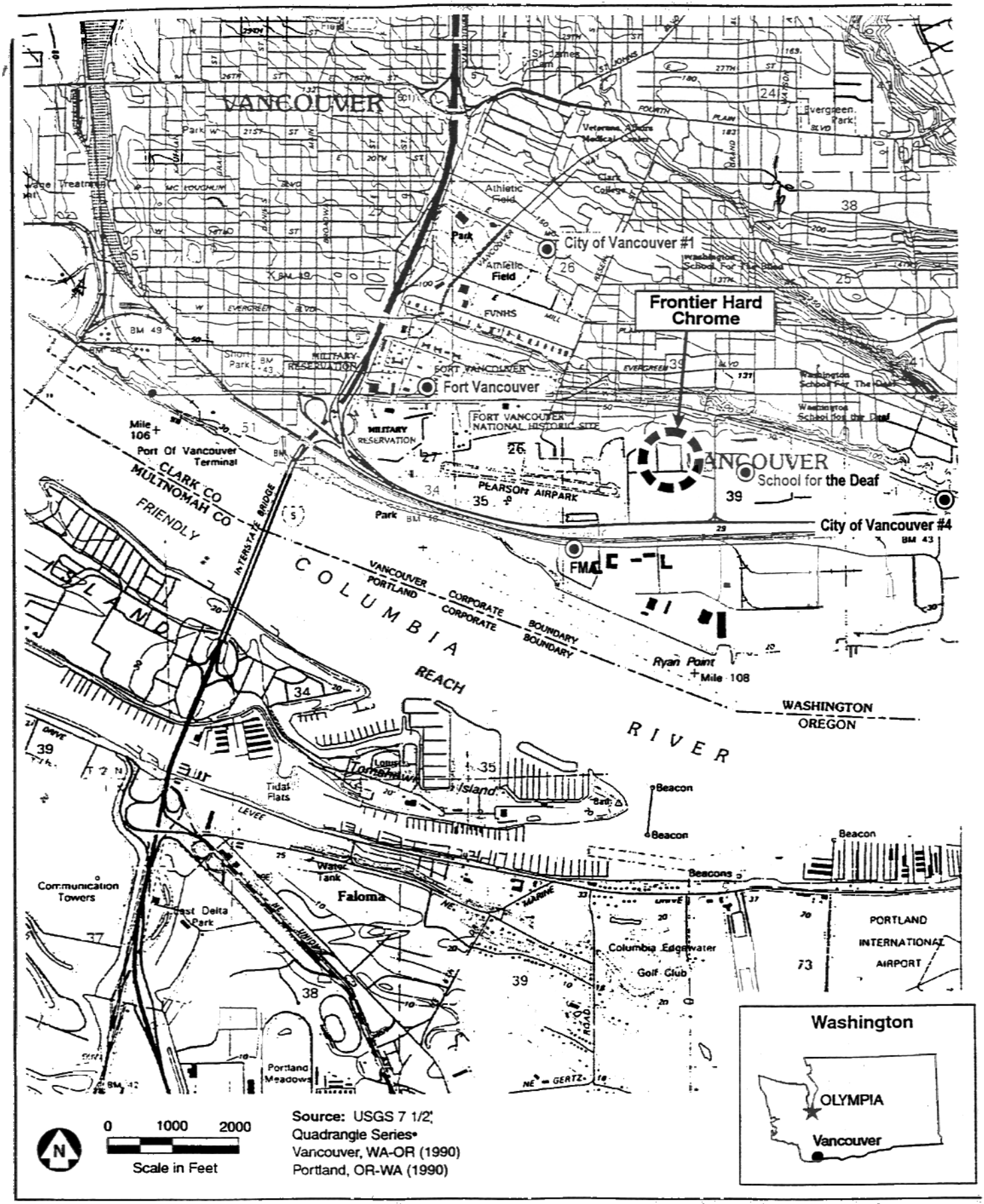

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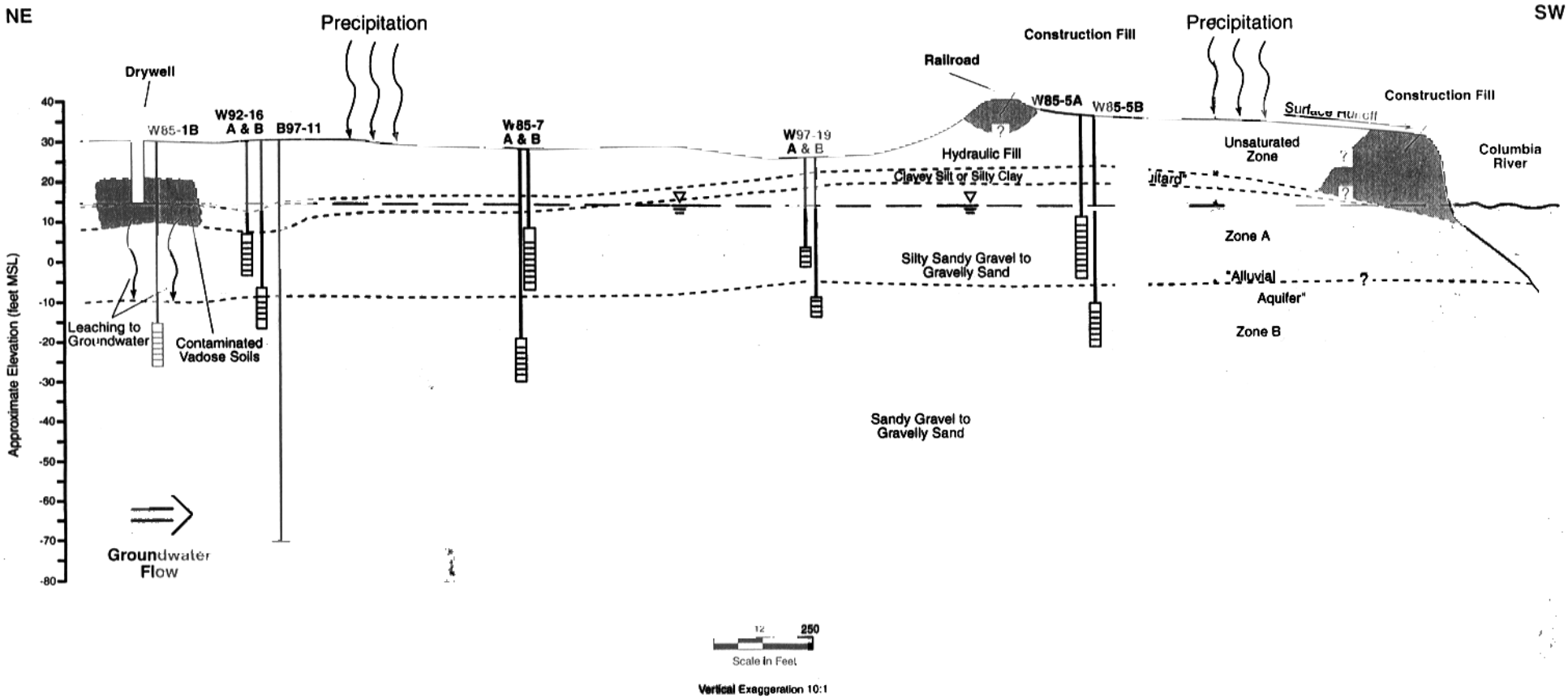
Figure 1
Frontier Hard Chrome Superfund Site
Vicinity Map

033-RI-CO-1027
Frontier Hard Chrome
PROPOSED PLAN



EXPLANATION

Monitoring Well

Note:

1) Groundwater elevation can vary by as much as 5 feet.

2) Water levels in the Columbia River can vary by as much as 10 feet due to seasonal and tidal influences.

Figure 1-2
Conceptual Hydrogeologic Model

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FEASIBILITY STUDY

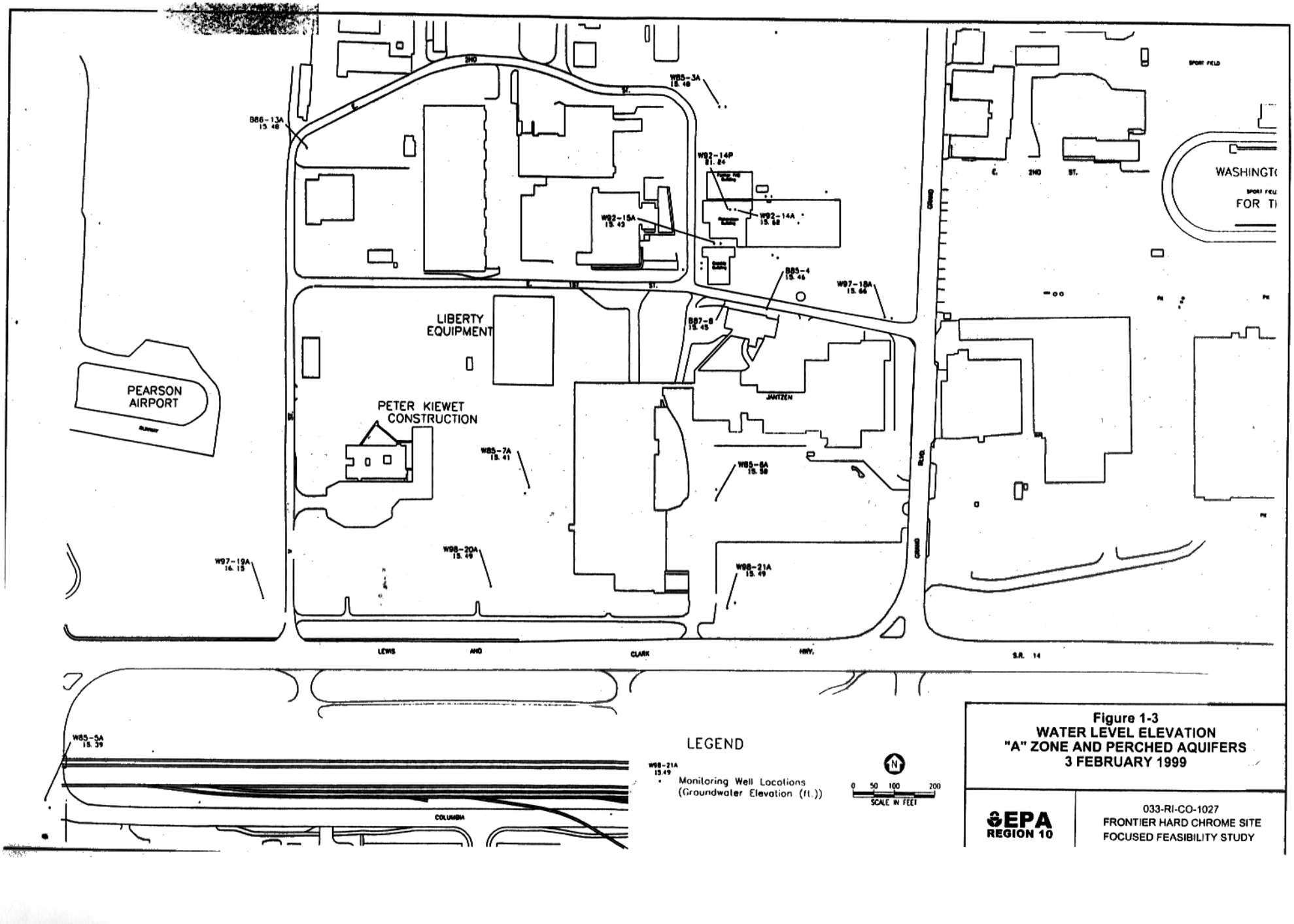

Figure 1-3
WATER LEVEL ELEVATION
"A" ZONE AND PERCHED AQUIFERS
3 FEBRUARY 1999

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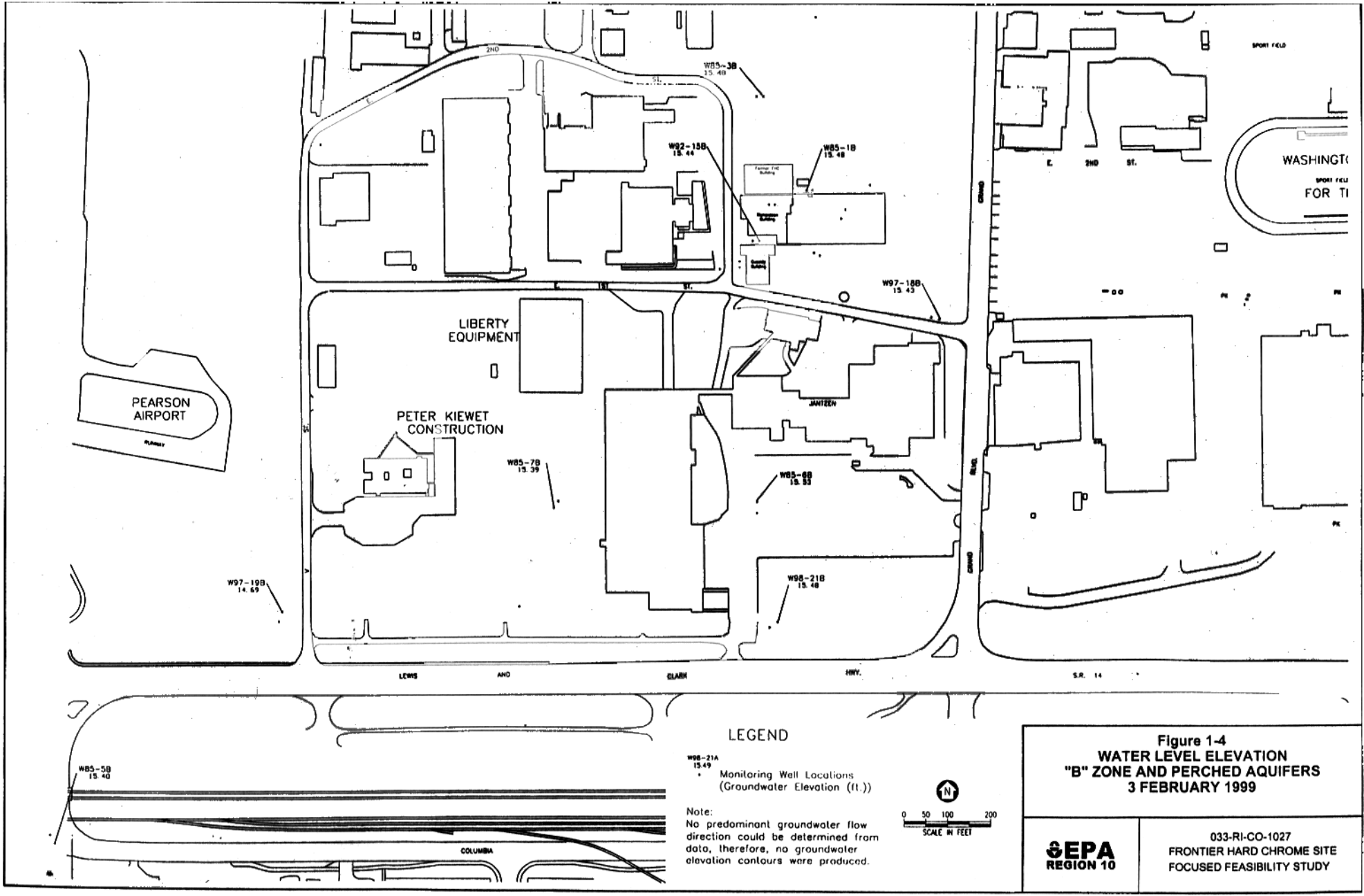
FRONTIER HARD CHROME SITE
FOCUSED FEASIBILITY STUDY


PEARSON AIRPORT
LIBERTY EQUIPMENT
PETER KIEWET CONSTRUCTION
JANITZEN
WASHINGTO
FOR TI
SPORT FIELD
E. 2ND ST.
2ND ST.
E. 1ST ST.
GRAND BLVD.
LEWIS AND CLARK HWY.
S.R. 14
COLUMBIA
W85-3B 15.48
W92-15B 15.44
W85-1B 15.48
W97-18B 15.43
W85-7B 15.39
W85-6B 15.53
W98-21B 15.48
W97-19B 14.69
W85-5B 15.40
LEGEND
W98-21A 15.49
Monitoring Well Locations (Groundwater Elevation (ft.))
Note:
No predominant groundwater flow direction could be determined from data, therefore, no groundwater elevation contours were produced.
N
0 50 100 200
SCALE IN FEET
Figure 1-4
WATER LEVEL ELEVATION
"B" ZONE AND PERCHED AQUIFERS
3 FEBRUARY 1999
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FRONTIER HARD CHROME SITE
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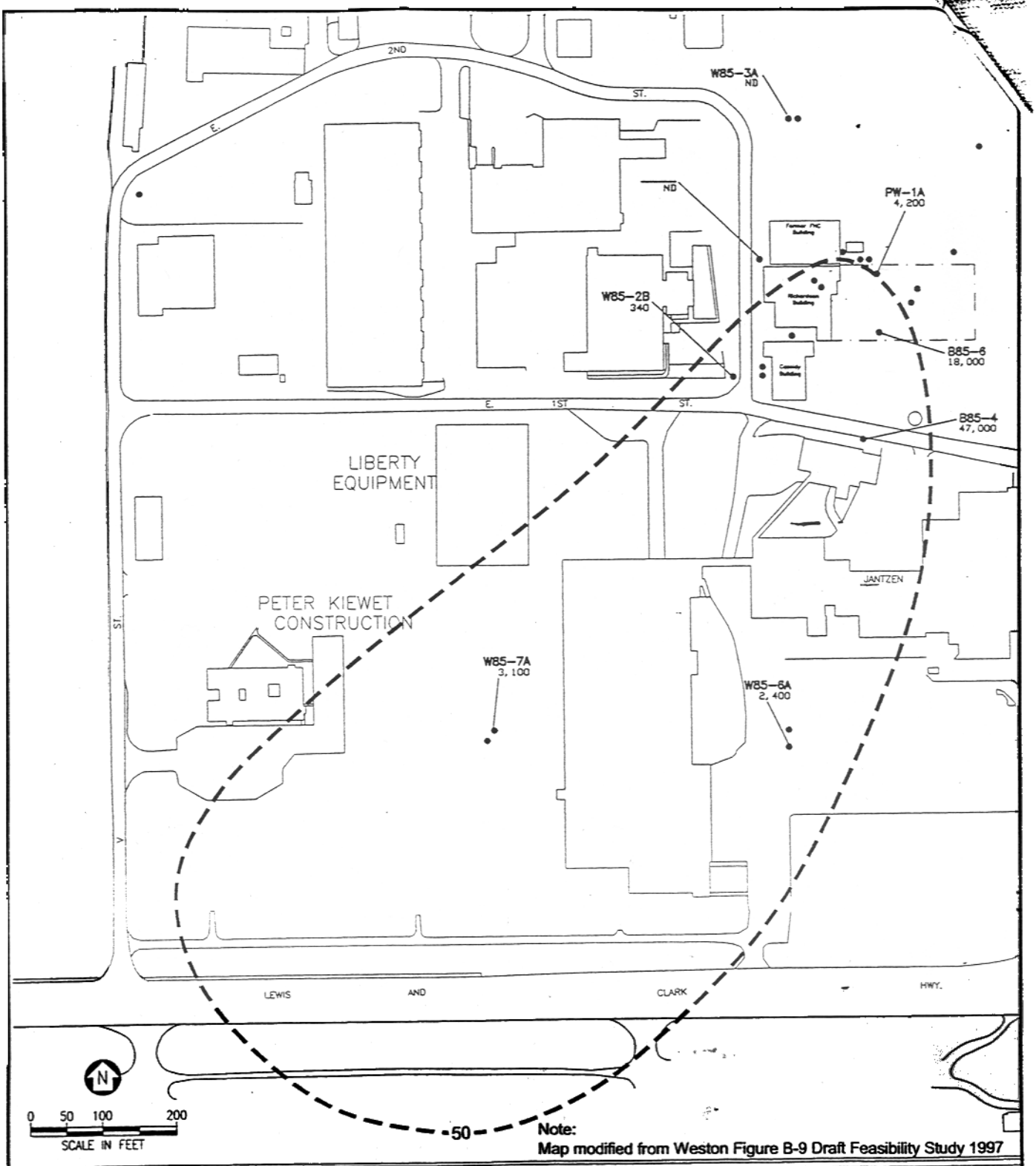

LEGEND

•	Monitoring Well Location Chromium Concentration (ug/L)
—50—	Concentration Contour (ug/L)
NS	Not Sampled
ND	Nondetected
50 ug/L	MTCA Method A Cleanup Level

Figure ~~4~~ 5
Chromium Concentrations in Groundwater
January 1986

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Frontier Hard Chrome Site
PROPOSED PLAN

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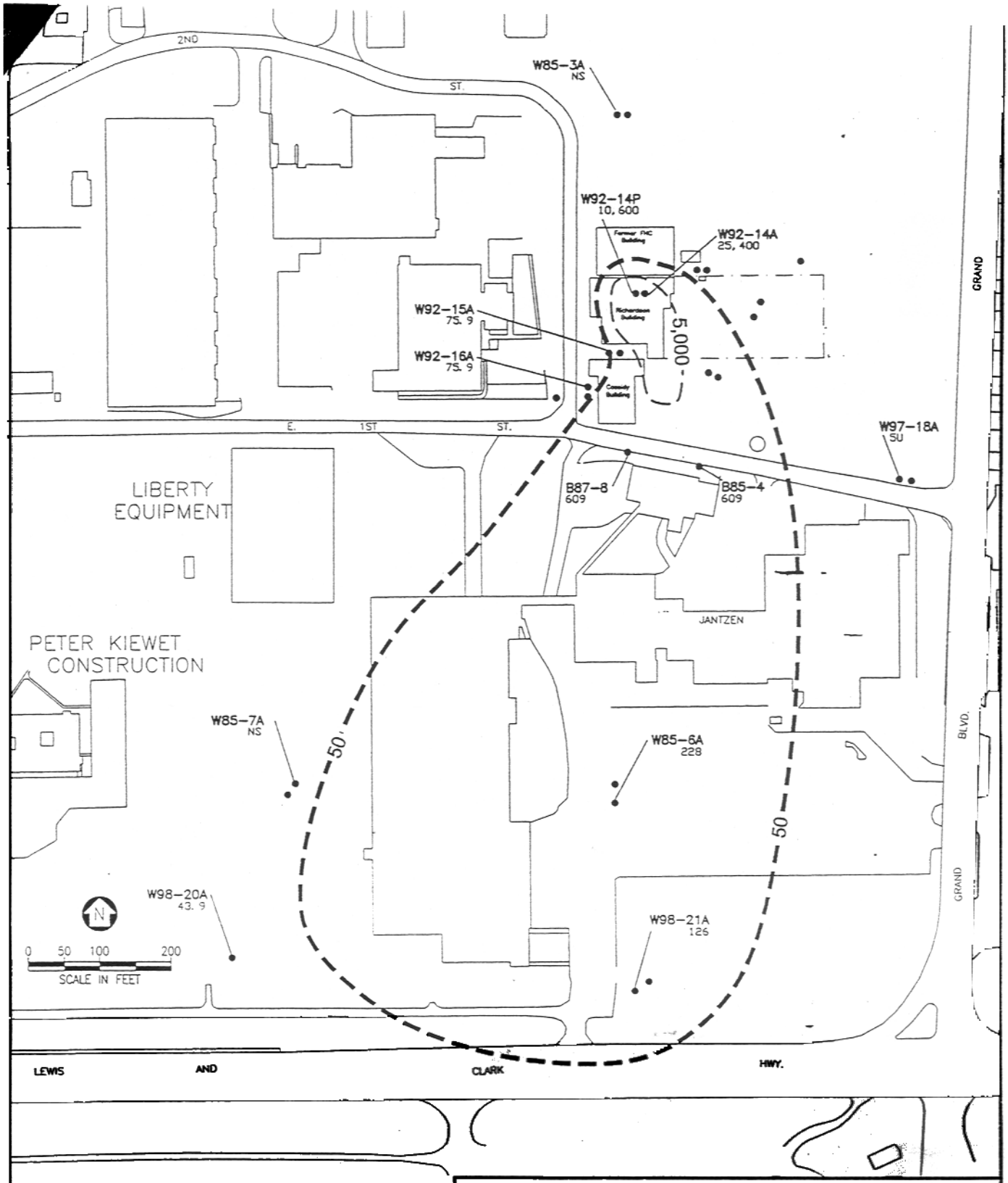

LEGEND

- • Monitoring Well Location Chromium Concentration (ug/L)
- — 50 — Concentration Contour (ug/L)
- NS Not Sampled
- ND Nondetected
- 50 ug/L MTCA Method A Cleanup Level

Figure ~~5~~6
Chromium Concentrations in Groundwater
June 2000

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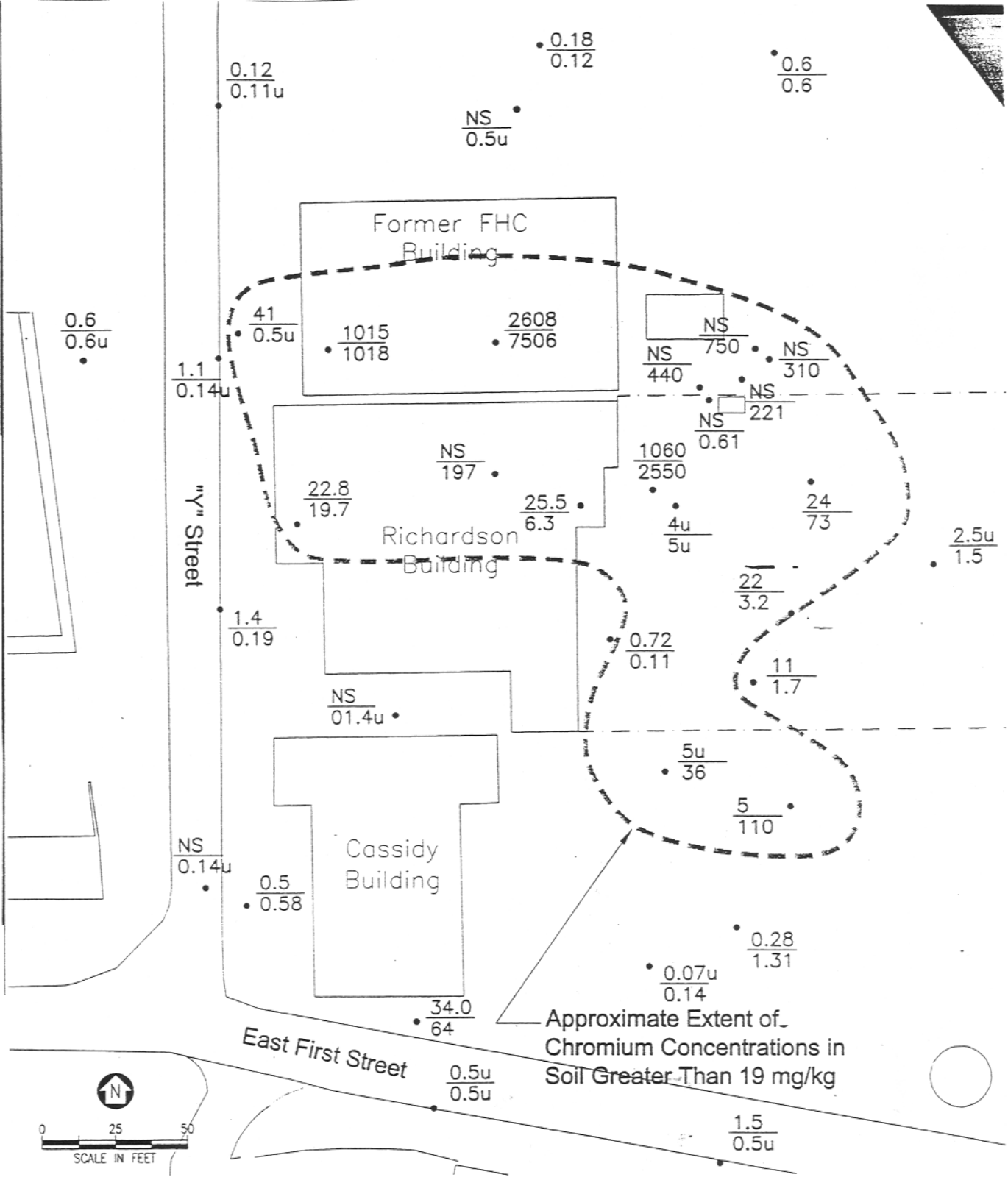
Frontier Hard Chrome Site
PROPOSED PLAN



LEGEND

1.5 — Hexavalent Chromium Concentration in Fill Layer Soil (mg/kg)

• 0.5u — Hexavalent Chromium Concentration in Silt Layer Soil (mg/kg)

u = Not detected at given detection limit

Figure 7
August 1999 - Concentrations of Hexavalent Chromium in Fill and Silt Soil

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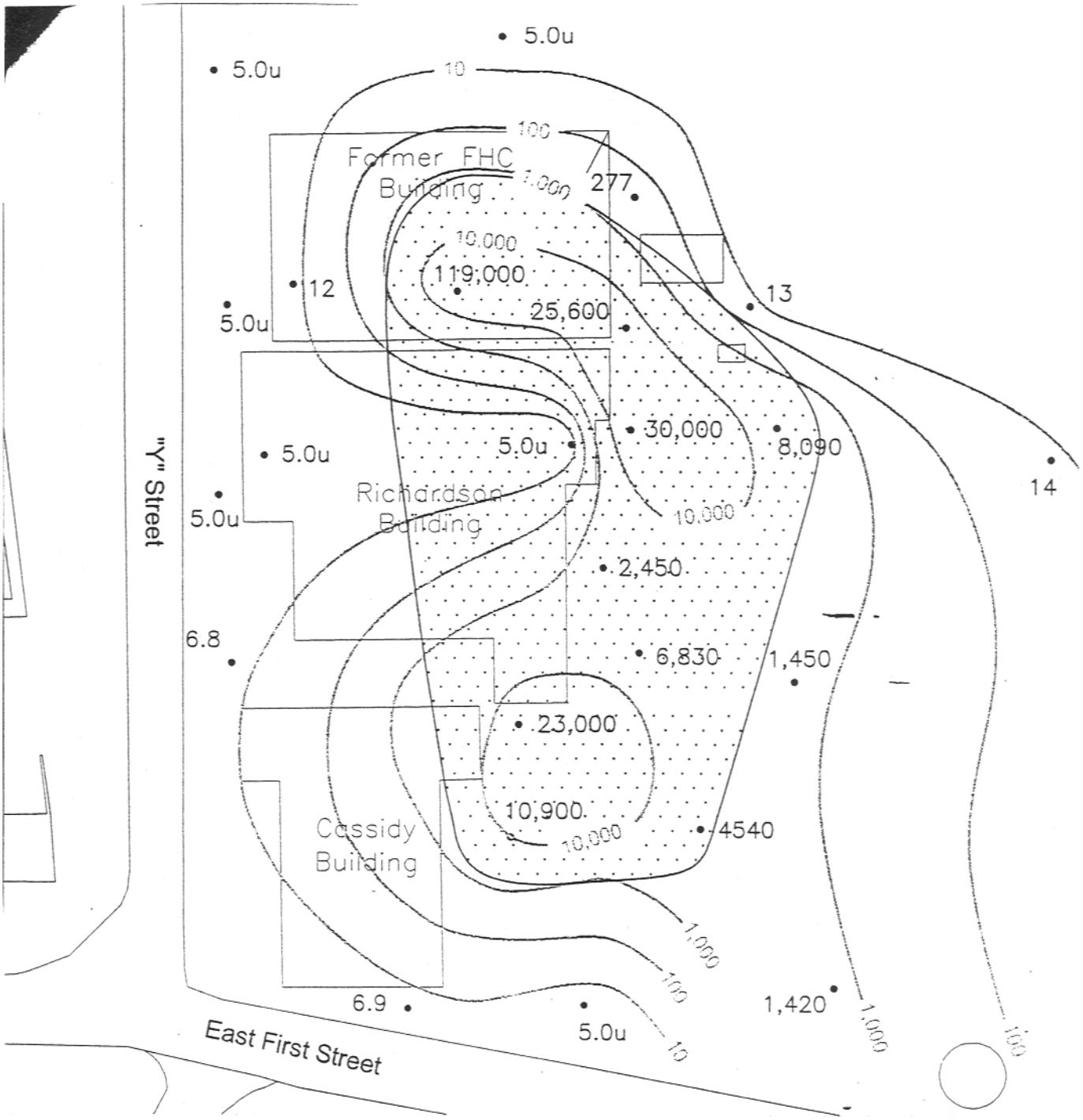
Frontier Hard Chrome Site
PROPOSED PLAN



LEGEND

Chromium (total) concentration distribution in groundwater (August 1999)

Approximate area of "A" zone aquifer with chromium (total) concentrations (August 1999) greater than 5,000 ug/L

357

Filtered Total Chromium Concentration (ug/L) (Direct-push sampling locations)

u = Not detected at given detection limit

N

0 25 50
SCALE IN FEET

Note:
Groundwater sample collected from temporary well points installed by direct-push method (Geoprobe™)

Figure ~~5~~ 9
Concentrations of Filtered Total Chromium in Groundwater August 1999

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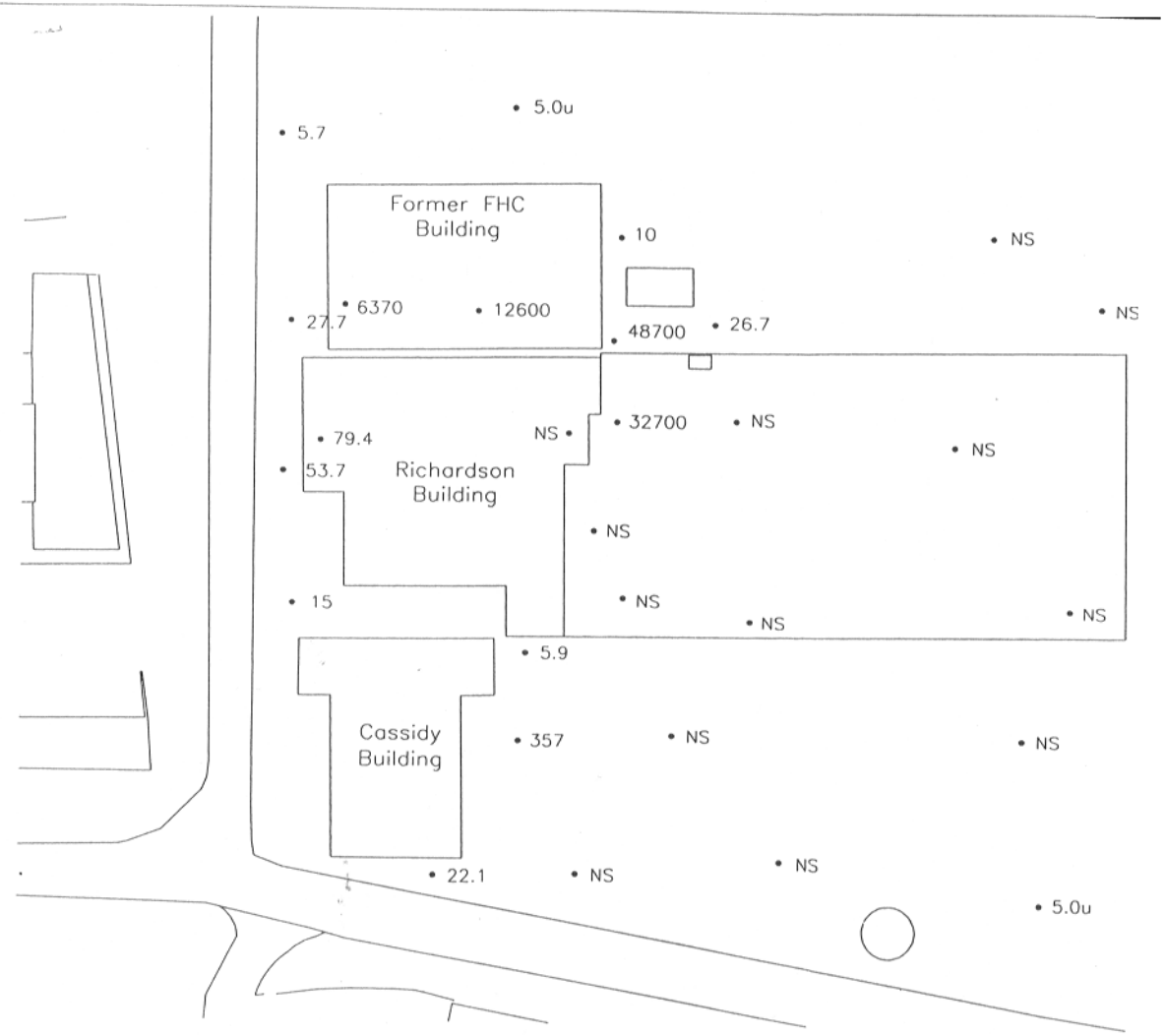
Frontier Hard Chrome Site
PROPOSED PLAN



Note:
Groundwater sample collected from temporary well points installed by direct push method (Geoprobe™)

LEGEND

357 • Filtered Total Chromium Concentration (ug/L) (Direct-push sampling locations)

NS = No Sample

u = Not detected at given detection limit

N

0 25 50
SCALE IN FEET

Figure 4
AUGUST 1999 - CONCENTRATIONS OF FILTERED TOTAL CHROMIUM IN PERCHED ZONE GROUNDWATER

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FOCUSED FEASIBILITY STUDY

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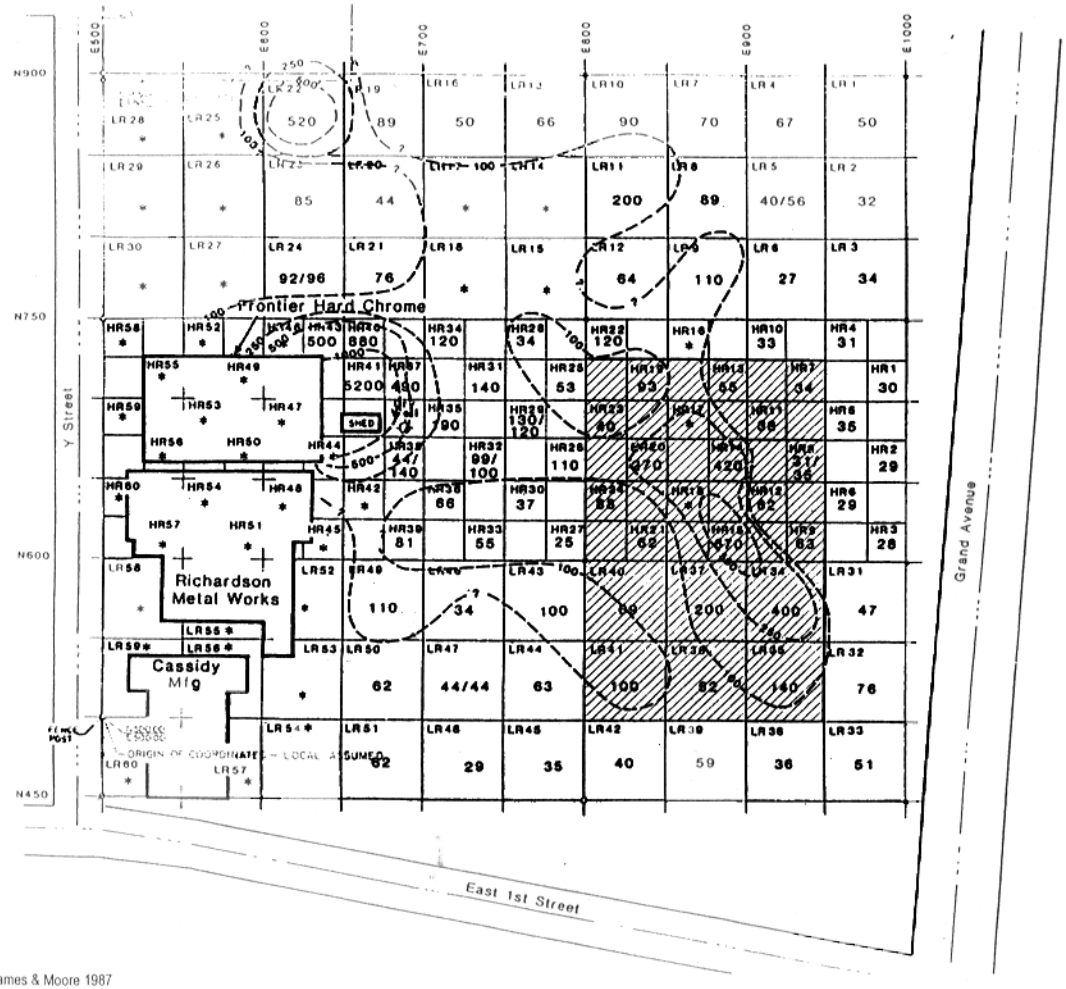

Source: Dames & Moore 1987

EXPLANATION

- Inferred Concentration Contour (mg/kg)
- 520 — Chromium in PPM (mg/kg) Dry Weight Basis
- HR — High Resolution Sample Grid Block 25' by 25' Square
- LR — Low Resolution Sample Grid Block 50' by 50' Square
- High Resolution Sample Grid Block Not Included in Sampling
- HR16 * — Grid Block Not Sampled
- Dry Well
- Building
- E50000 — Survey Coordinate

Notes:

1. Site and grid locations surveyed by Jim Weddle Associates, Inc.
2. Sec. 35, T2N, R1E, Willamette Meridian, Vancouver, Clark Co., Washington.
3. Sample Analyses of upper 1-foot from shallow soil borings S-7, S-8, S-9, S-10 considered in placing contour intervals.

Area Where Ecology Conducted Surface Soil Removal Action

0 50 100
Approximate Scale in Feet

Figure 10
Total Chromium Concentrations in Surface Soil

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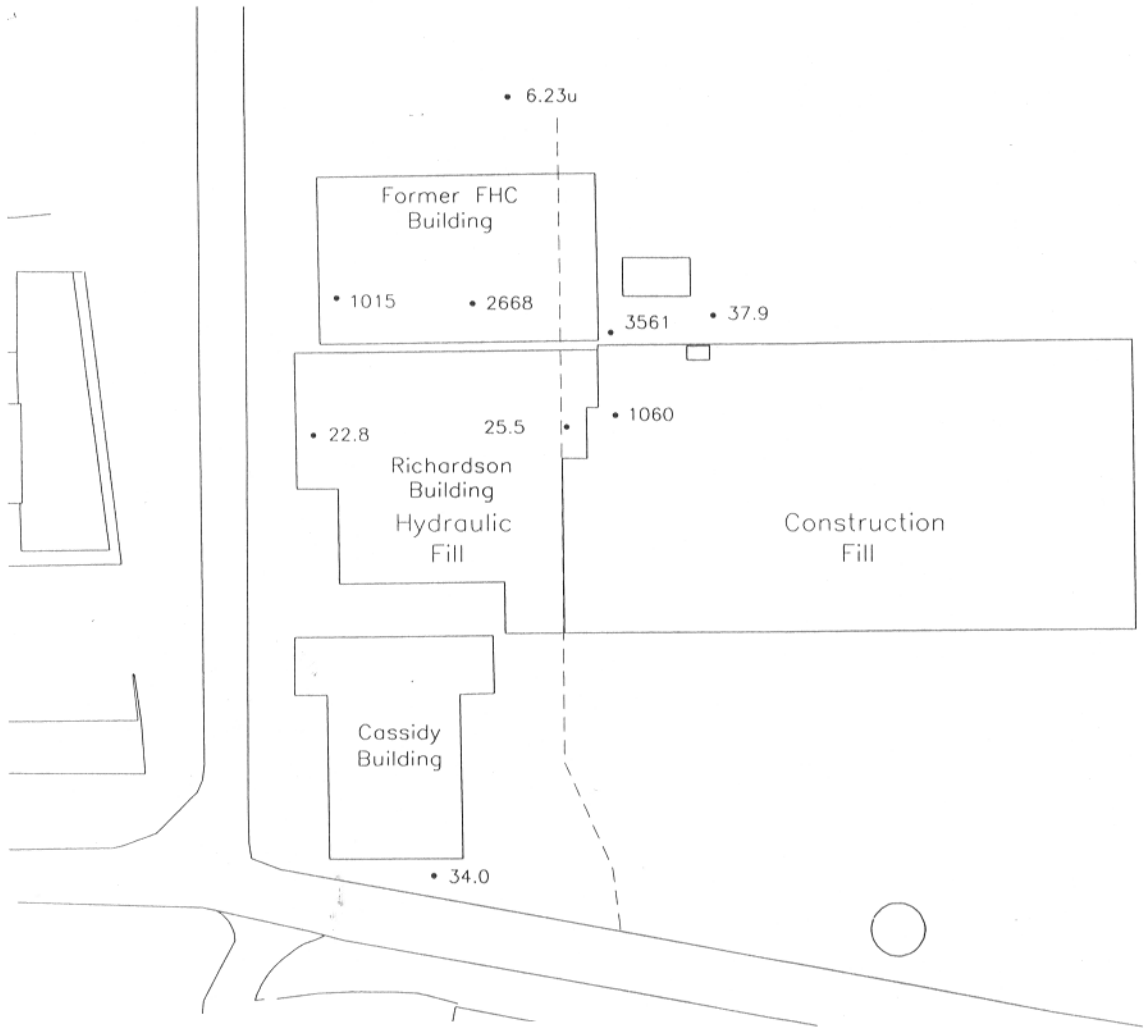
Frontier Hard Chrome
FOCUSED
FEASIBILITY STUDY



LEGEND

34.1 • Hexavalent Chromium Concentration (mg/kg)

Not detected at given detection limit

N

0 25 50
SCALE IN FEET

Figure [redacted] 11
AUGUST 1999 - CONCENTRATIONS OF HEXAVALENT CHROMIUM IN FILL SOIL

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FRONTIER HARD CHROME SITE
FOCUSED FEASIBILITY STUDY

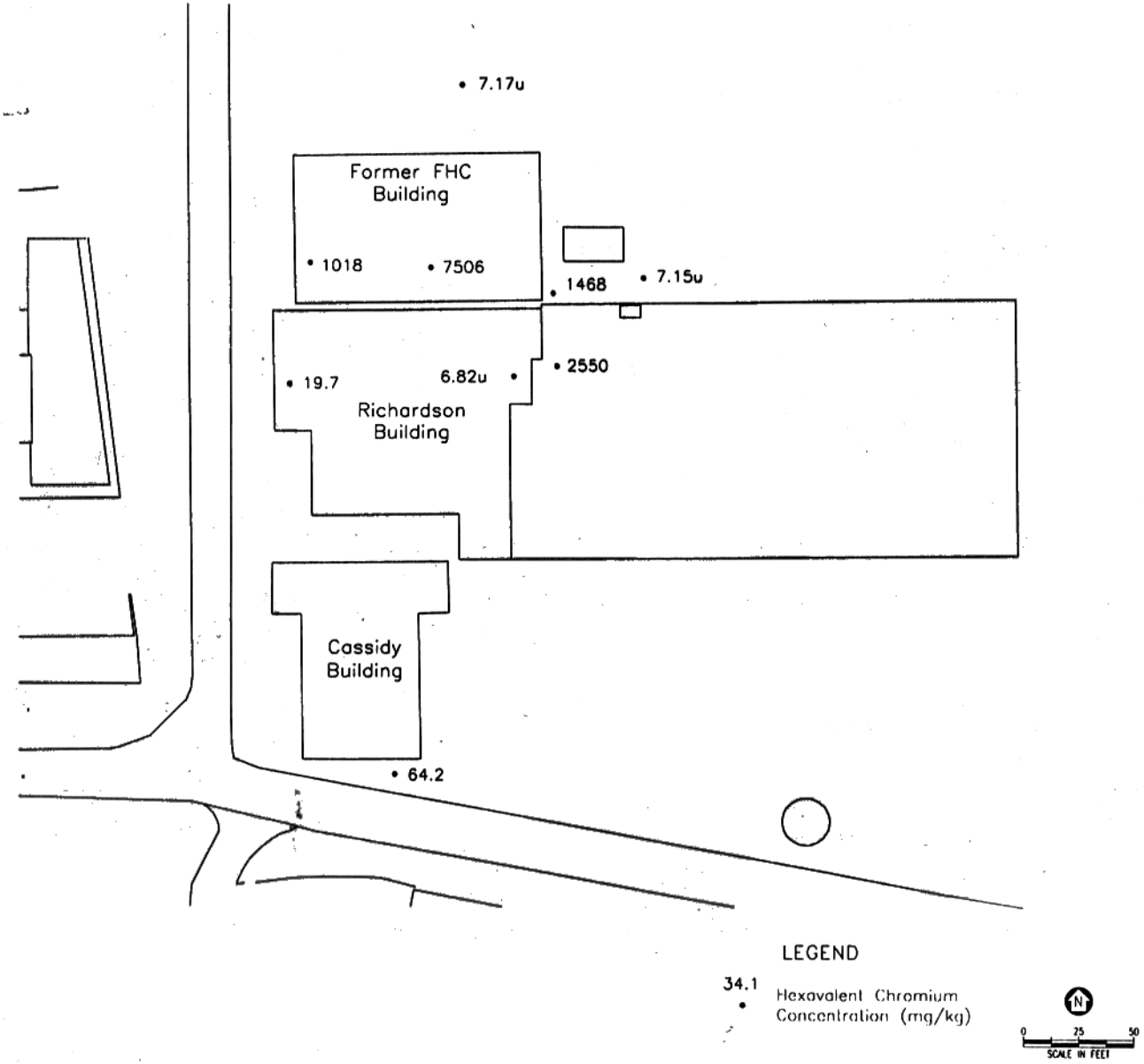

Figure 12
AUGUST 1999 - CONCENTRATIONS OF HEXAVALENT CHROMIUM IN SILT LAYER SOIL

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033-RI-CO-1027
FRONTIER HARD CHROME SITE
FOCUSED FEASIBILITY STUDY