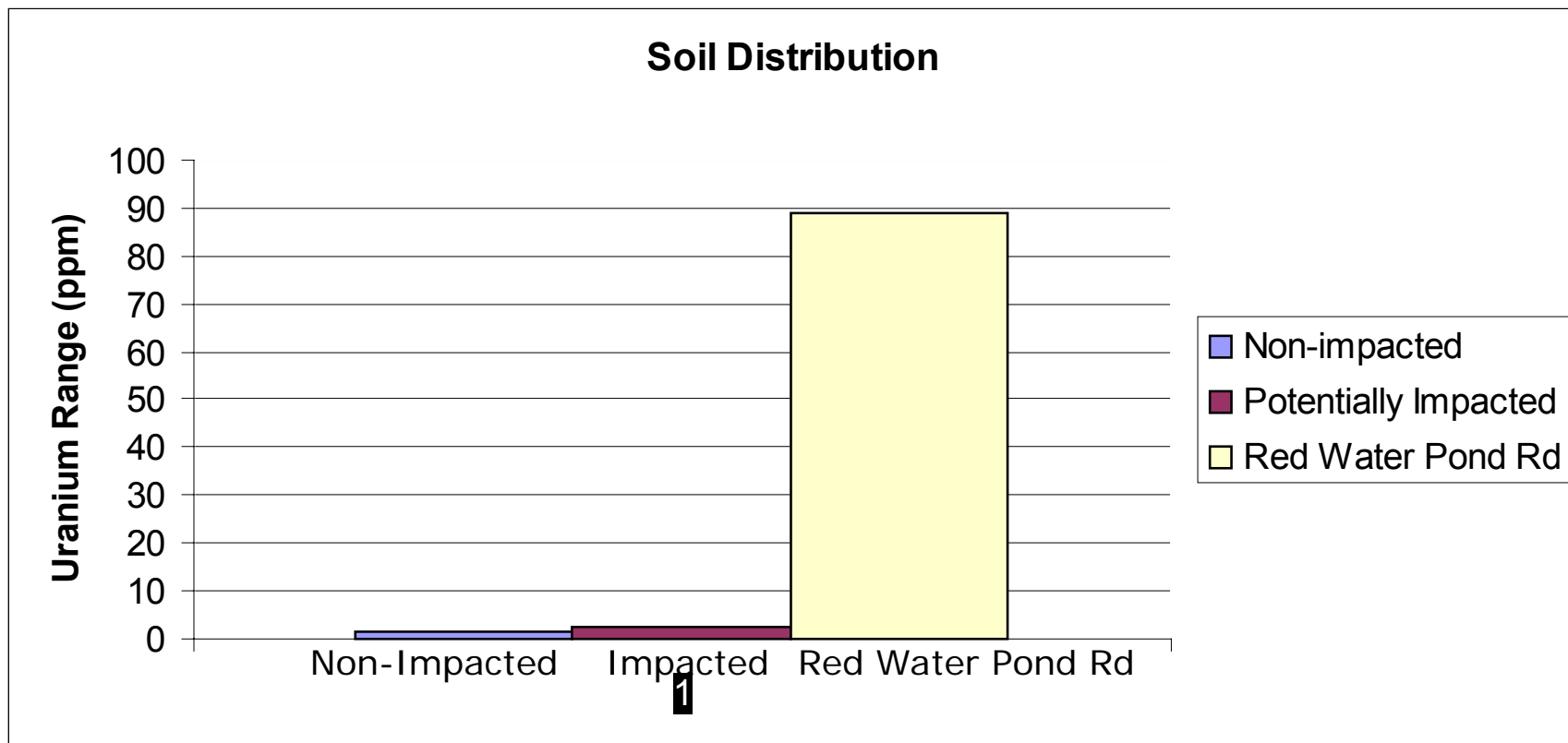
Soil Sampling Sites

- Several sites had elevated levels of other elements

Soil Sampling Sites	Elevated Elements		
	Iron	Arsenic	Nickel
Red Water Pond Rd	X		X
Pipeline Rd Arroyo			X
Red Pond Rd Residence			X
Becenti Trail	X		X
Pipeline Rd Residence	X		X
Standing Rock Residence			X
Exploration Marker Dalton Pass	X		X
Non-Impacted Red Water Pond Water		X	X

- Arsenic and Nickel are known to effect kidney health

Uranium in Soils



Soil Exposure

- Possible Exposure Routes from Soils
 - Soil Ingestion
 - Windblown Dust
 - Inhalation
 - Homegrown produce
- What is soil ingestion?
 - Soil ingestion is when soil is consumed, or eaten. This can be from children playing outside in the dirt and putting their hands or objects to their mouth. Adults also ingest small amounts of soil while working outside, through windblown dust, on food, or from hand to mouth contact.

Soil Ingestion

- ❑ Children have a higher potential for exposure than because they play outside
- ❑ Those individuals that frequently work outside in areas with higher uranium in the soil are at an increased risk of exposure
- ❑ Average intake of uranium from food sources in the US each year is between .27 to .36 mg/year
- ❑ However, for a child living on the Red Water Pond Rd site, average exposure would be much higher, possibly in the range of 2.27 to 2.36 mg/year, and 1.27 to 2.36 mg/year for an adult

Recommendations

- Advocate for clean up of abandoned mine sites and contaminated soils around them
- General Recommendations
 - Do not let children play on or near mining sites
 - Reduce time outdoors during strong winds
 - Wash hands after working or playing outside, and before eating
 - Discourage children from digging in sandy arroyo bottoms
 - Wash vegetables and fruit before eating