



## **Appendix F**



### **Summary of Results Pictorial**





TRIBAL ASSOCIATION FOR SOLID WASTE &amp; EMERGENCY RESPONSE

## Hazardous Waste Sites on Tribal Lands



### **A Summary of Results from the 2004 Tribal Hazardous Waste Sites Project**

*developed by*

**Zender Environmental Science and Planning Services**

The purpose of this one-year Project was to assess the overall national situation of hazardous wastes sites on, or next to, Tribal Lands, and to describe the risks to Tribes that the sites pose. Sites were identified through federal databases, agency websites, and 115 Tribes responded to a survey, that included questions about risks to Tribal lifestyles. We compiled this information into the Tribal Hazardous Sites Registry (THSR), a new database for Tribes. Descriptive statistics are provided on the following pages....

## How many sites are there?

- ✓ Over 15,000 hazardous sites and facilities that present potential risks to Tribal lifestyles were identified<sup>1</sup>.
- ✓ 979 of these sites are Superfund sites
- ✓ 582 are hazardous waste facilities
- ✓ 1,104 are open dumps
- ✓ 7,884 are mines
- ✓ 4,075 are Leaky Underground Storage Tanks
- ✓ 320 are Formerly Used Defense sites
- ✓ At least 33 are Brownfields - 88 are newly identified sites or site groups from this project



## Do they affect Tribal lifestyles?

- ✓ Yes, 57% of responding Tribes have changed their subsistence activities due to concerns about a hazardous site<sup>2</sup>.
- ✓ And 52% of responding Tribes have changed other cultural/traditional activities, such as performing ceremonies, making baskets and other art/tools, and making traditional medicine, because of their concerns about a site.

## How is subsistence affected?

- ✓ 43% of Tribes changed *where* they hunt, fish, and gather foods
- ✓ 27% changed *how often* they performed these activities
- ✓ 34% changed *how much* traditional food they ate
- ✓ 39% changed *what types* of traditional food they ate
- ✓ 30% of Tribes have had a subsistence activity *stop altogether*.



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## How are other traditional activities affected?

- 40% of Tribes changed *where* their traditional lifestyle activities take place
- 28% of Tribes changed *how often* they performed their traditions
- 27% changed *the way* their traditional activities are done
- 26% of responding Tribes have watched at least one traditional activity *stop altogether*.



## THSR Site Characteristics

### Is the number of sites different for each EPA region?

Yes, each region had very different site numbers:

Region:	1	2	4	5	6	7	8	9, Ex. NN*	NN*	10, ex. AK	AK
Sites:	345	165	233	1,309	1,230	102	2,079	4855	1246	2,499	1,216

\*NN=Navajo Nation

### Do different Regions deal with different site types?

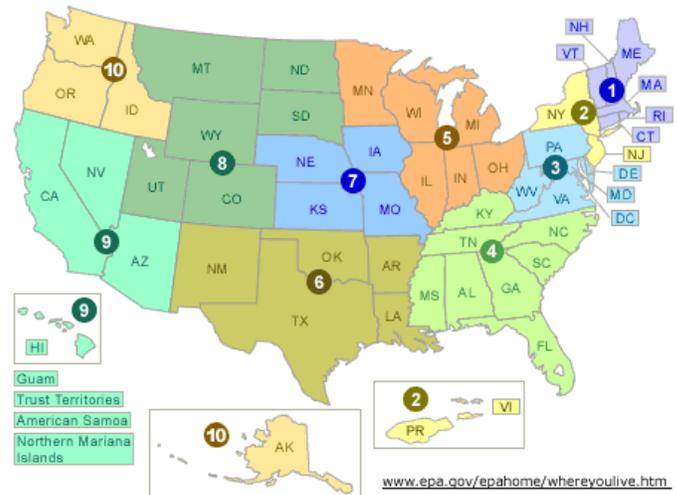
Yes, **Region 1** had only one IHS site, and 80% of their sites were LUST sites,

but only 17 % of **Region 2's** sites are LUSTs. At 34%, Region 2 had the highest proportion of their sites as RCRA facilities. but at 5%. not very many of their sites were Superfund sites.

At less than 3%, just 6 sites, an even smaller portion of **Region 4's** sites were Superfund. Like Region 1, the most common site type there were LUSTs, comprising 42% of their sites. But at 32%, or 75 sites, Region 4 also had a sizeable portion of Mine (MAS) sites.

Just 1.1% of **Region 5** sites were CERCLIS types, the lowest portion of CERCLIS sites of all the Regions. But at 69%, Region 5 had the 2<sup>nd</sup> highest portion of LUST site.

Although they comprised only 14% of **Region 6's** sites, at 166, Region 6 had the second highest number of Superfund sites. But, at 59 %, the most common site type was a mine.



Like Regions 1, 4, 5, and Alaska, the most common site type in **Region 7** was a LUST. But, at 28% of their sites, Region 7 also had the highest proportion of IHS sites

With a full 77% of their sites being mines, **Region 8** had the highest proportion of that type, and at less than 1%, the lowest proportion of RCRA facilities except Alaska.

**Region 9**, had the highest number of RCRA sites by far, as well as the highest number of IHS sites, at 319. But with or without Navajo Nation, the biggest share of sites in **Region 9** are mines, at about 57% in either case.

Likewise, at 1,300 in number, the bulk of **Region 10** sites are mines, *excluding Alaska*. And at 175, Region 10, without Alaska, has the second highest number of CERCLIS sites.

**Alaska** was the only region with no RCRA sites. But at 143 and 151 respectively, it has a relatively high number of Superfund and IHS sites.

### In at least 91% of Tribes, some number of Tribal members practice traditional activities<sup>3</sup>:

While activities differed, Tribes in the Lower-48, as a group, listed nearly the same numbers and proportions of traditional activities as Alaska Native Villages.<sup>4</sup> Of course, these practices differed among regions.

#### The top three activities in Alaska are:



- ✓ 94% of Tribes listed hunting and fishing
- ✓ 66% of Tribes listed gathering and everyday use of plants
- ✓ 68% of Tribes listed smoke houses

#### In the Lower-48, the most prevalent activities are:



- ✓ 68% of Tribes listed hunting and fishing
- ✓ 63% listed powwow activities
- ✓ With a tie at 56 % for:
- ✓ Ceremonies with smoke (fire, sage, etc), Gathering/using of plants, and Farming and growing



NPS, Cultural Resources [www.nps.gov](http://www.nps.gov)

**But about 58% of hazardous sites impact subsistence practices substantially, with concerns from 80% of those sites changing where Tribes hunt and fish. Similar, but slightly lower numbers, are true for other traditional activities.**

**These are high numbers. But what is striking is that traditional activities continue even at sites that are significantly contaminated:**



- ✓ 71 % of Tribes reported that traditional activities take place on, or next to, the site of concern
- ✓ 58% of Tribes reported members consume fish, game, plants contaminated by a site
- ✓ 33% of Tribes reported that at least some Tribal members continue to drink *untreated* water from streams with site drainage, (i.e. traditional drinking of water
- ✓ Traditional activities were conducted in, or next to, water contaminated by 68% of reported sites.



Steam bath

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### **Why? Because Tribes value their traditions and traditional lifestyles:**

In a related study, compared to non-Tribal persons, Tribal members were substantially less likely to trade off their traditions in exchange for tangible physical benefits such as contaminant-free foods and environment, and short- and long-term physical health<sup>5</sup>.

### And traditional activities can be affected in ways that don't depend on physical contamination:

- ✓ Even when traditional activities took place away from the site and site-contaminated water, 58% of Tribes *still felt these activities were impacted by the sites*.
- ✓ Even if a tradition continues to be performed at the same level *how* it is performed matters greatly. In one study, 76% of Tribal members thought it very important, compared to only 20% for non-Tribal people.<sup>6</sup>
- ✓ For about one-third of sites, Tribes reported traditional activities being impacted-- not by decreasing in frequency or changing location, but by how the activities were performed and the sociability they provided.



### What Do We Know About The Priorities Of Tribes In Addressing Hazardous Sites And Facilities?

Heavy metals, particularly lead and mercury from various sources, were cited to be of greatest concern about 50% more often than petroleum hydrocarbons, the 2<sup>nd</sup> most frequently listed contaminant.

### And Contaminant Concerns Appear to Differ Regionally

In Alaska, the 3<sup>rd</sup> highest number of concerns was registered for asbestos, and in the Lower 48, it was for dioxins.

### What Types of Sites Are of Concern?

We aren't certain, but the site types for which Surveys were most frequently submitted were:

- ✓ Open dumps at 16% to 19% of Survey sites
- ✓ Military waste sites at 12%
- ✓ And Petroleum product-only sites; Sites fitting RCRA small facilities criteria; and sites where wastewater and sewage were of concern at 9% to 10% of Survey sites.



### And that varied regionally:

- ✓ In the Lower-48, the most Surveys were submitted for small facilities (14%), open dumps (10% to 16%), and mines & mining sites (10%).
- ✓ In Alaska, the most Surveys were submitted for Village open dumps & landfills (36%), military sites (22%), and then petroleum-only sites (10%).

## What Types of Traditional Activities took place on or near Survey sites?

### The top three are:



Hunting and fishing	70%
Plant harvesting	58%
Ceremonial/spiritual activities	47%

### Are any short-term health risks associated with the sites?

In a scientific study, Tribal members experienced dizziness, stomach upset, diarrhea, sore throat, cough, and headache an average of between *5 to 10 times more* if they had been at or next to a hazardous site in the past 10 days<sup>8</sup>.

### In terms of Tribal Priorities, Traditions Matter, Size Alone Probably Doesn't.

The size of sites that Tribes reported as being of concern varies greatly. Half of sites are less than two acres, but about one-third of sites are over 2,800 acres.



### Does Tribal jurisdiction play a role in Tribal Site Priorities?

We don't know for certain. But we do know that Tribes are concerned about lands outside their Reservations and Villages, including customary use and aboriginal lands. For Lower-48 Tribes:

- ✓ 35% of Survey sites were off-Reservation.
- ✓ At 40%, the most common land status for Survey sites was on-Reservation trust land
- ✓ 12% of Survey sites were off-Reservation, and reported as "not Tribal Related"
- ✓ Treaty hunting and fishing (Off-Reservation) and Fee Lands (On-Reservation) tied at 4% of sites.
- ✓ 26% of sites were marked as "Other" land status types, and about half of those were on- and half were off-Reservation.

#### Endnotes:

- <sup>1</sup> Site numbers and types are derived from compilation of a number of federal databases, website lists, and Tribal survey responses.
- <sup>2</sup> Responding Tribes refers to Tribes that responded with concern over a site(s) to the "THSR survey" developed and distributed for this project. See Final Report Appendix A for response rates and representation discussion.
- <sup>3</sup> Including three AK Tribes who were known to practice traditional activities, but did not answer questions. The number is conservative because for Tribes who did not mark traditional activities, it was not possible to confirm that traditional activities were indeed absent.
- <sup>4</sup> The proportion and number of Tribal members practicing the activities was not examined, but is expected to differ considerably among Regions and individual Tribes.
- <sup>5</sup> See Intangible Risk Section description of unpublished Zender Environmental study, or [www.zender-engr.net](http://www.zender-engr.net).
- <sup>6</sup> Fishers exact test P value = 0.026. A group of 17 Tribal environmental representatives from 5 EPA regions, 25 to 65, and a group of 21 Caucasian persons living in 4 EPA regions, took a set of parallel questions intended to elicit familiarity with subject matter and values discussed. For example, "elder" was replaced by "senior citizen".
- <sup>7</sup> Within one standard deviation of mean, approximately 68% of Tribes. See Report Appendix A for details.
- <sup>8</sup> See Final Report Appendix E for details. The technique employed is the that developed and discussed in. Gilbreath, S. Health Effects Associated with Solid Waste Disposal in Alaska Native Villages, in Graduate Group in Epidemiology. 2004, University of California, Davis: Davis.