ES302 - Geostats Forum Scenario
Case Study of Mountain Fir Lumber Site, Independence, Oregon

INTRODUCTION

The Mountain Fir site is located at 900 F Street in Independence, Oregon. The site is comprised of a total of 14 acres throughout the city. Much of the property is located in the vicinity of low-density residential neighborhoods and city land. Lumber was produced at the Mountain Fir site from approximately 1940 to 1992. Mountain Fir occupied portions of the site from 1953 to present. Historically, the facility included a sawmill and barker, planer, a shop, a dry kiln and cooling shed, a log pond (impoundment of Ash Creek) with log decks on either side, buildings, storage sheds, sawdust and shavings bunkers, and lumber storage yards (refer to Figure 1). The Mountain Fir property is zoned for heavy industrial use, with adjacent areas zoned for residential and agricultural activities.

SITE HISTORY AND ENVIRONMENTAL CONCERNS

The sawmill was established in 1939 with Ash Creek dammed for use as a log pond. The Oregon Dept. of Environmental Quality has been monitoring the Mountain Fir site since the early 1990's when a Phase 1 property investigation revealed the potential for site soil and water contamination. Further investigation into the historic mill activities revealed the following potential contaminant pathways (refer to Figure 3 for site locations):

(1) Sawmill / Barker Area - historical use of hydraulic oil and lubricants
(2) Planer Shed Area - historical use of Permatox lumber anti-stain agent (pentachlorophenate)
(3) Shop Area - historical use of petroleum products and cleaning solvents
(4) Transformer Area - use of transformer oils (PCB's)
(5) Rein Mill Area - use of petroleum products
(6) Gravel Roads - use of petroleum products and waste fluids for dust suppression
(7) Log Pond Areas - hydraulic sink and surface drainage collection point

The Mountain Fir site has been investigated by a number of environmental consulting companies since the early 1990's. Assessment activities include monitoring well installation, test borings, soil sampling, groundwater quality analysis, and surface water quality analysis. The attached Figures 1-2 is a location map showing the site configuration, monitoring well locations, and sampling points. Tables 3 summarizes groundwater quality data from wells on Fig. 1-2.

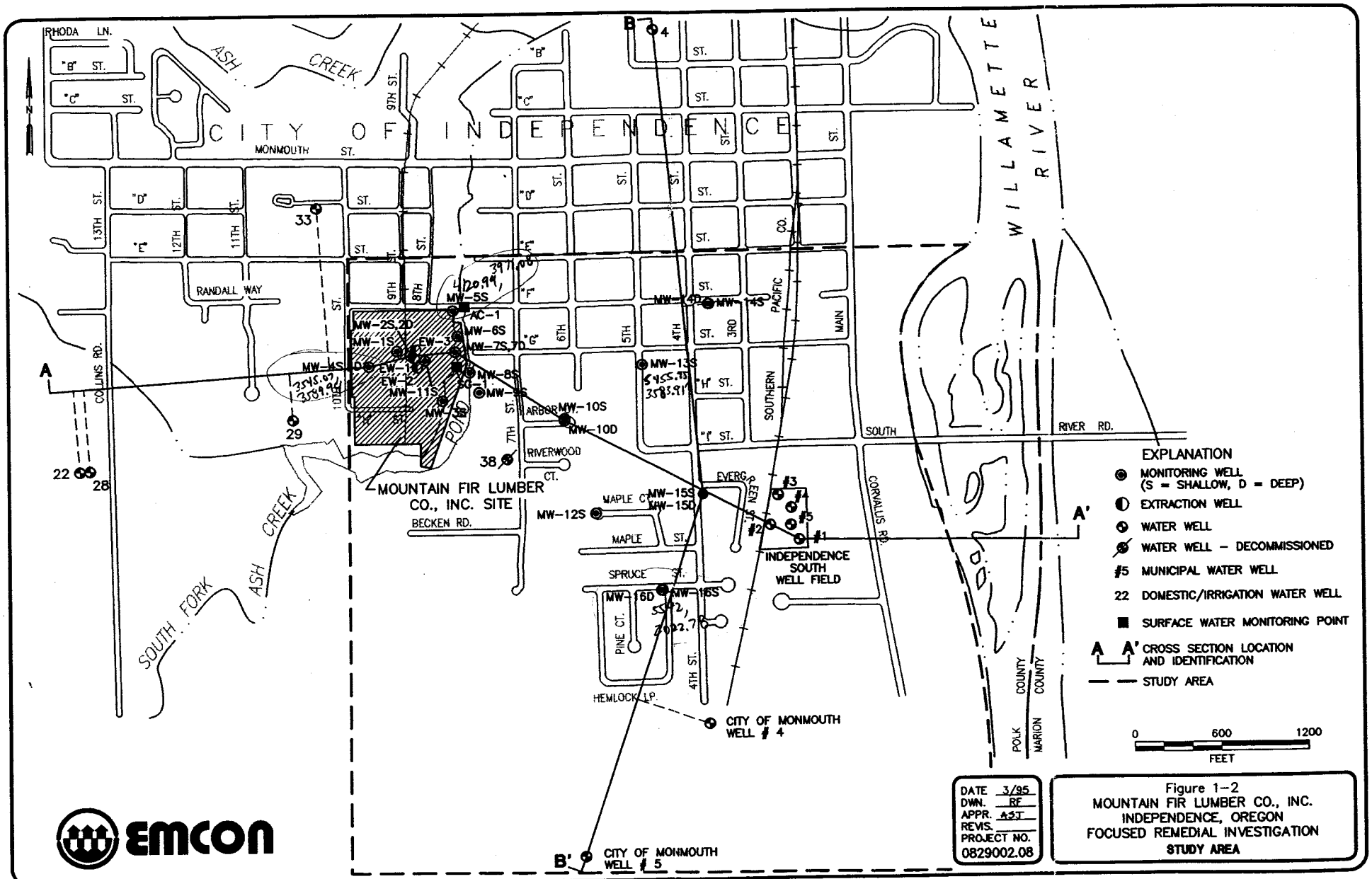
CITY OF INDEPENDENCE
WILLAMETTE RIVER
ASH CREEK
SOUTH FORK ASH CREEK
RHODA LN.
MONMOUTH ST.
RANDALL WAY
COLLINS RD.
MOUNTAIN FIR LUMBER CO., INC. SITE
BECKEN RD.
MAPLE CT.
MAPLE ST.
SPRUCE ST.
PINE CT.
HEMLOCK LP.
4TH ST.
RIVERWOOD CT.
ARBOR
EVERGREEN
SOUTHERN
PACIFIC
MAIN
CORVALLIS RD.
SOUTH RIVER RD.
POLK COUNTY
MARION COUNTY
INDEPENDENCE SOUTH WELL FIELD
CITY OF MONMOUTH WELL # 4
CITY OF MONMOUTH WELL # 5
MW-1S
MW-2S,2D
MW-4S,4D
MW-5S
MW-6S
MW-7S,7D
MW-8S
MW-9S
MW-10S
MW-10D
MW-11S
MW-12S
MW-13S
MW-14S
MW-14D
MW-15S
MW-15D
MW-16S
MW-16D
AC-1
EW-1
EW-2
EW-3
SC-1
A
A'
B
B'
EXPLANATION
MONITORING WELL (S = SHALLOW, D = DEEP)
EXTRACTION WELL
WATER WELL
WATER WELL – DECOMMISSIONED
#5 MUNICIPAL WATER WELL
22 DOMESTIC/IRRIGATION WATER WELL
SURFACE WATER MONITORING POINT
A A' CROSS SECTION LOCATION AND IDENTIFICATION
STUDY AREA
0 600 1200
FEET
DATE 3/95
DWN. RF
APPR. ASJ
REVIS.
PROJECT NO. 0829002.08
Figure 1-2
MOUNTAIN FIR LUMBER CO., INC.
INDEPENDENCE, OREGON
FOCUSED REMEDIAL INVESTIGATION
STUDY AREA
EMCON
G:\DWG\0829\002\BASEMAP 12-01-95 GJS
PLOT AT 1 = 600

Table 3. Mountain Fir Water Quality Data

Monitoring Point	Date	Tetrachloro-phenol (mg/L)	Pentachloro-phenol (mg/L)
MW-1S	7/8/1993	1 U	NA
MW-1S	12/17/1993	1 U	NA
MW-1S	2/2/1995	NA	NA
MW-1S	7/27/1995	0.5 U	NA
MW-2S	7/8/1995	3200	NA
MW-2S	12/16/1993	3900	11000
MW-2S	2/2/1995	2900	12000
MW-2S	7/27/1995	300	1700
MW-2S	10/25/1995	4900	21000
MW-2D	12/17/1993	1 U	1 U
MW-2D	2/2/1995	0.5 U	0.5 U
MW-2D	7/27/1995	0.5 U	0.5 U
MW-3S	12/16/1993	1 U	1 U
MW-3S	2/2/1995	0.5 U	0.5 U
MW-3S	7/27/1995	0.5 UJ	0.5 UJ
MW-4S	12/17/1993	1 U	1 U
MW-4S	7/27/1995	0.5 UJ	0.5 UJ
MW-4D	12/16/1993	1 U	1 U
MW-4D	7/27/1995	0.5 UJ	0.5 UJ
MW-5S	12/16/1993	1 U	1 U
MW-5S	2/1/1995	0.5 U	0.5 U
MW-5S	7/27/1995	0.5 U	0.5 U
MW-6S	12/16/1993	1 U	1 U
MW-6S	2/1/1995	NA	NA
MW-6S	7/27/1995	0.5 UJ	0.5 UJ
MW-6S	10/24/1995	NA	NA
MW-7S	12/16/1993	9.7	42
MW-7S	2/1/1995	0.5 U	0.5 U
MW-7S	4/24/1995	0.5 U	0.7
MW-7S	7/27/1995	1.3	2.7
MW-7S	10/24/1995	3	13
MW-7D	12/16/1993	1 U	1 U
MW-7D	2/1/1995	0.5 U	0.5 U
MW-7D	7/27/1995	0.5 UJ	0.5 UJ
MW-8S	3/3/1994	28	18
MW-8S	2/2/1995	19.1	16.1
MW-8S	4/24/1995	78	96
MW-8S	7/27/1995	23.5	33
MW-8S	10/24/1995	9.4	9.4
MW-9S	3/3/1994	28	180
MW-9S	2/2/1995	240	320
MW-9S	4/24/1995	310	340
MW-9S	7/27/1995	133	190
MW-9S	10/24/1995	93	150
MW-10S	1/13/1995	98	8.1
MW-10S	1/19/1995	24.9	4.3
MW-10S	2/2/1995	13.7	2.8
MW-10S	4/24/1995	4.7	0.8
MW-10S	7/26/1995	0.8	0.5 U
MW-10S	10/24/1995	0.5	0.5 U
MW-10D	2/8/1995	3.6	1.1
MW-10D	2/28/1995	25.6	31
MW-10D	3/31/1995	12.4	8.5
MW-10D	4/24/1995	3.4	0.9
MW-10D	7/26/1995	0.5 U	0.5 U
MW-10D	10/24/1995	0.5 U	0.5 U
MW-11S	4/24/1995	880	1500
MW-11S	7/27/1995	560	1350
MW-11S	10/25/1995	290	620

CODE EXPLANATION
NA = not analyzed
U = analyte not detected at or above method reporting limit
J = associated value is an estimated quantity
R = surrogate recovery below 10 percent. Not Acceptable for Use
dup = duplicate sample
μg/L = micrograms per liter
ppm - parts per million

MW-12S	2/9/1995	0.5 U	0.5 U
MW-12S	2/28/1995	0.5 U	0.5 U
MW-12S	10/24/1995	0.5 U	0.5 U
MW-13S	2/10/1995	0.5 U	0.5 U
MW-13S	2/28/1995	4	1.8
MW-13S	3/31/1995	3.4	1.2
MW-13S	4/24/1995	2.7	0.8
MW-13S	7/26/1995	2	1.6
MW-13S	10/24/1995	3.6	1.7
MW-14S	6/22/1995	0.5 R	0.5 R
MW-14S	7/26/1995	1.1	0.5 U
MW-14S	10/24/1995	0.5 U	0.5 U
MW-14D	6/22/1995	0.5 U	0.5 U
MW-14D	10/24/1995	0.5 U	0.6
MW-14D	11/13/1995	0.5 U	0.5 U
MW-15S	6/22/1995	0.5 U	0.5 U
MW-15S	7/26/1995	0.5 U	0.6
MW-15S	10/25/1995	0.5 U	0.5 U
MW-15D	6/22/1995	1	0.5 U
MW-15D	7/26/1995	0.5	0.5 U
MW-15D	10/25/1995	0.7	1
MW-15D	11/13/1995	0.5	0.5 U
MW-16S	6/22/1995	0.5U	0.5 U
MW-16S	10/24/1995	0.5 U	0.5 U
MW-16D	6/22/1995	0.5 U	0.5 U
MW-16D	10/24/1995	0.5 U	2.4
MW-16D	11/13/1995	0.5 U	0.5 U