Kennecott North Facilities Remediation

Stakeholder Forum Overview

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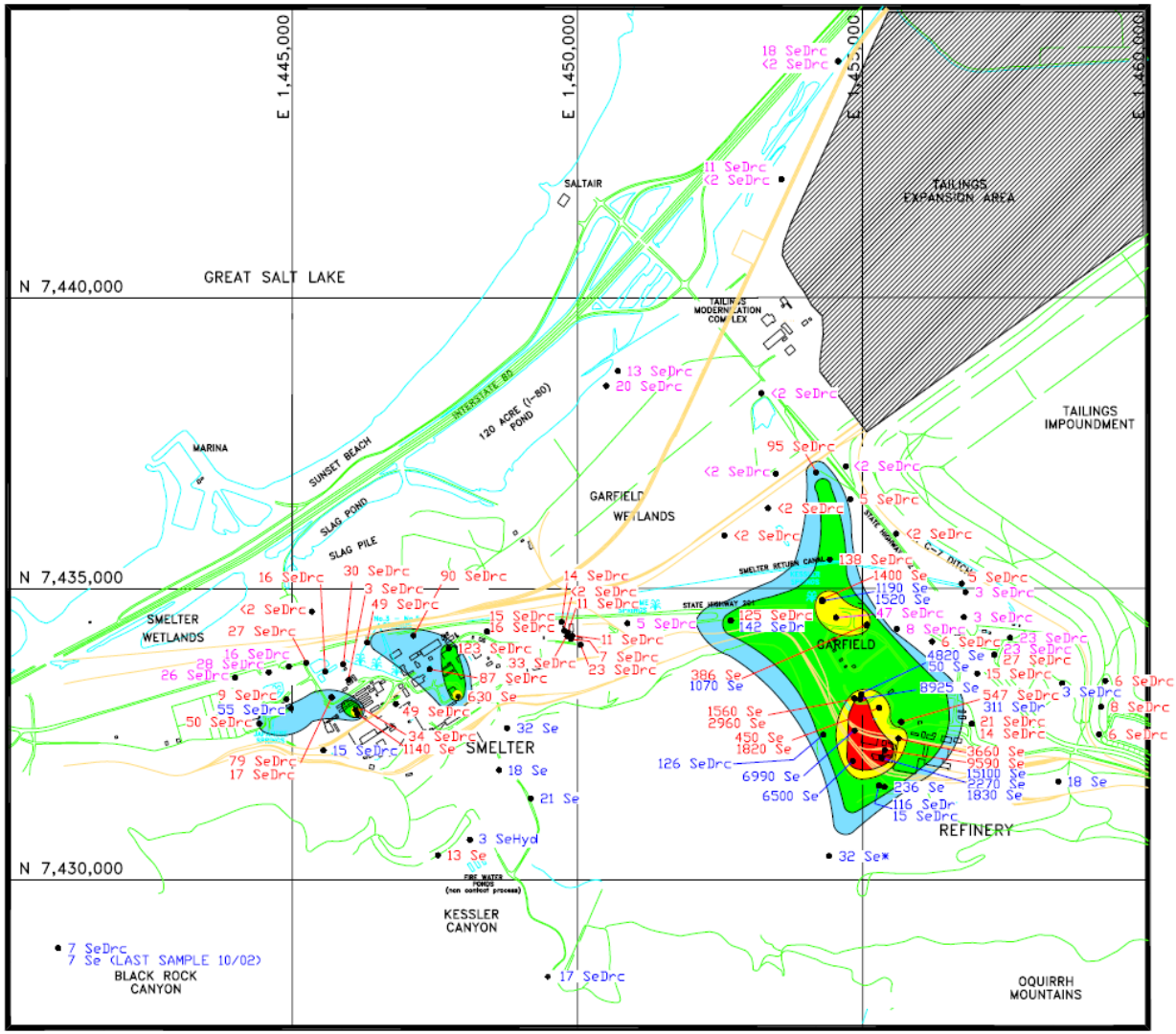
GREAT
SALT
LAKE
I-80
TAILINGS
IMPOUNDMENT
WETLANDS
SMELTER
KENNECOTT
TAILINGS
IMPOUNDMENT
REFINERY
HWY 201
NORTH
CONCENTRATOR
MAGNA

CERCLA History

- Site proposed for NPL listing in 1994
- MOU in 1995 between EPA, State of Utah, and Kennecott
- Groundwater RI/FS completed 2000
- ROD issued 2002
- RD/RA in preparation
- Consent Decree anticipated in 2006

ROD Selected Remedy

- Groundwater
  - Capture contaminated groundwater
  - Utilize in-situ methods for selenium plume
- Wetlands
  - Monitor water, sediments, and macro invertebrates for selenium and other contaminates of concern
  - Remediate any additional sources
- Facilities
  - Demolish unneeded facilities (North Concentrator, Bonneville, Precipitation Plant)
  - Remediate soils as needed



EXPLANATION

- <2 LACUSTRINE AQUIFER
- <2 GRAVEL AQUIFER
- <2 BEDROCK AQUIFER

SeHyd ANALYSIS PERFORMED USING THE SELENIUM HYDRIDE METHOD

SeDrc ANALYSIS PERFORMED USING THE DYNAMIC REACTION CELL METHOD

Se ANALYSIS PERFORMED USING THE ICP METHOD

- SELENIUM CONCENTRATION > 5000 ug/l
- SELENIUM CONCENTRATION 1000–5000 ug/l
- SELENIUM CONCENTRATION 100–1000 ug/l
- SELENIUM CONCENTRATION 50–100 ug/l

N

GRAPHIC SCALE

0 1000 2000 4000

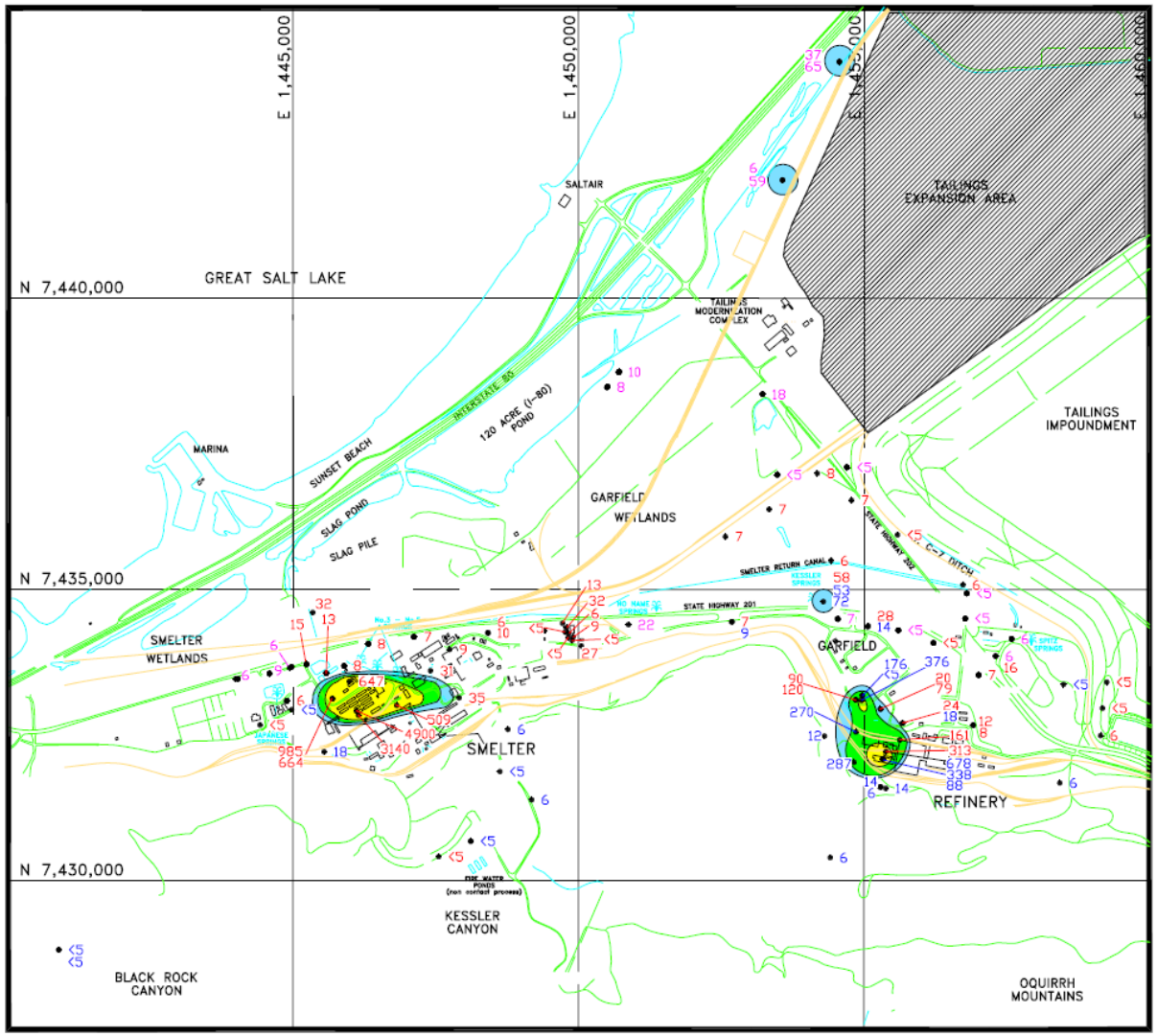
(in feet)

1 inch = 2000 ft.

Notes:

1. WELL LOCATIONS BASED ON JULY 2000 GPS SURVEY
* PRODUCTION WELL NO LONGER PUMPING. LAST SAMPLE COLLECTED JANUARY 2002.

ENVIRONMENTAL ENGINEERING SERVICES		KENNECOTT UTAH COPPER
SCALE: 1"=2000'	DATE	2ND QUARTER 2005 SELENIUM CONCENTRATION IN THE BEDROCK/PRINCIPAL AQUIFERS
DRAWN BY LBE	8/16/05	
CHECKED BY LBE	8/16/05	
PROJECT ENGINEER		
PROJECT MANAGER		Job No. --- Dwg. No. REV 2



EXPLANATION

• <2 WELL LOCATION AND ARSENIC CONCENTRTION (ug/l)

ARSENIC CONCENTRATION >250 ug/l

ARSENIC CONCENTRATION 100–250 ug/l

ARSENIC CONCENTRATION 50–100 ug/l

N

GRAPHIC SCALE

0 1000 2000 4000

(in feet)

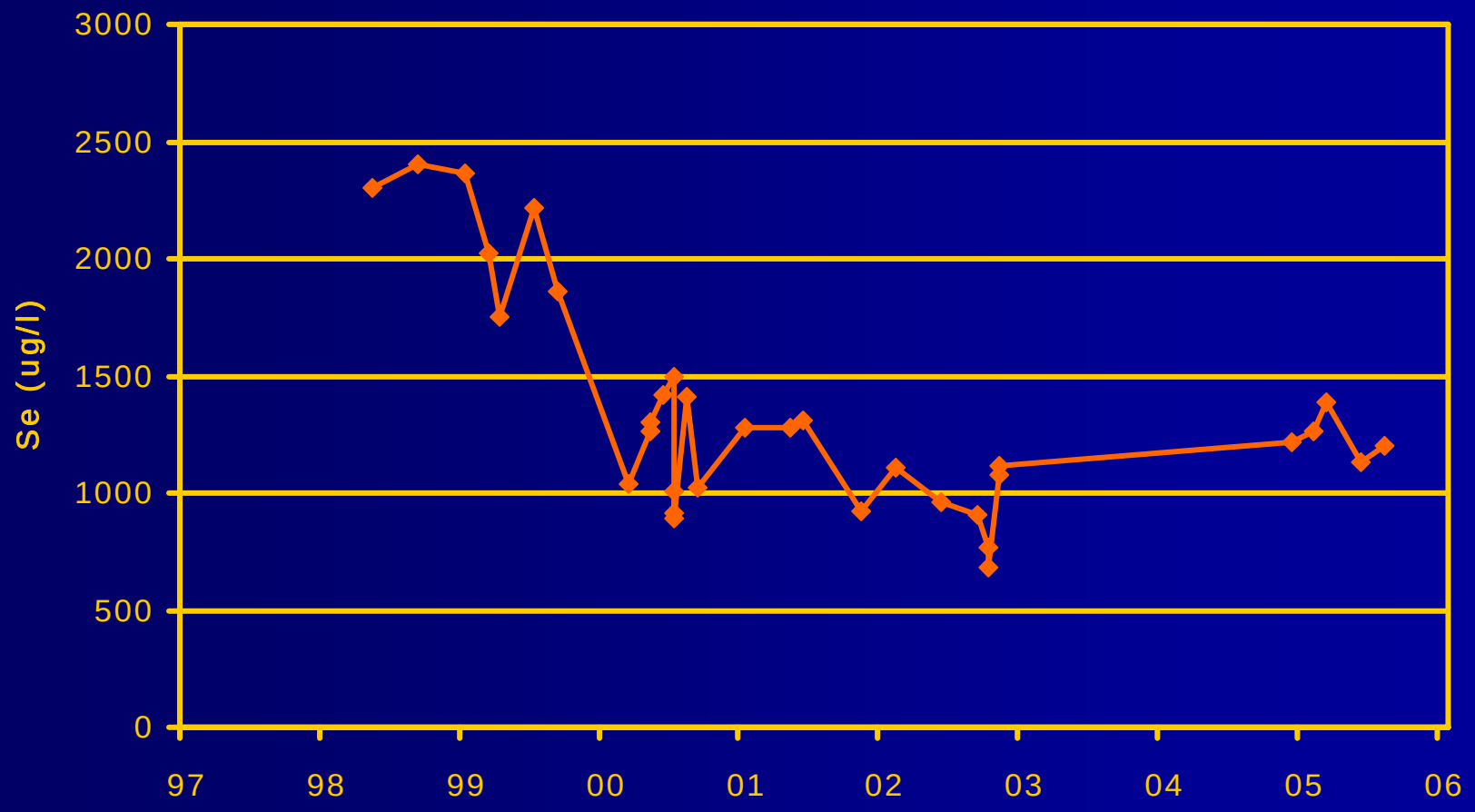
1 inch = 2000 ft.

Notes:

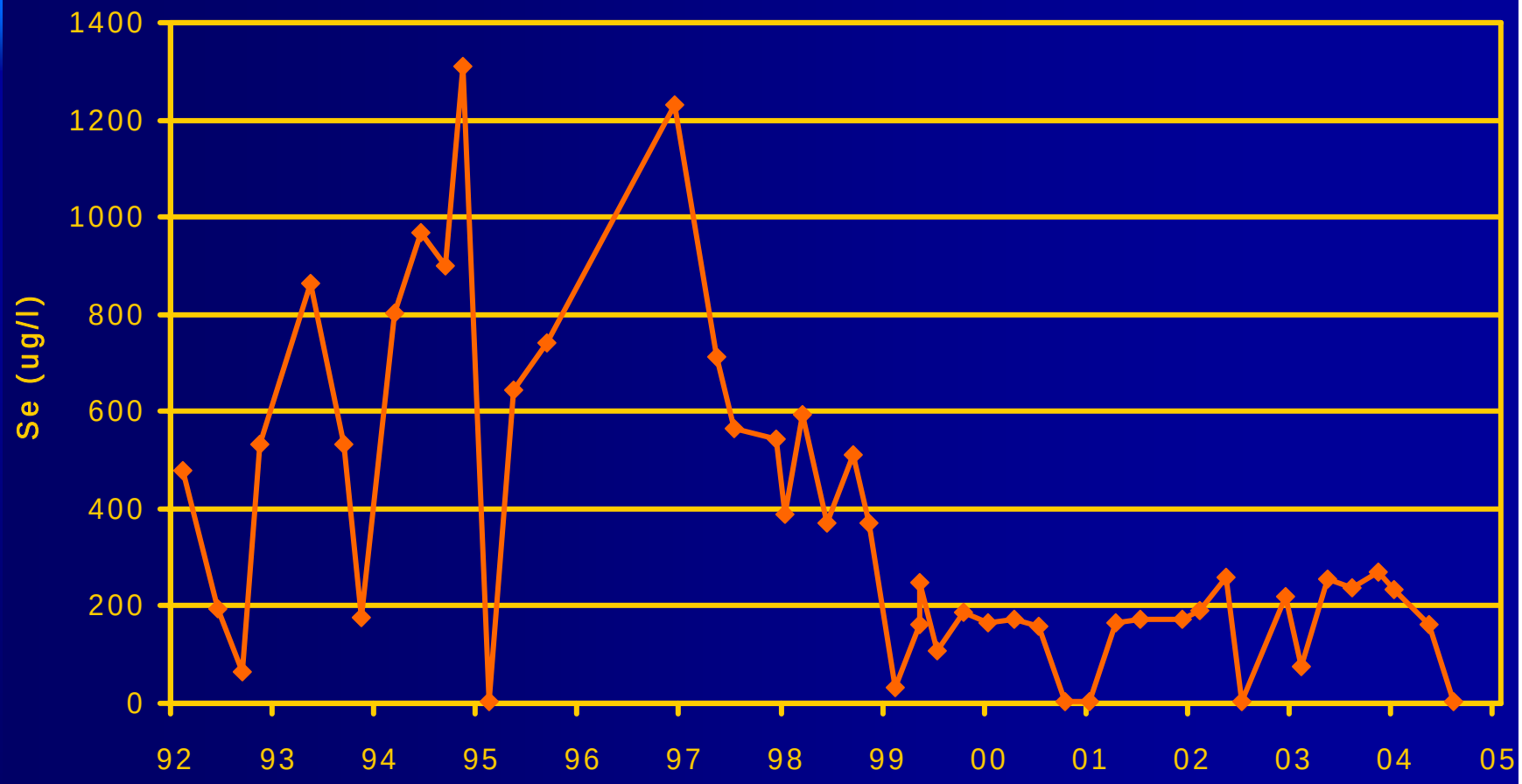
1. WELL LOCATIONS BASED ON JULY 2000 GPS SURVEY

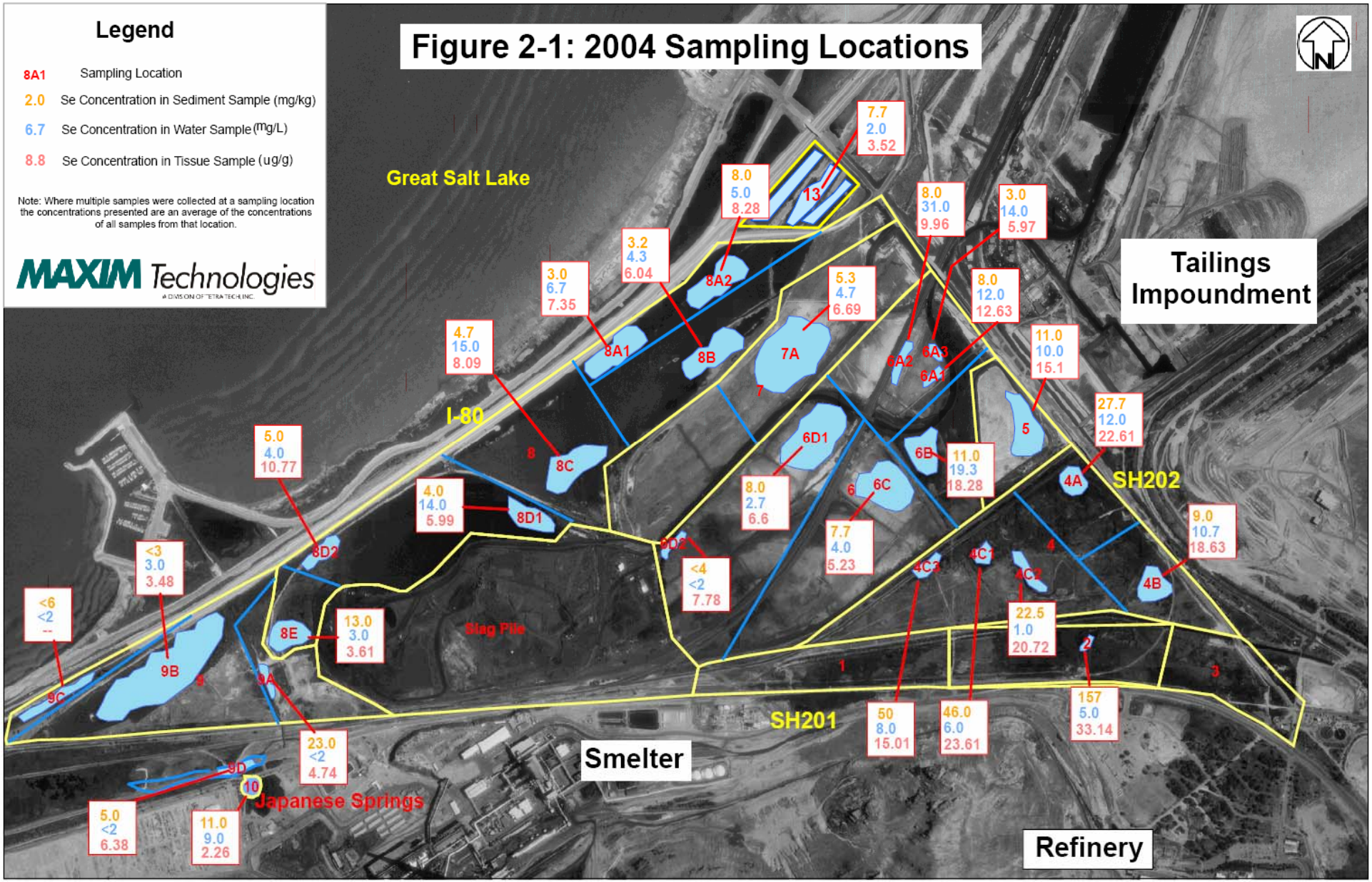
ENVIRONMENTAL ENGINEERING SERVICES		KENNECOTT UTAH COPPER
SCALE: 1"=2000'	DATE	2ND QUARTER 2005 ARSENIC CONCENTRATION IN THE PRINCIPAL AQUIFER
DESIGNED BY L. ELKIN	8/26/05	
DRAWN BY L. ELKIN	8/26/05	
CHECKED BY		
PROJECT ENGINEER		
PROJECT MANAGER		Job No. --- Dwg. No. AS2ND2005PR

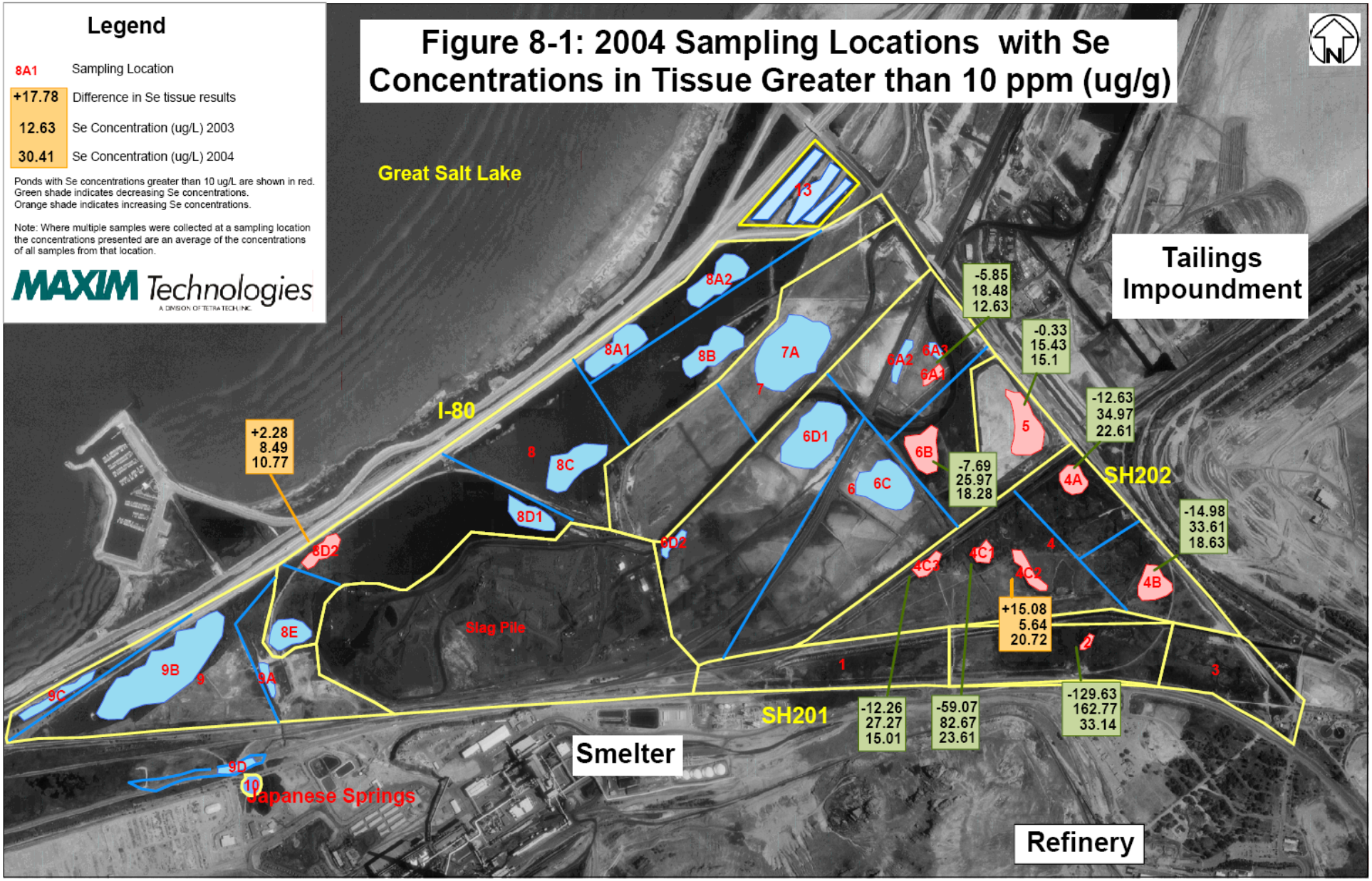
KESSLER SPRINGS



TOE OF SELENIUM PLUME (WELL NEG485)




Legend
8A1 Sampling Location
2.0 Se Concentration in Sediment Sample (mg/kg)
6.7 Se Concentration in Water Sample (mg/L)
8.8 Se Concentration in Tissue Sample (ug/g)
Note: Where multiple samples were collected at a sampling location the concentrations presented are an average of the concentrations of all samples from that location.
MAXIM Technologies
A DIVISION OF TETRA TECH, INC.
Figure 2-1: 2004 Sampling Locations
Great Salt Lake
Tailings Impoundment
I-80
SH202
SH201
Slag Pile
Smelter
Refinery
Japanese Springs
7.7 2.0 3.52
13
8.0 5.0 8.28
8.0 31.0 9.96
3.0 14.0 5.97
3.2 4.3 6.04
3.0 6.7 7.35
8A2
5.3 4.7 6.69
8.0 12.0 12.63
4.7 15.0 8.09
8A1
8B
7A
6A2
6A3
6A1
11.0 10.0 15.1
7
27.7 12.0 22.61
5.0 4.0 10.77
8
8C
6D1
6B
11.0 19.3 18.28
5
4A
SH202
4.0 14.0 5.99
8D1
8.0 2.7 6.6
6
6C
9.0 10.7 18.63
<3 3.0 3.48
8D2
8D2'
7.7 4.0 5.23
4
4C3
4C1
4C2
4B
<4 <2 7.78
<6 <2 --
13.0 3.0 3.61
8E
Slag Pile
22.5 1.0 20.72
2
9B
9
9A
1
3
9C
157 5.0 33.14
50 8.0 15.01
46.0 6.0 23.61
23.0 <2 4.74
9D
10
5.0 <2 6.38
11.0 9.0 2.26


Legend
8A1 Sampling Location
+17.78 Difference in Se tissue results
12.63 Se Concentration (ug/L) 2003
30.41 Se Concentration (ug/L) 2004
Ponds with Se concentrations greater than 10 ug/L are shown in red.
Green shade indicates decreasing Se concentrations.
Orange shade indicates increasing Se concentrations.
Note: Where multiple samples were collected at a sampling location the concentrations presented are an average of the concentrations of all samples from that location.
MAXIM Technologies
A DIVISION OF TETRA TECH, INC.
Figure 8-1: 2004 Sampling Locations with Se Concentrations in Tissue Greater than 10 ppm (ug/g)
Great Salt Lake
Tailings Impoundment
I-80
SH202
SH201
Smelter
Refinery
Slag Pile
Japanese Springs
13
8A2
8A1
8B
7A
7
6A2
6A3
6A1
6D1
6B
6C
6
5
4A
4
4C1
4C2
4C3
4B
8
8C
8D1
8D2
6D2
8E
9B
9
9A
9C
9D
10
1
2
3
+2.28
8.49
10.77
-5.85
18.48
12.63
-0.33
15.43
15.1
-12.63
34.97
22.61
-7.69
25.97
18.28
-14.98
33.61
18.63
+15.08
5.64
20.72
-12.26
27.27
15.01
-59.07
82.67
23.61
-129.63
162.77
33.14

2005-2006 Demolition

- Precipitation Plant (Bingham Creek)
- Bonneville Crusher
- Lark Coal Silo

2005 10 11

2005 10 11

CAT

24 9:44AM

2005 10 10

2005 10 11

2005 9 19