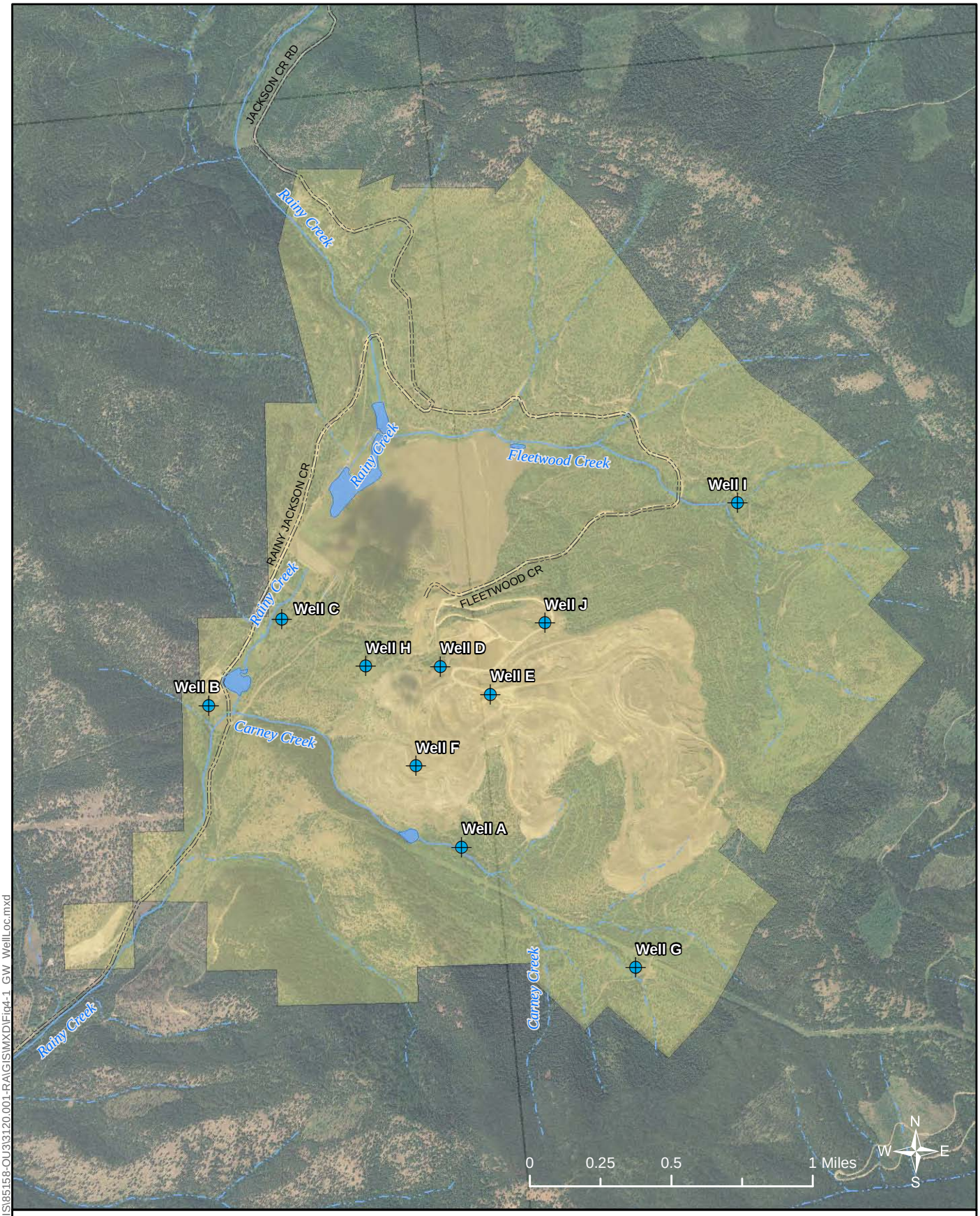
LIBBY ASBESTOS SUPERFUND SITE, OPERABLE UNIT 3
DATA SUMMARY REPORT: 2007 TO 2011

FIGURES – Sections 4 to 6

Revision 0 – November 2013



Sediment Locations
County Road
Primary Road
Perennial Stream
Intermittent Stream
Open Water
Former Mine Property

Figure 4-1
Well Locations

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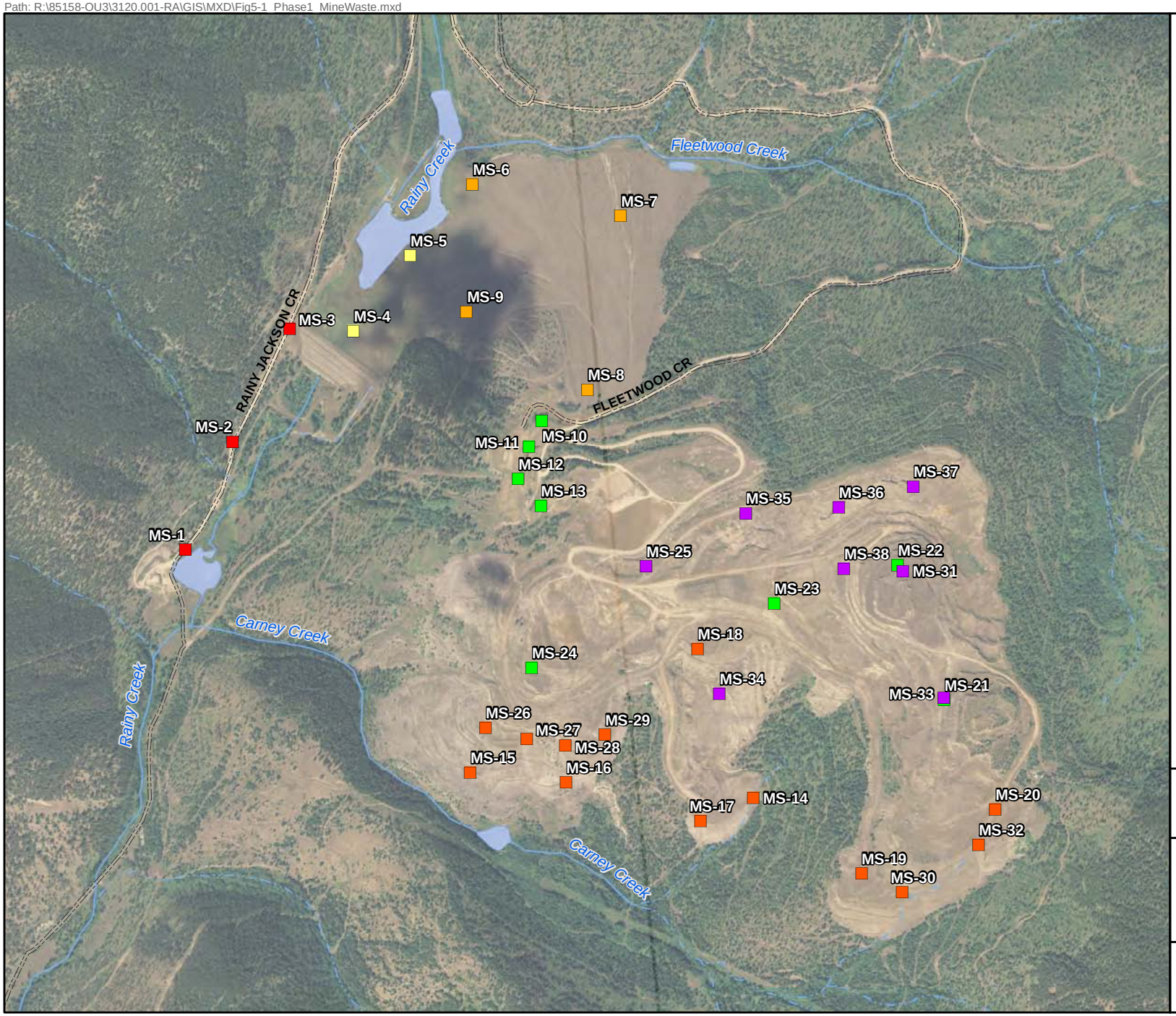


Legend

- County Road
- Primary Road
- Perennial Stream
- Intermittent Stream
- Open Water

Mine Waste Sampling Location

- Waste Rock
- Cover Material
- Outcrop
- Coarse Tailings
- Tailings Impoundment
- Road

N
W E
S

0 750 1,500
Feet

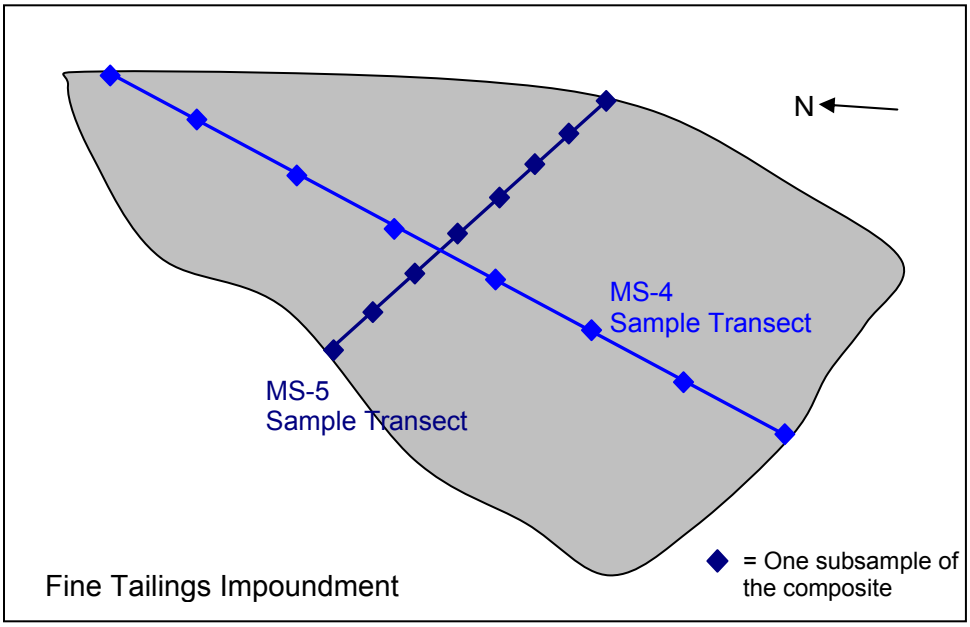
LIBBY, MONTANA SUPERFUND SITE
Operable Unit 3

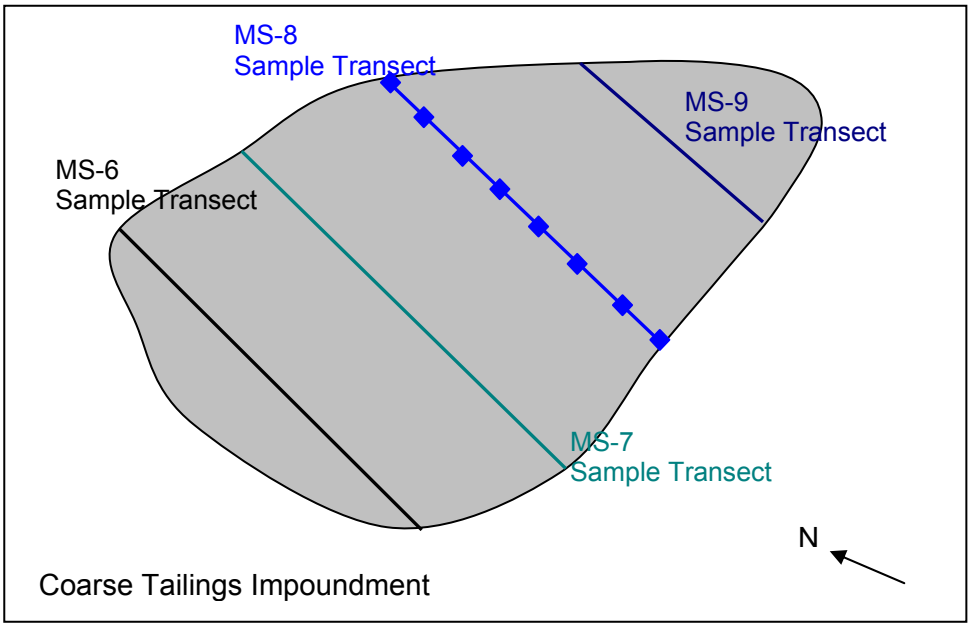
Figure 5-1

Mine Waste Sampling Locations

CDM Smith

Figure 5-2. Schematic Illustration of Sampling Procedure for Transect Samples





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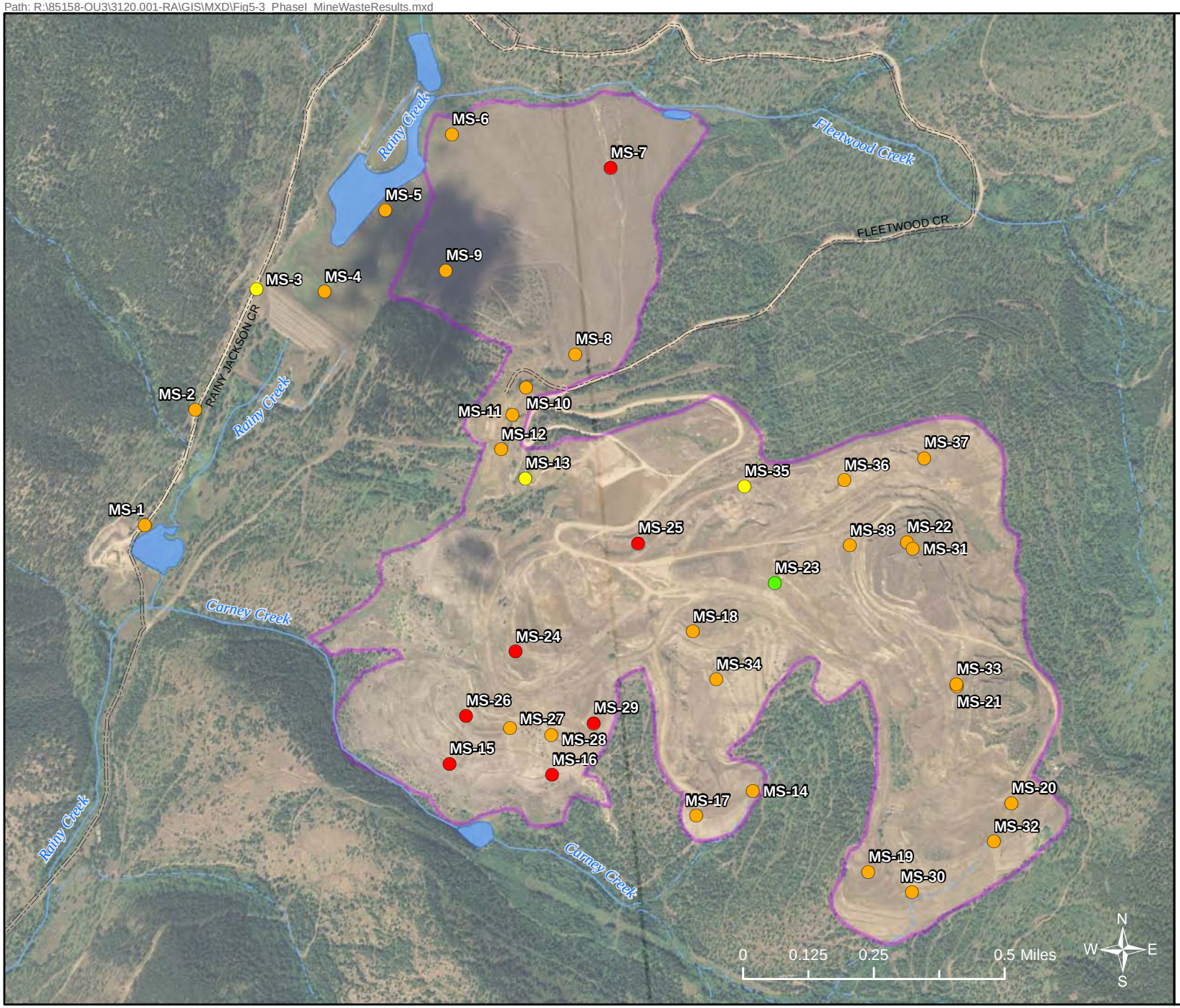
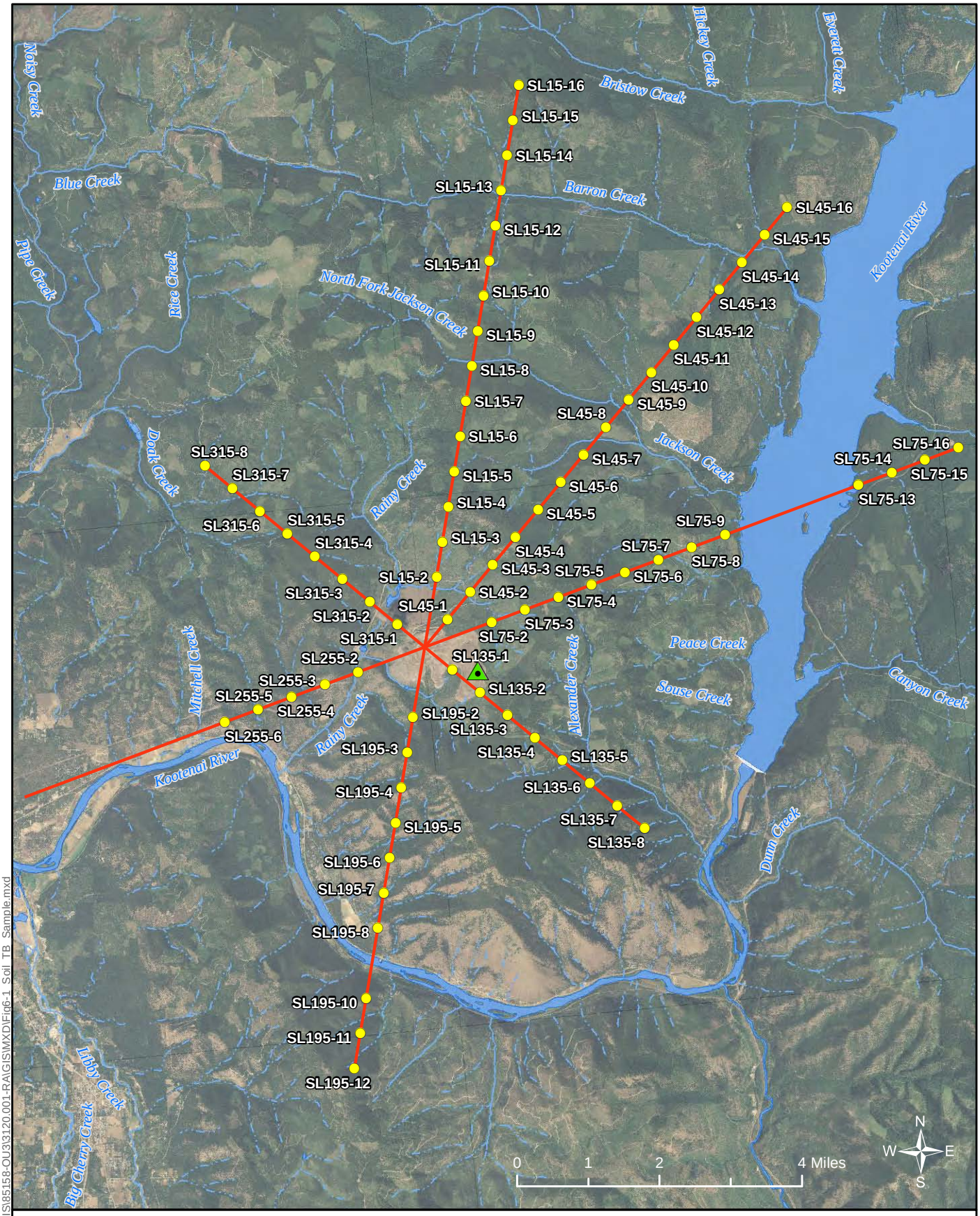


Asbestos in Mine Waste (MFLA % fine - Percent Mass Fraction)

- A (ND)
- B1 (TR)
- B2 (< 1%)
- C (>= 1%)
- County Road
- Primary Road
- Perennial Stream
- Intermittent Stream
- Open Water
- Mined Area

Figure 5-3
Asbestos Levels In Mine Waste, Phase I

CDM Smith



CDM Smith

Soil/Tree Bark Sampling Location

Meterological Station

ExampleSurfSoilLine

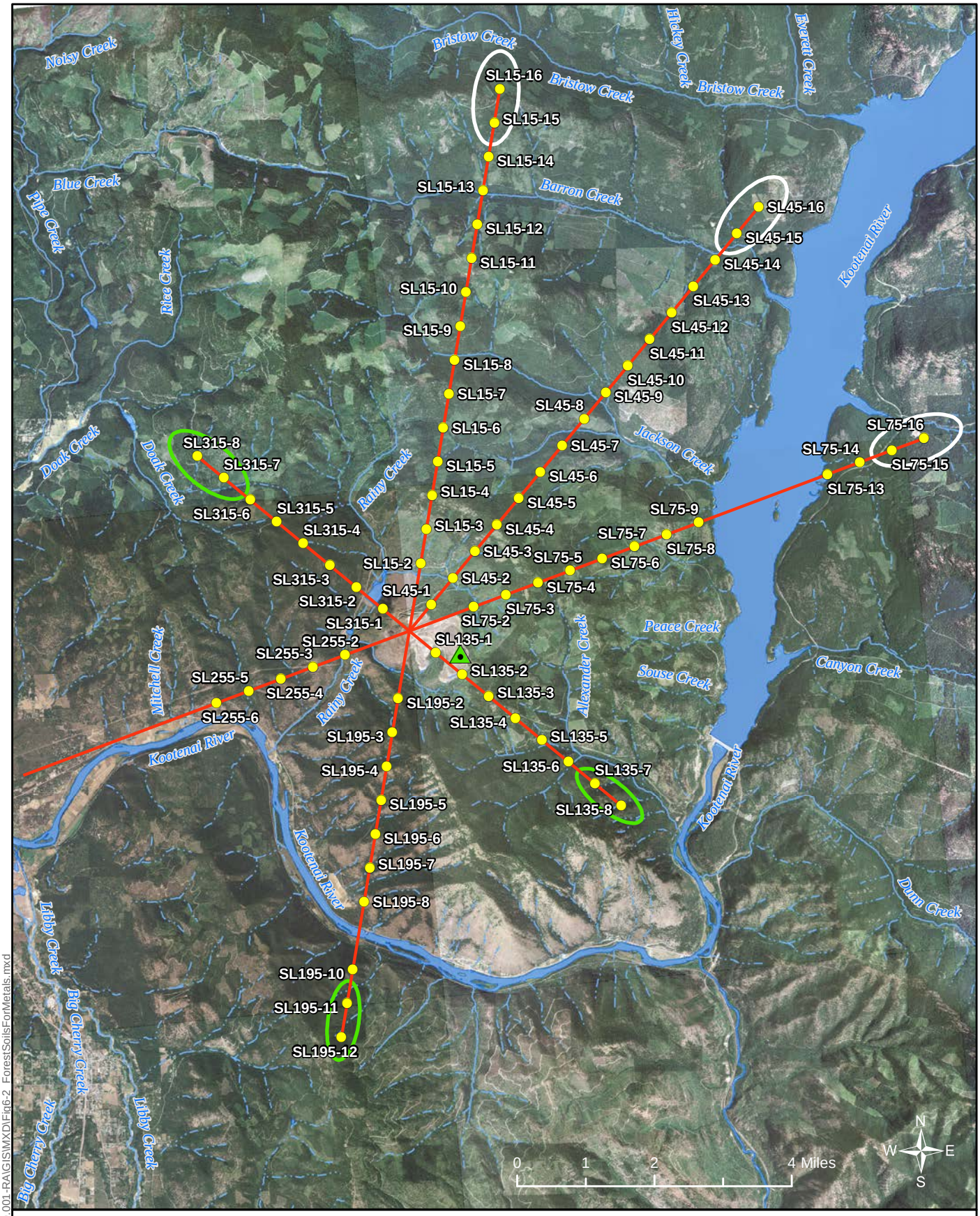
Perennial Stream

Intermittent Stream

Open Water

Figure 6-1
Soil / Tree Bark Sampling Locations

Path: \\denqissvr1\LibbyGIS\85158-OU3\3120.001-RA\GIS\MXD\Fig6-1_Soil_TB_Sample.mxd



CDM Smith

Soil/Tree Bark Sampling Location

Meterological Station

ExampleSurfSoilLine

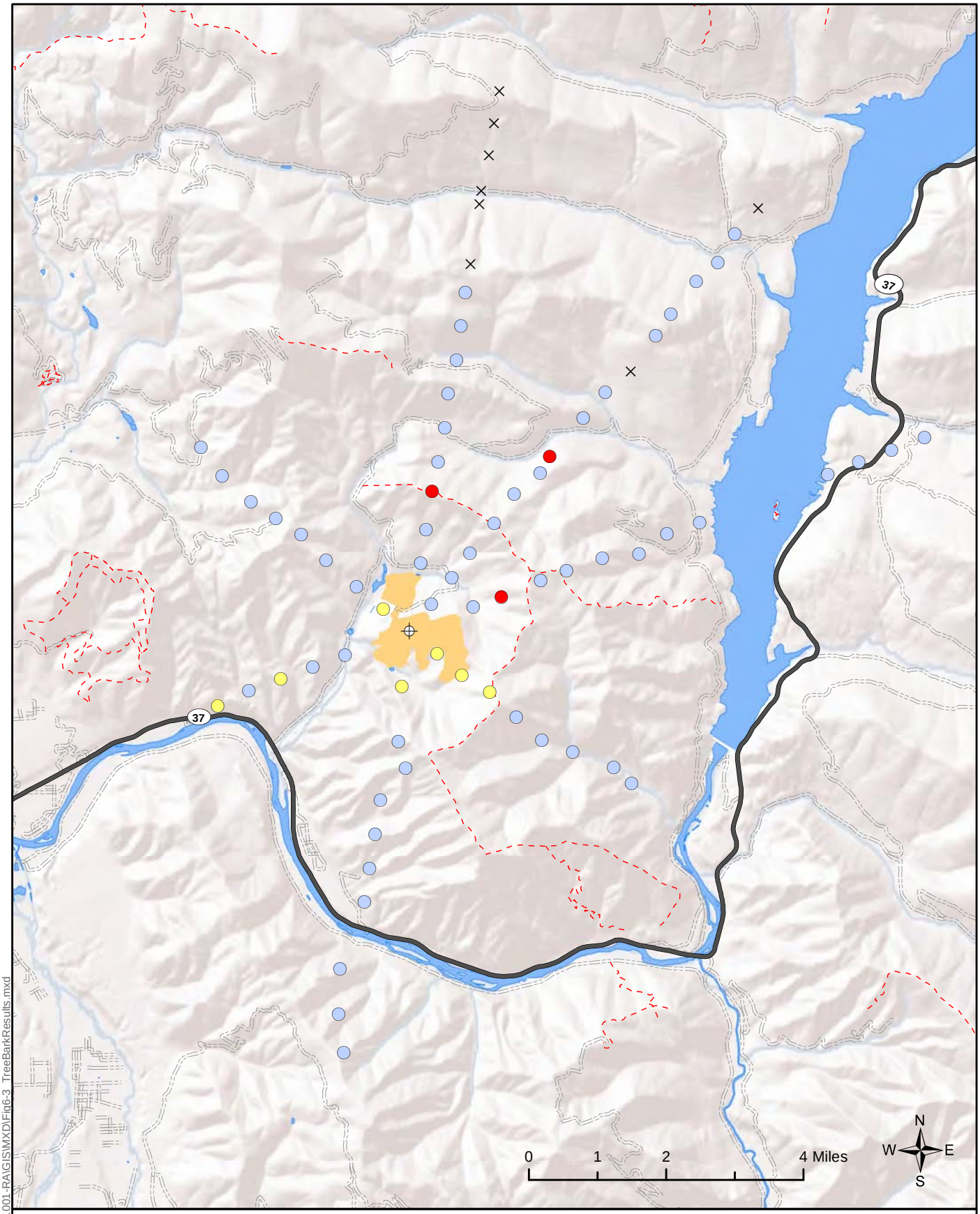
Perennial Stream

Intermittent Stream

Open Water

Figure 6-2
Forest Soil Locations Selected for Metal Analysis

Path: R:\85158-OU3\3120.001-RA\GIS\MXD\Fig6-2_ForestSoilsForMetals.mxd



CDM Smith

Asbestos in Tree Bark (LA Loading - Million Structure/square cm)

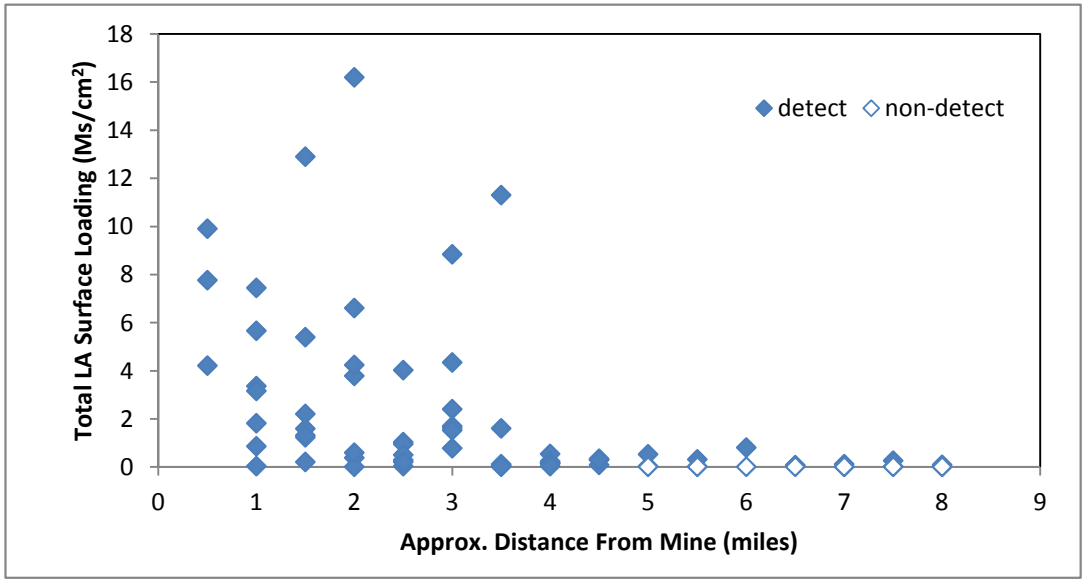
- 0.00
- 0.01 - 5.00
- 5.01 - 10.00
- 10.01 - 16.19

- National Forest Service Trails
- County Road
- Primary Road
- Open Water

Figure 6-3
Asbestos Concentrations in Tree Bark, Phase I

Path: R:\85158-OU3\3120.001-RA\GIS\MXD\Fig6-3_TreeBarkResults.mxd

FIGURE 6-4. PHASE I TREE BARK SURFACE LOADING AS A FUNCTION OF DISTANCE FROM THE MINE

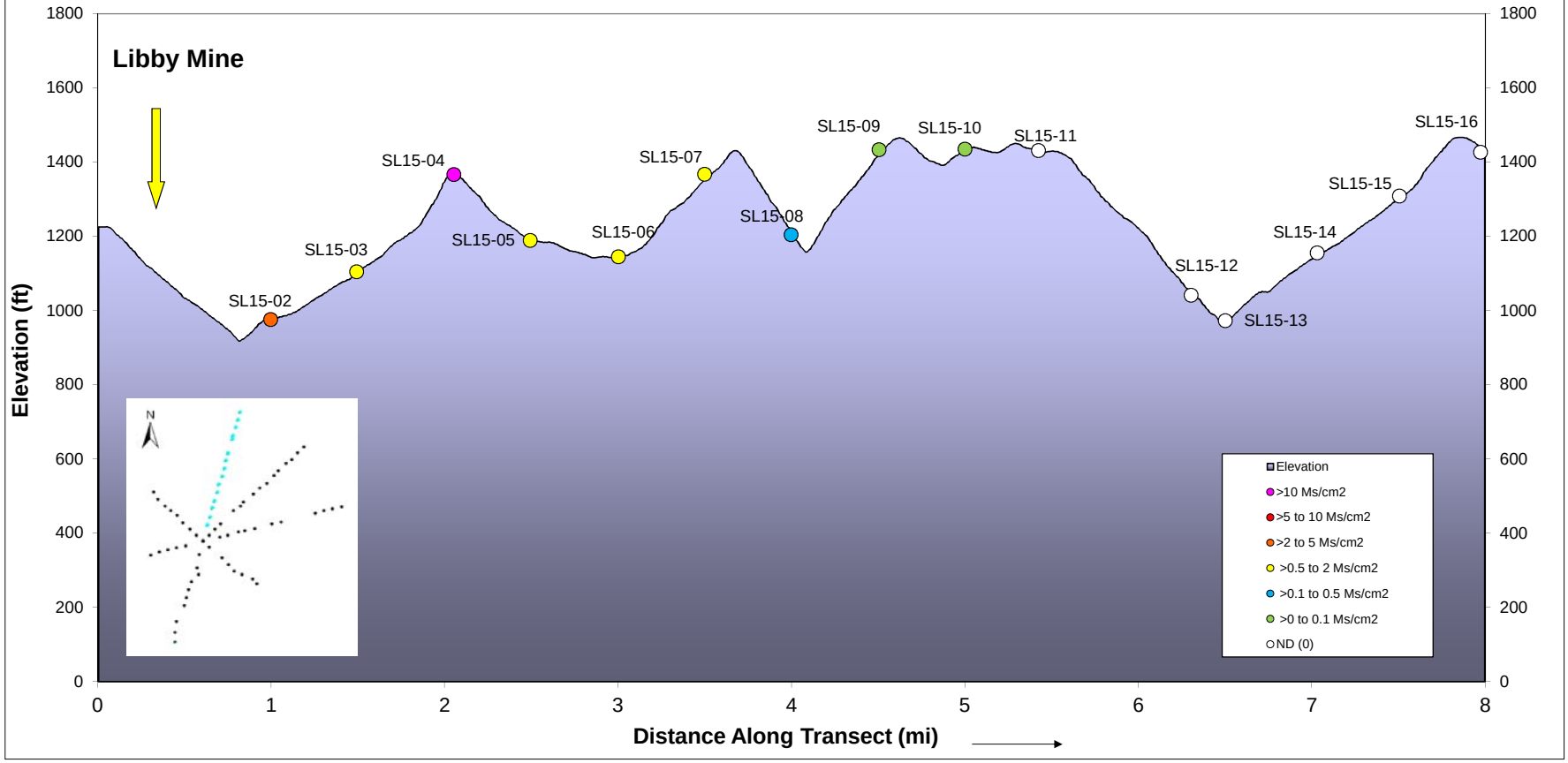


LA = Libby amphibole

Ms/cm^2 = million structures per square centimeter

Figure 6-5

Asbestos Levels in Tree Bark Along Transect 15º



Libby Asbestos Superfund Site - OU3

Figure 6-6

Asbestos Levels in Tree Bark Along Transect 45º

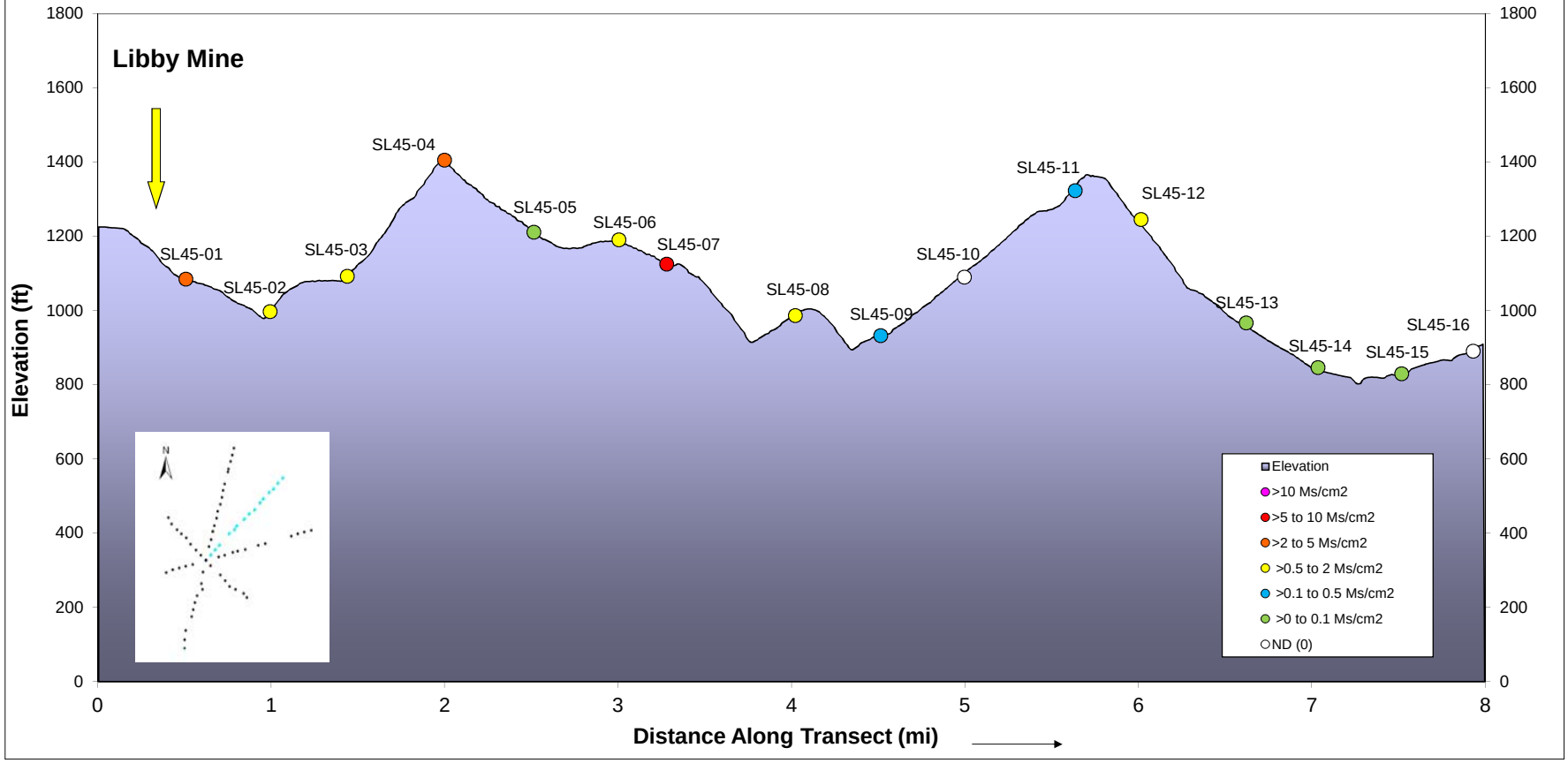


Figure 6-7

Asbestos Levels in Tree Bark Along Transect 75º

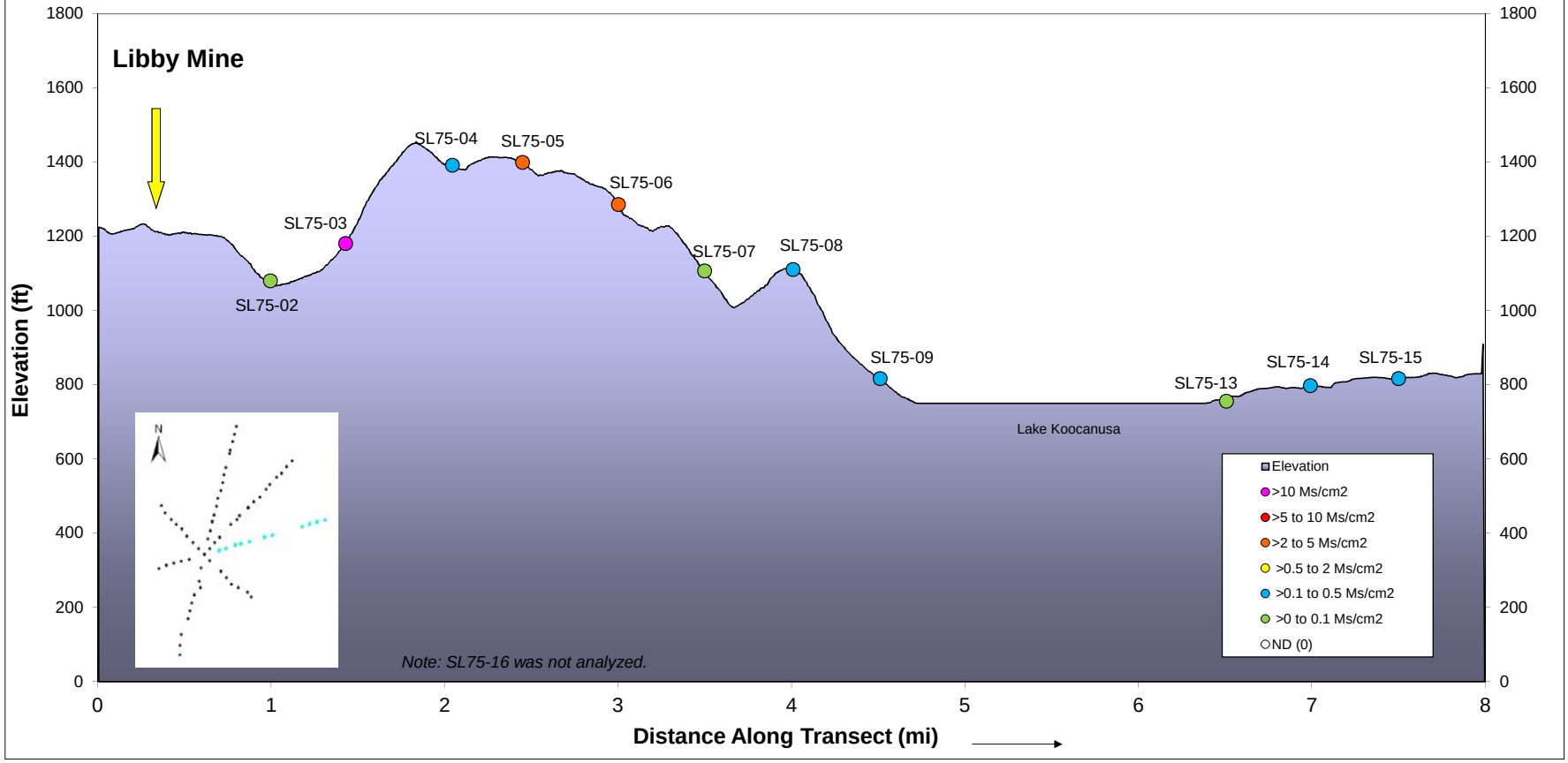


Figure 6-8

Asbestos Levels in Tree Bark Along Transect 195°

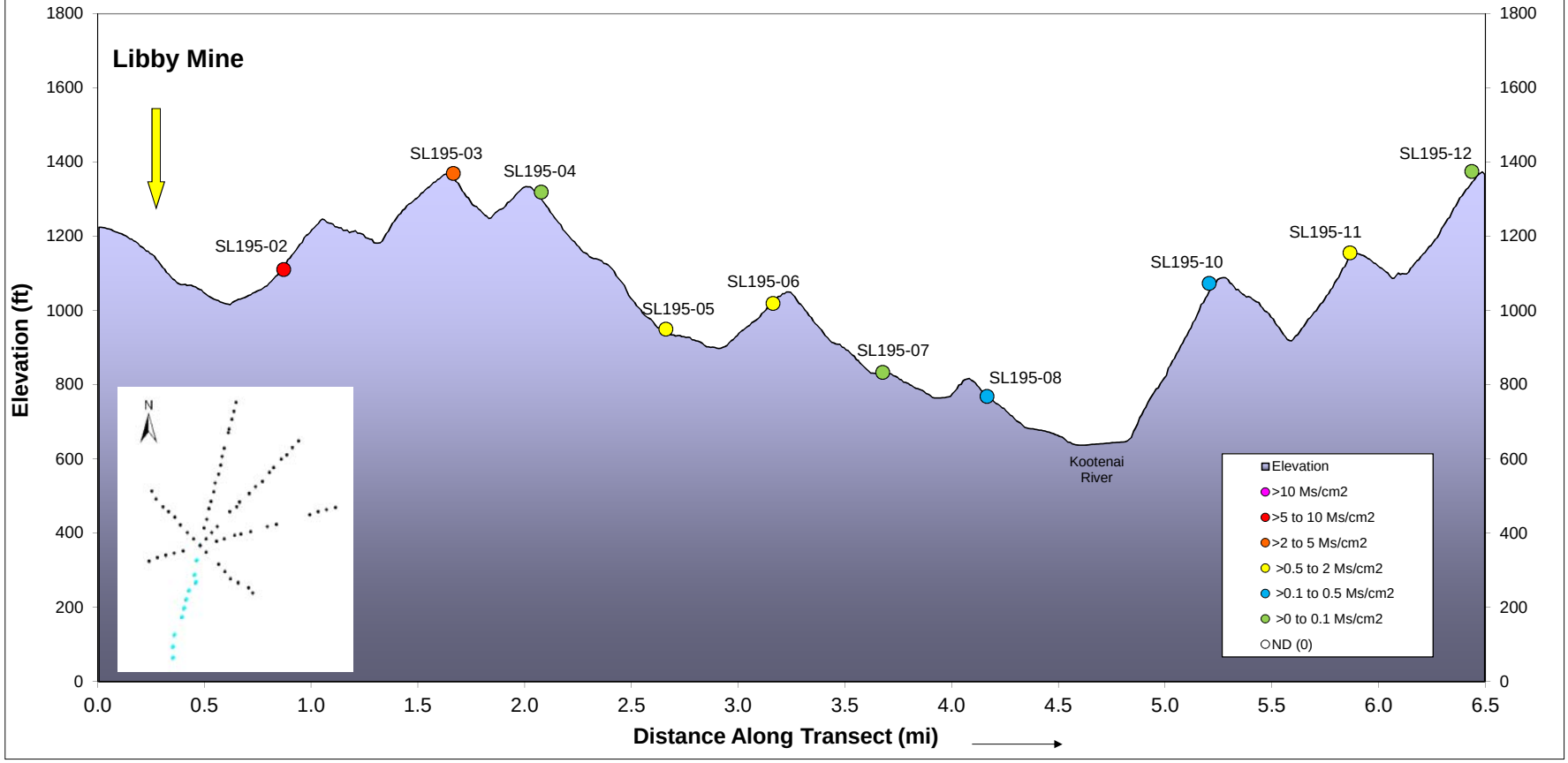


Figure 6-9

Asbestos Levels in Tree Bark Along Transect 255°

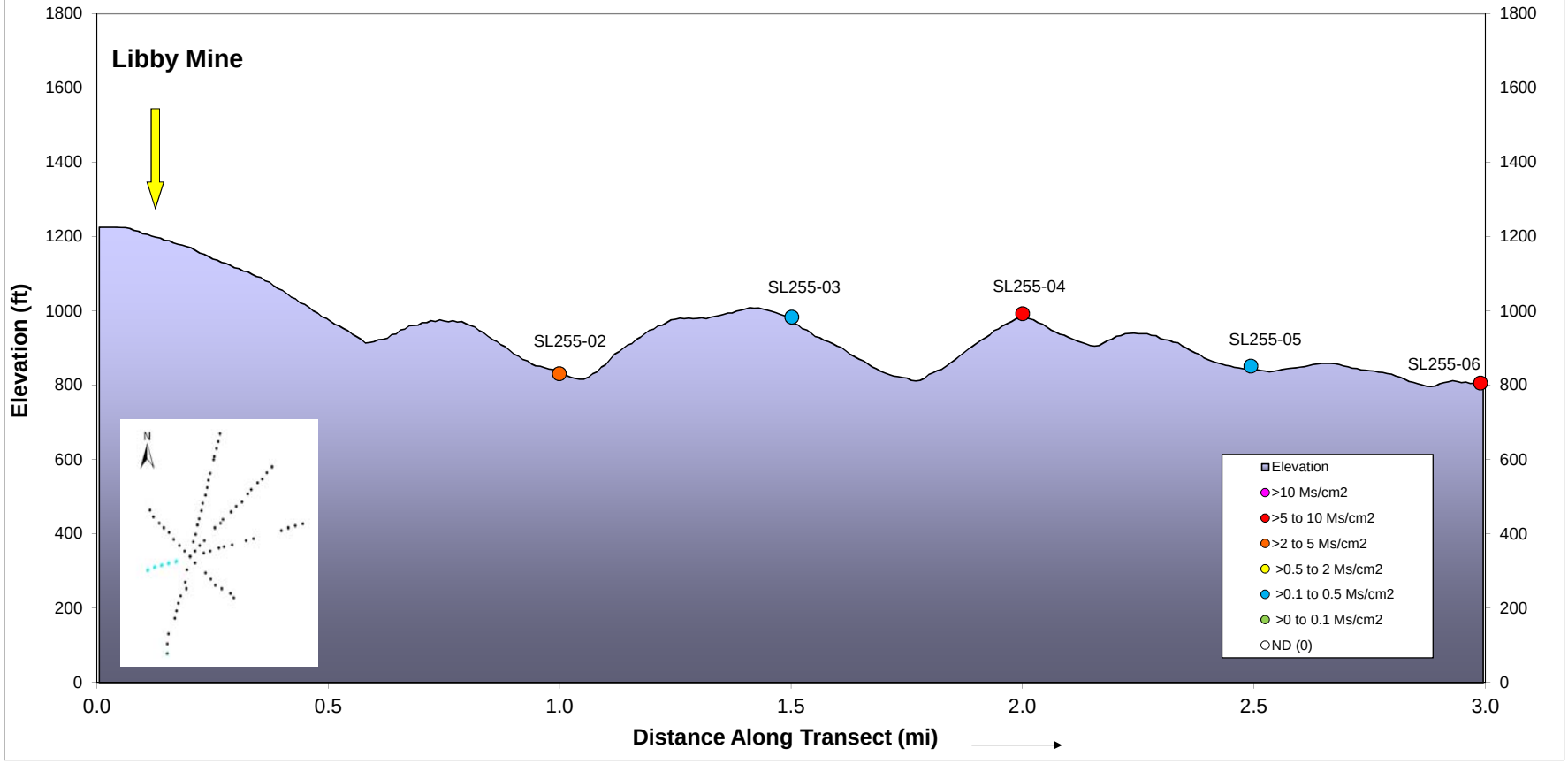


Figure 6-10

Asbestos Levels in Tree Bark Along Transect 135º

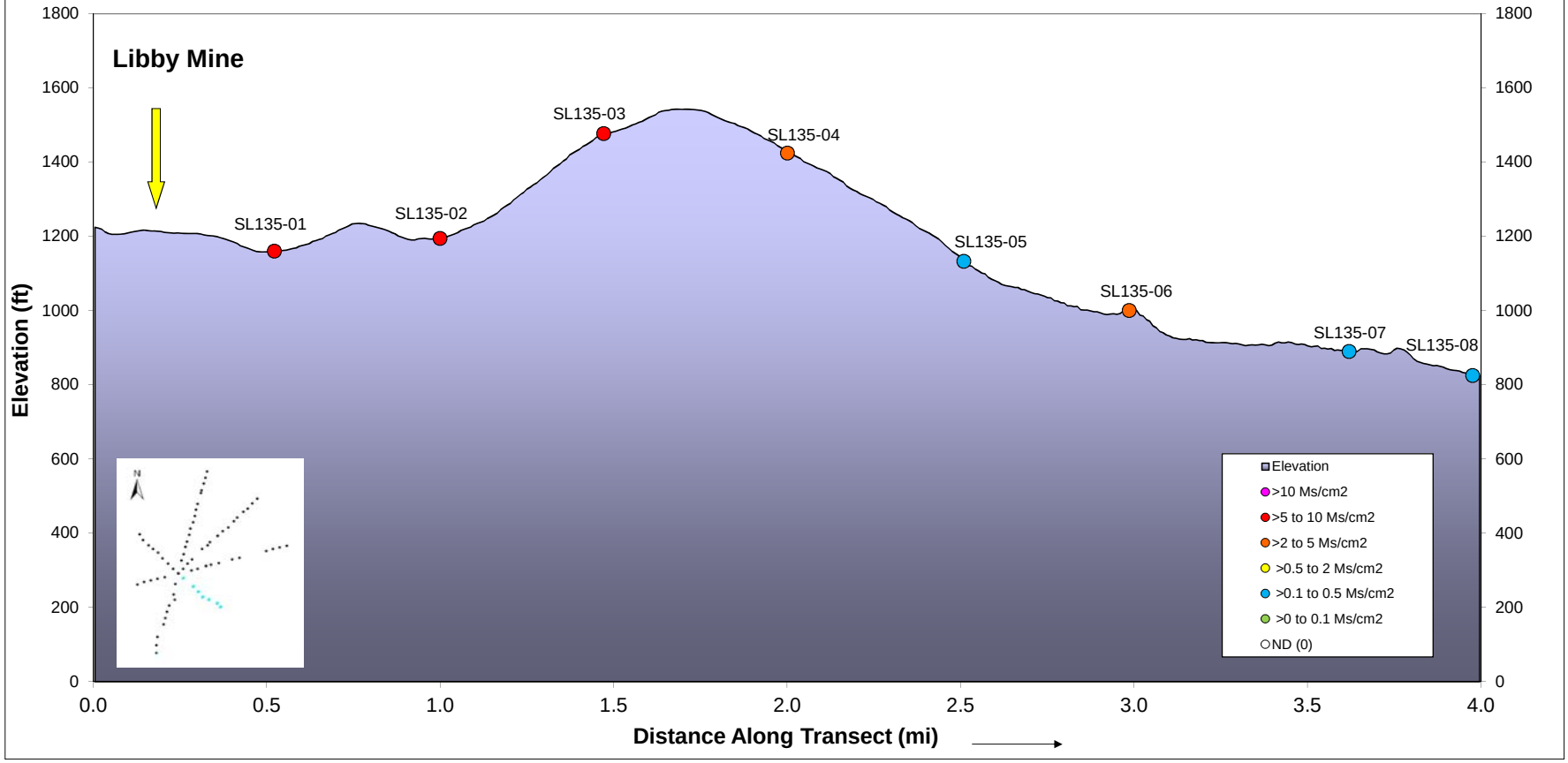
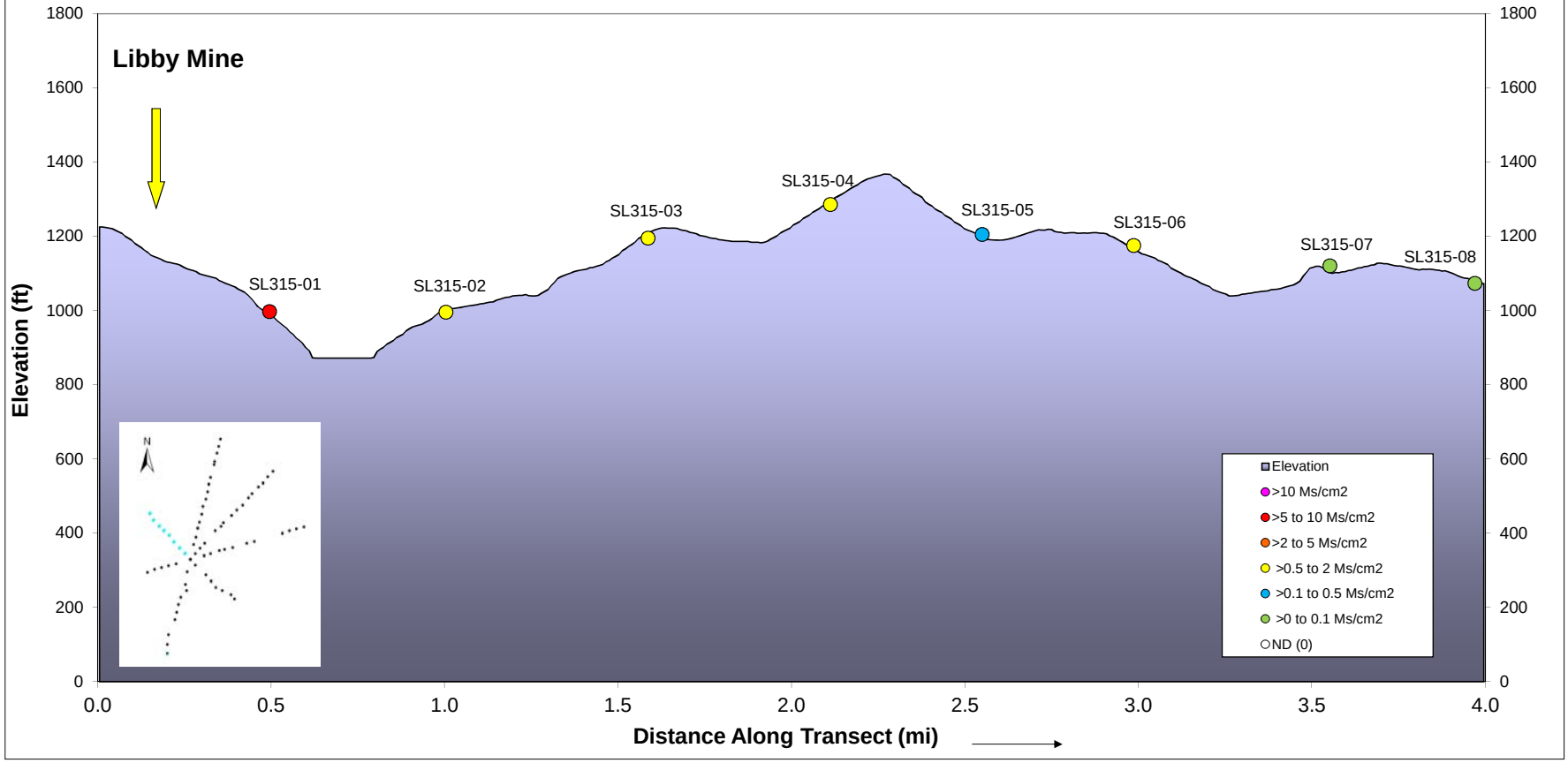
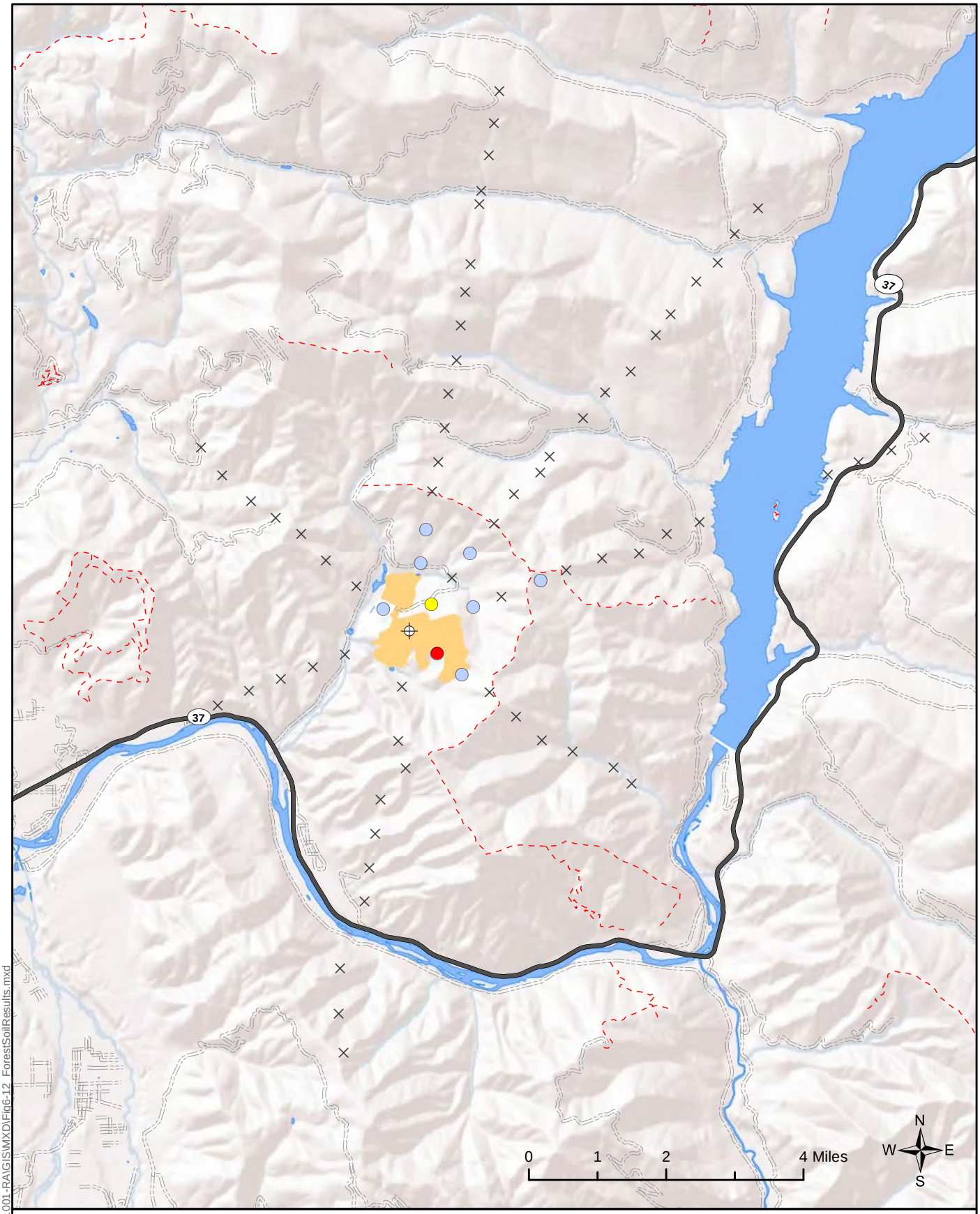


Figure 6-11

Asbestos Levels in Tree Bark Along Transect 315°





CDM Smith

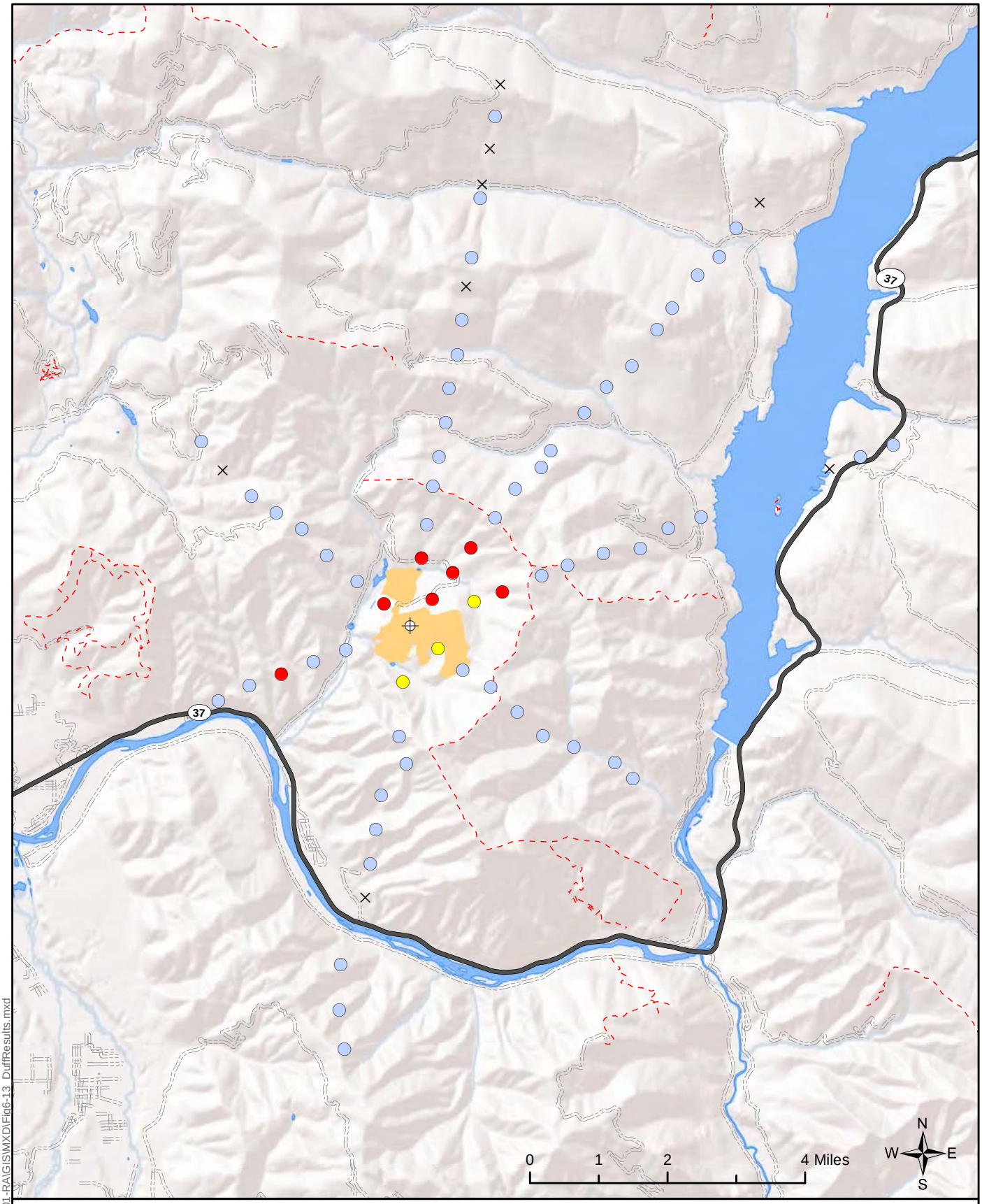
Asbestos in Forest Soil
(MFLA% fine - Percent Mass Fraction)

- A (ND)
- B1 (TR)
- B2 (< 1%)
- C (>= 1%)

- National Forest Service Trails
- County Road
- Primary Road
- Open Water

Figure 6-12
Asbestos Concentrations in Forest Soil, Phase I

Path: R:\85158-OU3\3120.001-RA\GIS\MXD\Fig6-12_ForestSoilResults.mxd



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Asbestos in Duff
(million structures per gram)

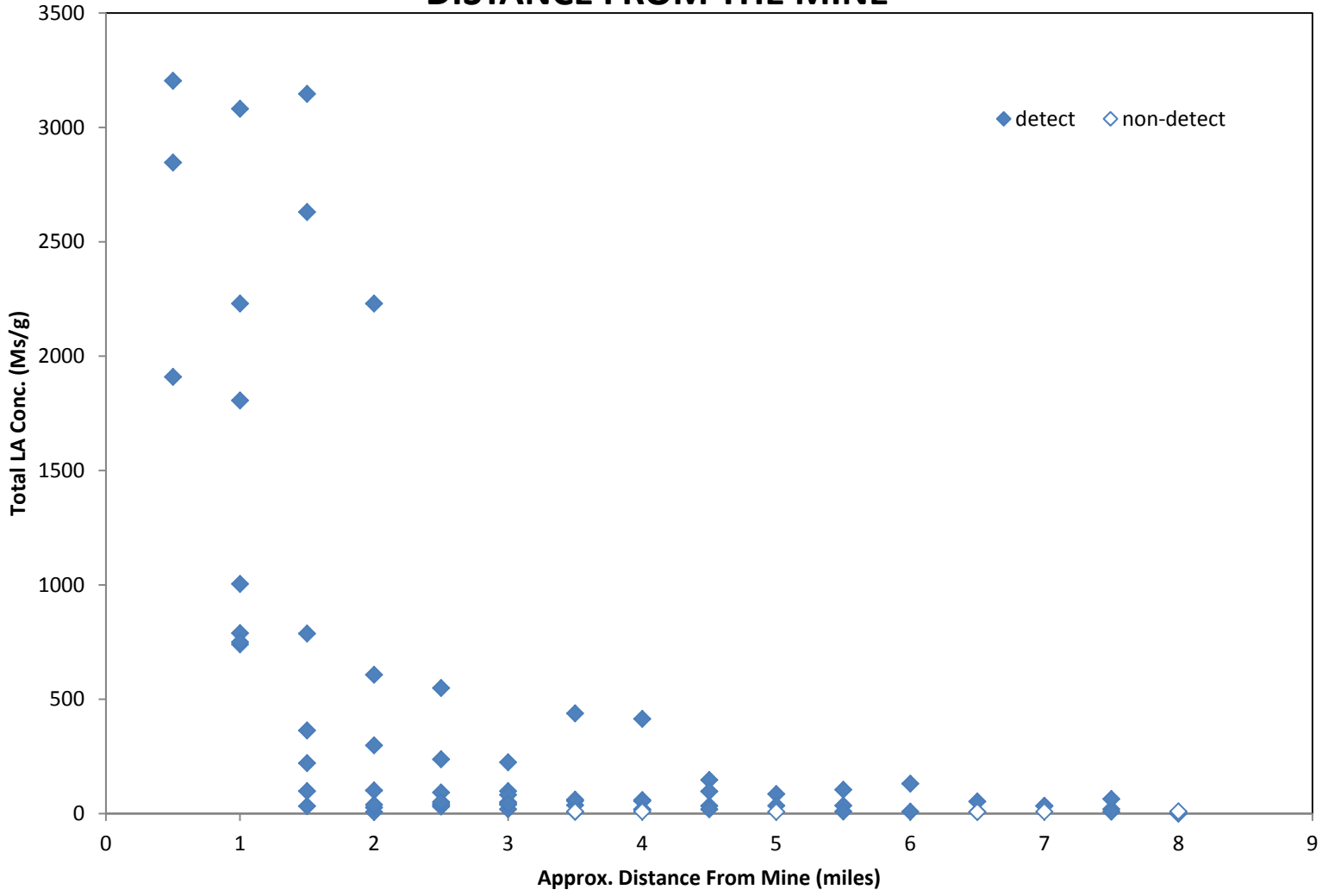
- × 0
- >0 - 1,000
- >1,000 - 2,000
- >2,000

- National Forest Service Trails
- County Road
- Primary Road
- Open Water

Figure 6-13
Asbestos Concentrations in Duff, Phase I

Path: R:\85158-OU3\3120.001-RA\GIS\MXD\Fig6-13_DuffResults.mxd

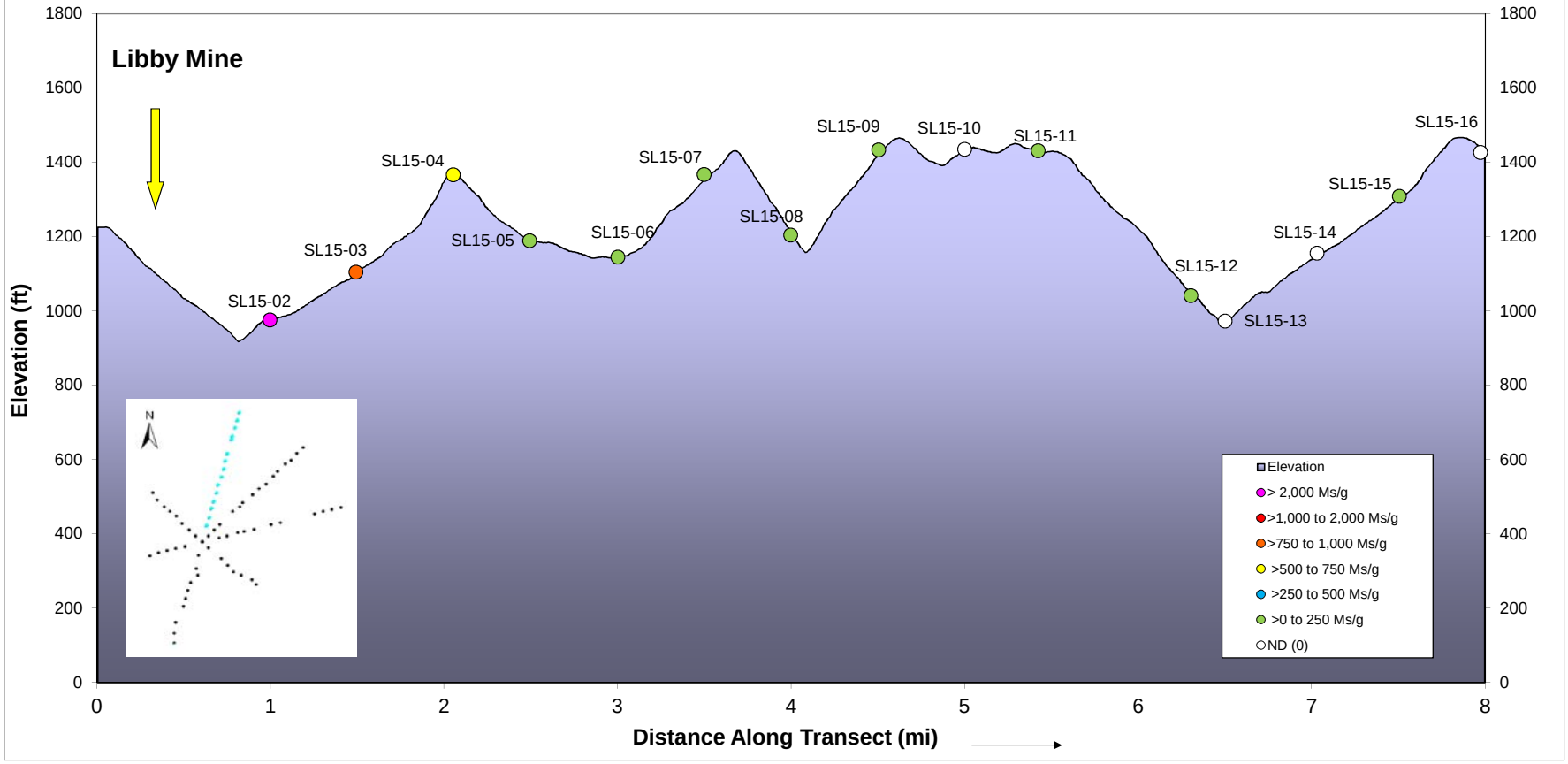
FIGURE 6-14. PHASE I DUFF CONCENTRATIONS AS A FUNCTION OF DISTANCE FROM THE MINE



LA = Libby amphibole
Ms/g = million structures per gram

Figure 6-15

Asbestos Levels in Duff Along Transect 15º



Libby Asbestos Superfund Site - OU3

Figure 6-16

Asbestos Levels in Duff Along Transect 45º

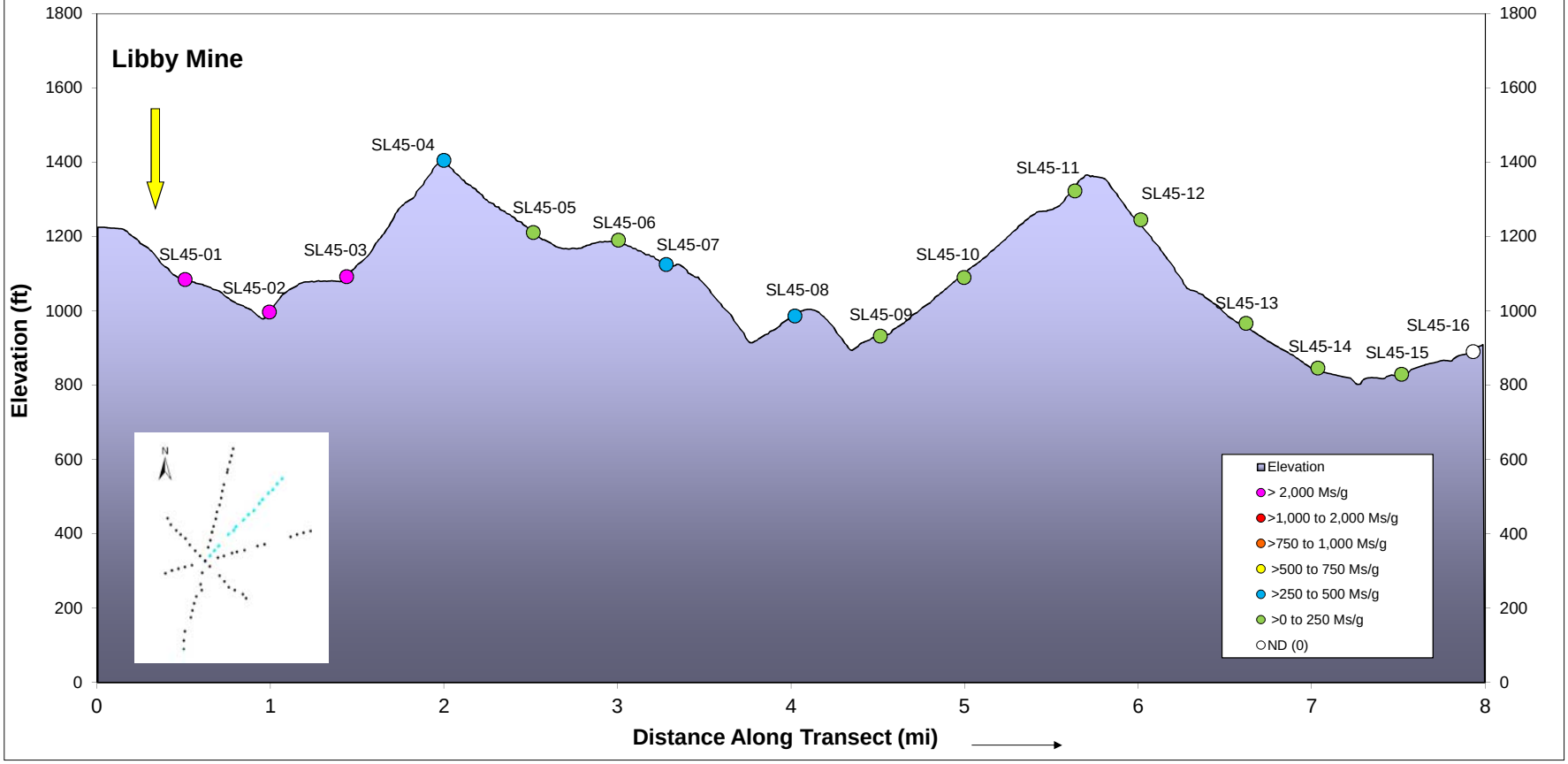


Figure 6-17

Asbestos Levels in Duff Along Transect 75º

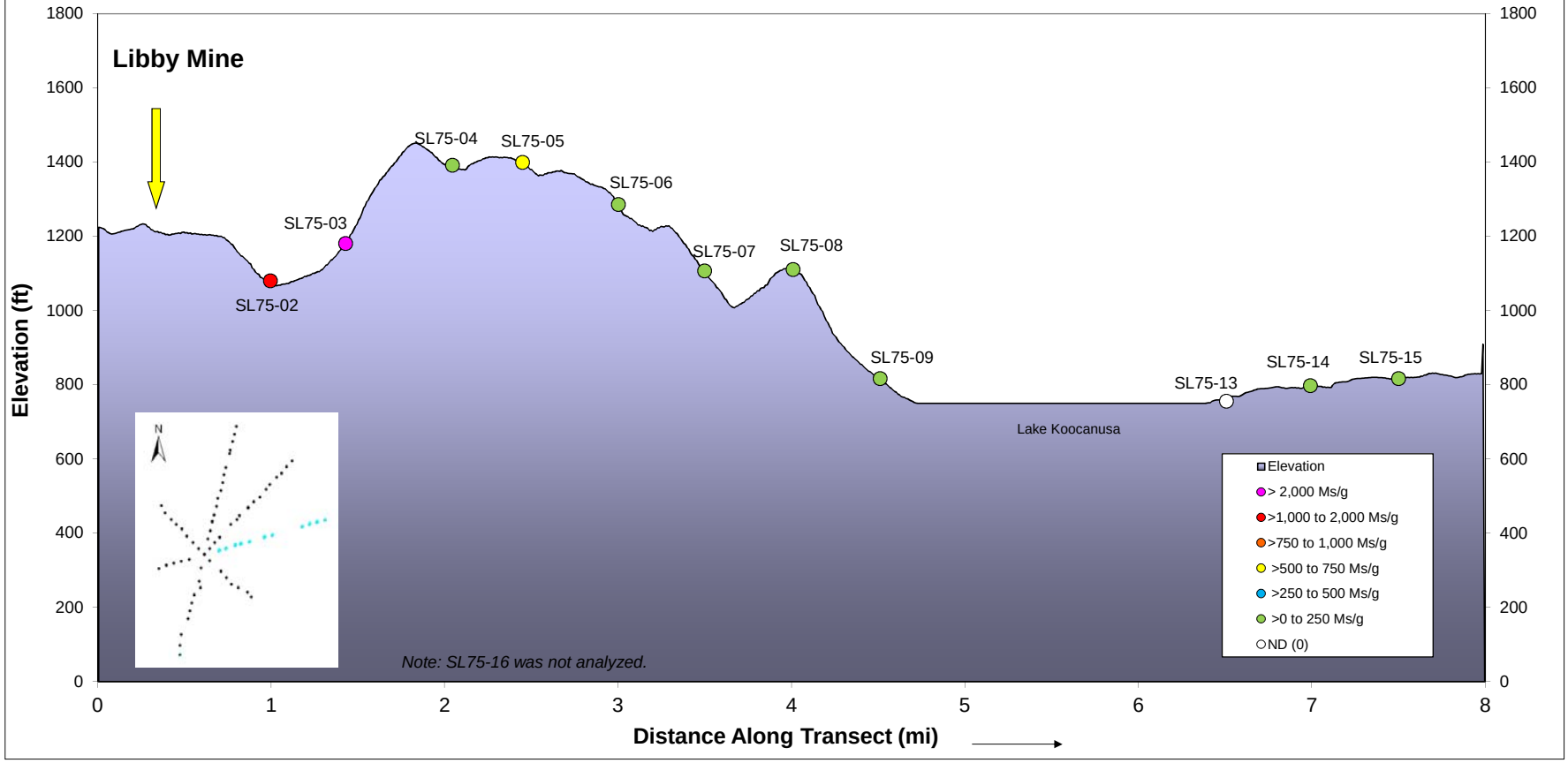


Figure 6-18

Asbestos Levels in Duff Along Transect 195º

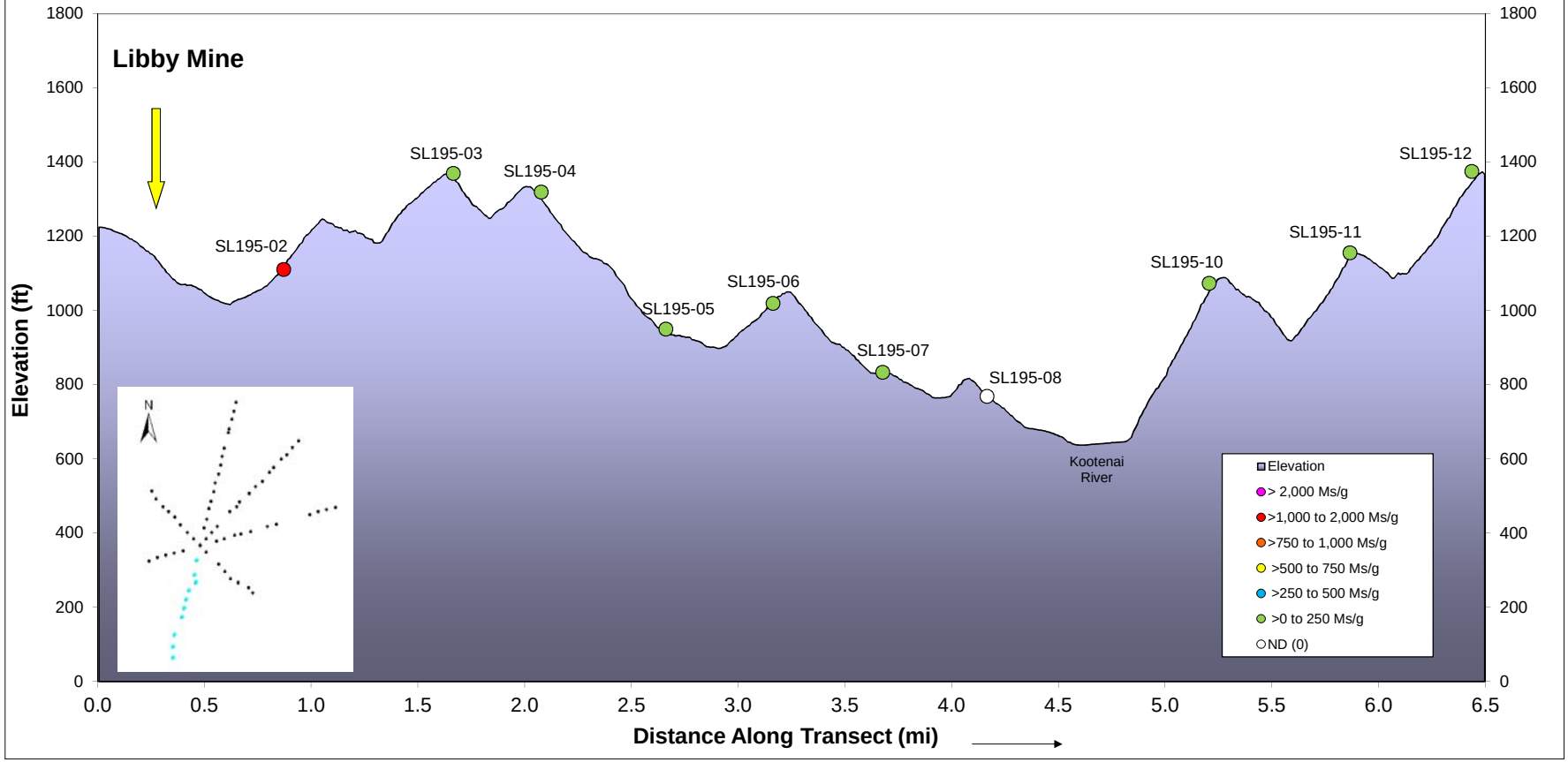
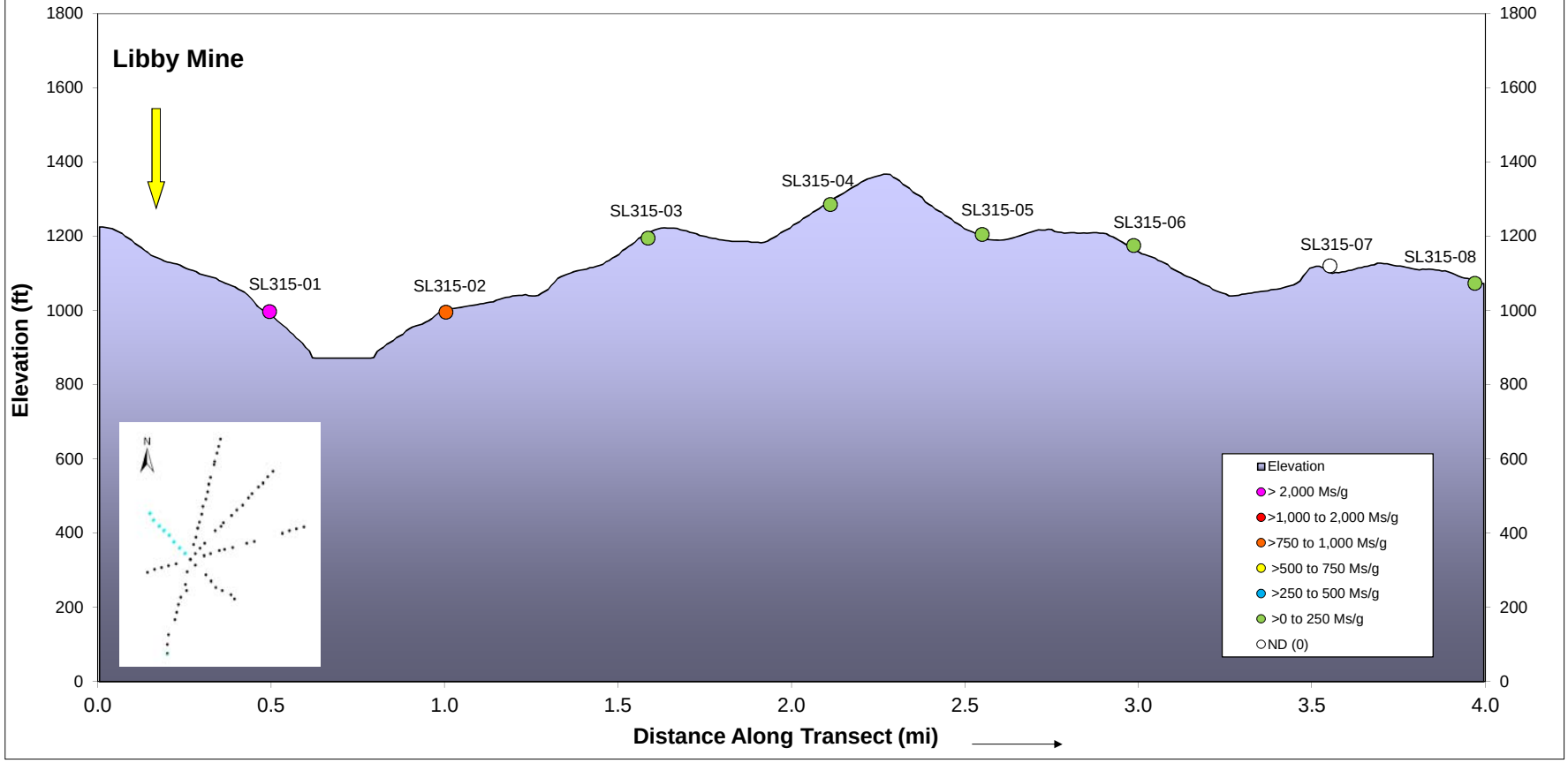


Figure 6-19

Asbestos Levels in Duff Along Transect 315º



Path: R:\85158-OU3\3120.001-RA\GIS\MXD\Fig6-20_SoilDuffBark_Results.mxd

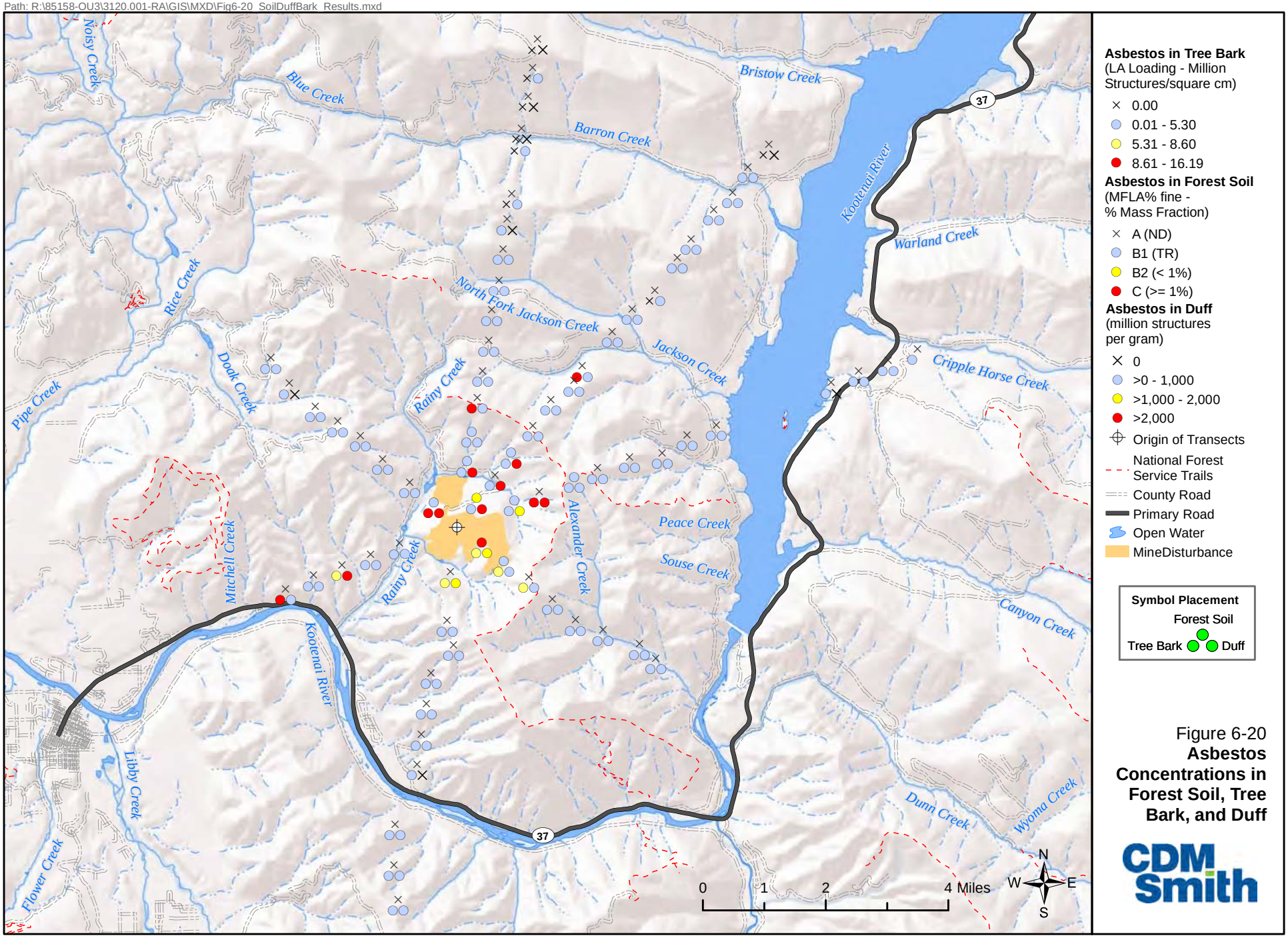
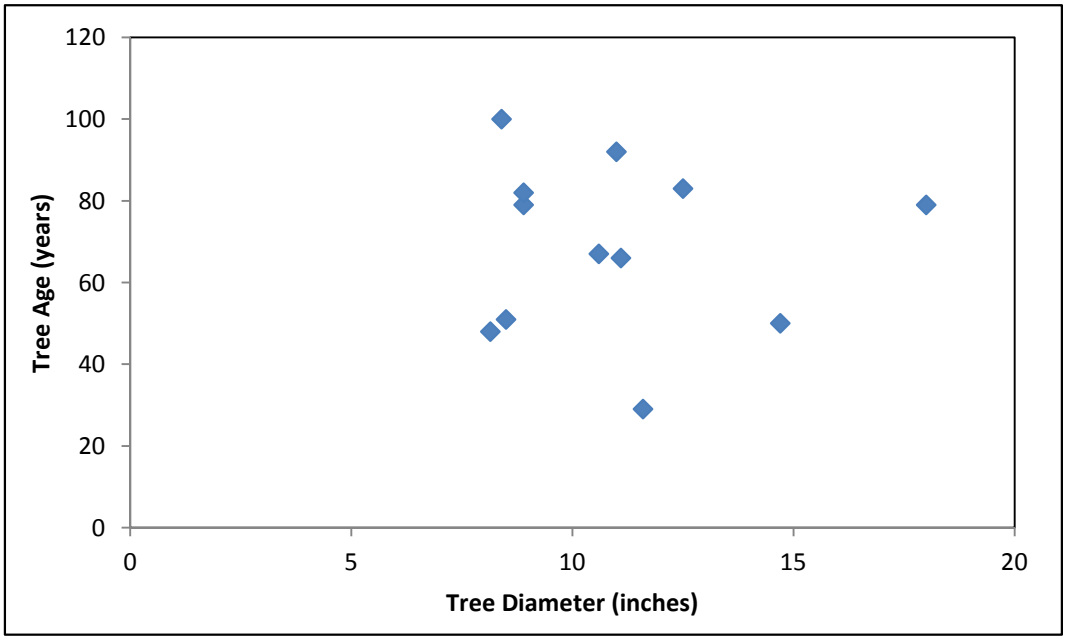


Figure 6-20
Asbestos Concentrations in Forest Soil, Tree Bark, and Duff

CDM Smith

FIGURE 6-21. TREE METRIC COMPARISONS

Panel A: Tree Diameter vs. Tree Age



Panel B: Tree Age vs. LA Surface Loading

LA = Libby amphibole

Ms/cm^2 = million structures per square centimeter