



GETTLER-RYAN INC.

ENVIRONMENTAL PROTECTION

99 APR 22 PM 2:15

TRANSMITTAL

2nd Revised

TO: Ms. Juliet Shin
Alameda County Health Services Agency
Division of Environmental Protection
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

DATE: April 21, 1999
PROJ. #: 140165.05
SUBJECT: RBCA Evaluation (SSTLs)
Unocal Station No. 1871
Oakland, California

CC: David B. DeWitt, Tosco
Barbara Bee, Property Owner

FROM:
David J. Vossler *DJV*
Project Manager
Gettler-Ryan Inc.
7100 Redwood Blvd., Suite 104
Novato, California 94945

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	April 20, 1999	RBCA Evaluation Work Sheets SSTL values

THESE ARE TRANSMITTED as checked below:

[X] For review and comment [X] As requested [X] For Your Files

COMMENTS:

As requested, we are forwarding you a copy of the RBCA Evaluation Worksheets 6.1 through 6.3 for the Tosco SS No. 1871 located at 96 MacArthur Blvd, in Oakland California. I have made the corrections as we discussed during our meeting yesterday. The attached Worksheets provide both the SSTLs for the construction worker as well as the risk potential for the planned building. If you would like a formal letter report to accompany these evaluations, please contact me so that it can be prepared. If you have any questions, please call me at (415) 893-1515.



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SUBJECT: RBCA Evaluation Worksheet

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FROM:

David J. Vossler *DJV*
 Project Manager
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 7100 Redwood Blvd., Suite 104
 Novato, California 94945

Post-it® Fax Note	7671	Date	4.21.99	# of pages	5
To	Juliet/Madhulla		From	Dave Vossler	
Co./Dept.			Co.		
Phone #			Phone #		
Fax #			Fax #		

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Madhulla, 4/26
It looks like the changes David Vossler made are correct & the site passes. But could you take a closer look at it to be sure. Thx again for all your effort!

Juliet

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Former Tosco (former Unocal) Site Identification: 140165.05
 Site Location: 96 MacArthur Blvd., Oakland, CA Date Completed: 4/20/99
 Completed By: David J. Vossler

Software: GSI RBCA Spreadsheet
 Version: 1.0.1

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF_Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m ³ /day)	15			20	
IRa.out	Inhalation rate outdoor (m ³ /day)	20			20	10
SA	Skin surface area (dermal) (cm ²)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm ² -yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm ²)	<u>8.4E+05</u>	
W	Length of affect. soil parallel to wind (cm)	<u>9.1E+02</u>	
W.gw	Length of affect. soil parallel to groundwater (cm)	<u>3.0E+02</u>	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)		
Pe	Particulate areal emission rate (g/cm ² /s)	6.9E-14	

Groundwater Parameters	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	<u>5.7E+00</u>
Ugw.tr	Groundwater seepage velocity (cm/yr)	<u>1.5E+01</u>
Ka	Saturated hydraulic conductivity (cm/s)	6.0E-07
grad	Groundwater gradient (cm/cm)	3.0E-01
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03
BIO?	Is bioattenuation considered?	TRUE
BC	Biodegradation Capacity (mg/L)	

Matrix of Exposed Persons to Complete Exposure Pathways	Residential		Commercial/Industrial	
	Chronic	Constrctn	Chronic	Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	TRUE	TRUE
S.v	Volatilization from Subsurface Soils	FALSE	TRUE	
GW.v	Volatilization from Groundwater	FALSE	TRUE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	FALSE	TRUE	
GW.b	Vapors from Groundwater	FALSE	TRUE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	FALSE	TRUE	TRUE
Groundwater Pathways:				
GW.I	Groundwater Ingestion	FALSE	FALSE	
S.I	Leaching to Groundwater from all Soils	FALSE	FALSE	

Soil Parameters	Definition (Units)	Value
hc	Capillary zone thickness (cm)	5.0E+00
hv	Vadose zone thickness (cm)	<u>3.4E+02</u>
rho	Soil density (g/cm ³)	1.7
foc	Fraction of organic carbon in vadose zone	0.01
phi	Soil porosity in vadose zone	0.38
Lgw	Depth to groundwater (cm)	<u>3.4E+02</u>
Ls	Depth to top of affected subsurface soil (cm)	<u>2.7E+02</u>
Lsubs	Thickness of affected subsurface soils (cm)	<u>6.8E+01</u>
pH	Soil/groundwater pH	6.5
<hr/>		
		capillary vadose foundation
phi.w	Volumetric water content	0.342 <u>0.12</u> <u>0.13</u>
phi.a	Volumetric air content	0.038 0.26 <u>0.28</u>

Matrix of Receptor Distance and Location On- or Off-Site	Residential		Commercial/Industrial	
	Distance	On-Site	Distance	On-Site
GW	Groundwater receptor (cm)	TRUE		TRUE
S	Inhalation receptor (cm)	TRUE		TRUE

Building Parameters	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (h ⁻¹)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	<u>2.5E+01</u>	
eta	Foundation crack fraction	<u>0.005</u>	

Matrix of Target Risks	Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06
TRc	Target Risk (class C carcinogens)	1.0E-05
THQ	Target Hazard Quotient	1.0E+00
Opt	Calculation Option (1, 2, or 3)	1
Tier	RBCA Tier	2

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.1

Site Name: Former Tosco (former Unocal) SS # 1871

Completed By: David J. Vossler

Site Location: 96 MacArthur Blvd., Oakland, Ca.

Date Completed: 4/20/1999

1 OF 1

**SURFACE SOIL SSTL VALUES
(< 0 FT BGS)**

Target Risk (Class A & B) 1.0E-6

MCL exposure limit?

Calculation Option: 1

Target Risk (Class C) 1.0E-5

PEL exposure limit?

Target Hazard Quotient 1.0E+0

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			X	Ingestion, Inhalation and Dermal Contact		X	Construction Worker	Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Commercial: (on-site)	(mg/kg)	■ ■ If yes	Only if "yes" left		
71-43-2	Benzene	1.4E-2	NA	NA	NA	NA	3.3E+0	1.1E+2	3.3E+0	<input type="checkbox"/>	<1		
100-41-4	Ethylbenzene	1.5E-2	NA	NA	NA	NA	>Res	>Res	>Res	<input type="checkbox"/>	<1		
1634-04-4	Methyl t-Butyl Ether	4.8E+0	NA	NA	NA	NA	1.7E+2	2.4E+2	1.7E+2	<input type="checkbox"/>	<1		
108-88-3	Toluene	5.0E-2	NA	NA	NA	NA	>Res	>Res	>Res	<input type="checkbox"/>	<1		
1330-20-7	Xylene (mixed isomers)	2.6E-2	NA	NA	NA	NA	>Res	>Res	>Res	<input type="checkbox"/>	<1		

>Res indicates risk-based target concentration greater than constituent residual saturation value

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: Former Tosco (former Unocal) SS # 1871

Completed By: David J. Vossler

Site Location: 96 MacArthur Blvd., Oakland, Ca.

Date Completed: 4/20/1999

1 OF 1

**SUBSURFACE SOIL SSTL VALUES
(> 0 FT BGS)**

Target Risk (Class A & B) 1.0E-6

MCL exposure limit?

Calculation Option: 1

Target Risk (Class C) 1.0E-5

PEL exposure limit?

Target Hazard Quotient 1.0E+0

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration (mg/kg)	Soil Leaching to Groundwater			X	Soil Volatilization to Indoor Air		X	Soil Volatilization to Outdoor Air		Applicable SSTL (mg/kg)	SSTL Exceeded ? * If yes	Required CRF Only if "yes" left
			Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)					
71-43-2	Benzene	2.0E-1	NA	NA	NA	NA	2.3E-1	NA	1.6E+2	2.3E-1	<input type="checkbox"/>	<1		
100-41-4	Ethylbenzene	8.0E-1	NA	NA	NA	NA	>Res	NA	>Res	>Res	<input type="checkbox"/>	<1		
1634-04-4	Methyl t-Butyl Ether	4.9E+0	NA	NA	NA	NA	2.0E+3	NA	>Res	2.0E+3	<input type="checkbox"/>	<1		
108-88-3	Toluene	2.9E-1	NA	NA	NA	NA	2.7E+2	NA	>Res	2.7E+2	<input type="checkbox"/>	<1		
1330-20-7	Xylene (mixed isomers)	1.9E+0	NA	NA	NA	NA	>Res	NA	>Res	>Res	<input type="checkbox"/>	<1		

>Res indicates risk-based target concentration greater than constituent residual saturation value

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: Former Tosco (former Unocal) SS # 1871

Completed By: David J. Vossler

Site Location: 96 MacArthur Blvd., Oakland, Ca.

Date Completed: 4/20/1999

1 OF 1

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6

MCL exposure limit?

Calculation Option: 1

Target Risk (Class C) 1.0E-5

PEL exposure limit?

Target Hazard Quotient 1.0E+0

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration (mg/L)	Groundwater Ingestion			Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL (mg/L)	SSTL Exceeded ? * If yes	Required CRF Only if "yes" left
			Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)			
71-43-2	Benzene	1.4E-1	NA	NA	NA	NA	1.4E-1	NA	3.1E+1	1.4E-1	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	5.2E-3	NA	NA	NA	NA	>Sol	NA	>Sol	>Sol	<input type="checkbox"/>	<1
1634-04-4	Methyl t-Butyl Ether	5.9E-1	NA	NA	NA	NA	1.0E+4	NA	>Sol	1.0E+4	<input type="checkbox"/>	<1
108-88-3	Toluene	8.9E-3	NA	NA	NA	NA	1.6E+2	NA	>Sol	1.6E+2	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	2.6E-1	NA	NA	NA	NA	>Sol	NA	>Sol	>Sol	<input type="checkbox"/>	<1

>Sol indicates risk-based target concentration greater than constituent solubility

Groundwater

Sample #

Benzene Toluene Ethyl-benzene Xylenes M+BE

EB-1	0.00025	0.00025	0.00025	0.0013	0.00025
EB-2	0.69	0.041	0.025	0.064	0.00025
EB-3	0.00025	0.00025	0.00025	0.00025	0.0036
MW-4	0.00025	0.00025	0.00025	0.00025	2.92
WO-Water	0.0025	0.0025	0.0025	0.0025	0.0025
Average -	0.14	0.0089	0.0052	0.26	0.59

ND - listed as 1/2 of DL

All concentrations in ppm

Subsurface Soils

Sample #s

SW-3 @ 5'	0.049	0.051	0.05	0.2	6.6
SW-4 @ 5'	0.08	0.01	0.01	0.039	12
SW-1 @ 11.5'	0.01	0.01	0.01	0.01	1.9
SW-2 @ 11.5'	0.031	0.01	0.01	0.015	3.8
MW-4 @ 5'	0.0025	0.0025	0.0052	0.019	-
MW-4 @ 9.5'	0.0025	0.74	0.015	0.48	-
EB-1 @ 5'	0.0025	0.0025	0.0025	0.0025	-
EB-1 @ 10'	0.0025	0.0025	0.0025	0.0025	-
EB-2 @ 10'	0.0025	0.0025	0.0094	0.035	-
EB-2 @ 5'	0.0025	0.0025	0.0025	0.0025	-
EB-3 @ 9.5'	0.0025	0.0025	0.0025	0.0025	0.025
WOSW2 @ 9'	2.2	2.6	9.5	22	-
Average -	0.20	0.29	0.80	1.90	4.87

ND - listed as 1/2 of DL

All conc. reported in ppm

13702 500 SHEETS FULL R. 1 SQUARE
42381 50 SHEETS FULL R. 1 SQUARE
42382 100 SHEETS FULL R. 1 SQUARE
42383 200 SHEETS FULL R. 1 SQUARE
42384 400 SHEETS FULL R. 1 SQUARE
42385 800 SHEETS FULL R. 1 SQUARE
42386 1600 SHEETS FULL R. 1 SQUARE
42387 3200 SHEETS FULL R. 1 SQUARE
42388 6400 SHEETS FULL R. 1 SQUARE
42389 12800 SHEETS FULL R. 1 SQUARE
42390 25600 SHEETS FULL R. 1 SQUARE
42391 51200 SHEETS FULL R. 1 SQUARE
42392 102400 SHEETS FULL R. 1 SQUARE
42393 204800 SHEETS FULL R. 1 SQUARE
42394 409600 SHEETS FULL R. 1 SQUARE
42395 819200 SHEETS FULL R. 1 SQUARE
42396 1638400 SHEETS FULL R. 1 SQUARE
42397 3276800 SHEETS FULL R. 1 SQUARE
42398 6553600 SHEETS FULL R. 1 SQUARE
42399 13107200 SHEETS FULL R. 1 SQUARE
42400 26214400 SHEETS FULL R. 1 SQUARE
42401 52428800 SHEETS FULL R. 1 SQUARE
42402 104857600 SHEETS FULL R. 1 SQUARE
42403 209715200 SHEETS FULL R. 1 SQUARE
42404 419430400 SHEETS FULL R. 1 SQUARE
42405 838860800 SHEETS FULL R. 1 SQUARE
42406 1677721600 SHEETS FULL R. 1 SQUARE
42407 3355443200 SHEETS FULL R. 1 SQUARE
42408 6710886400 SHEETS FULL R. 1 SQUARE
42409 13421772800 SHEETS FULL R. 1 SQUARE
42410 26843545600 SHEETS FULL R. 1 SQUARE
42411 53687091200 SHEETS FULL R. 1 SQUARE
42412 107374182400 SHEETS FULL R. 1 SQUARE
42413 214748364800 SHEETS FULL R. 1 SQUARE
42414 429496729600 SHEETS FULL R. 1 SQUARE
42415 858993459200 SHEETS FULL R. 1 SQUARE
42416 1717986918400 SHEETS FULL R. 1 SQUARE
42417 3435973836800 SHEETS FULL R. 1 SQUARE
42418 6871947673600 SHEETS FULL R. 1 SQUARE
42419 13743895347200 SHEETS FULL R. 1 SQUARE
42420 27487790694400 SHEETS FULL R. 1 SQUARE
42421 54975581388800 SHEETS FULL R. 1 SQUARE
42422 109951162777600 SHEETS FULL R. 1 SQUARE
42423 219902325555200 SHEETS FULL R. 1 SQUARE
42424 439804651110400 SHEETS FULL R. 1 SQUARE
42425 879609302220800 SHEETS FULL R. 1 SQUARE
42426 1759218604441600 SHEETS FULL R. 1 SQUARE
42427 3518437208883200 SHEETS FULL R. 1 SQUARE
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42429 14073748835532800 SHEETS FULL R. 1 SQUARE
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42434 450359962737049600 SHEETS FULL R. 1 SQUARE
42435 900719925474099200 SHEETS FULL R. 1 SQUARE
42436 1801439850948198400 SHEETS FULL R. 1 SQUARE
42437 3602879701896396800 SHEETS FULL R. 1 SQUARE
42438 7205759403792793600 SHEETS FULL R. 1 SQUARE
42439 14411518807585587200 SHEETS FULL R. 1 SQUARE
42440 28823037615171174400 SHEETS FULL R. 1 SQUARE
42441 57646075230342348800 SHEETS FULL R. 1 SQUARE
42442 115292150460684697600 SHEETS FULL R. 1 SQUARE
42443 230584300921369395200 SHEETS FULL R. 1 SQUARE
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42446 1844674407370955161600 SHEETS FULL R. 1 SQUARE
42447 3689348814741910323200 SHEETS FULL R. 1 SQUARE
42448 7378697629483820646400 SHEETS FULL R. 1 SQUARE
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42454 472236648286964521369600 SHEETS FULL R. 1 SQUARE
42455 944473296573929042739200 SHEETS FULL R. 1 SQUARE
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42457 3777893186295716170956800 SHEETS FULL R. 1 SQUARE
42458 7555786372591432341913600 SHEETS FULL R. 1 SQUARE
42459 15111572745182864683827200 SHEETS FULL R. 1 SQUARE
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42461 60446290980731458735308800 SHEETS FULL R. 1 SQUARE
42462 120892581961462917470617600 SHEETS FULL R. 1 SQUARE
42463 241785163922925834941235200 SHEETS FULL R. 1 SQUARE
42464 483570327845851669882470400 SHEETS FULL R. 1 SQUARE
42465 967140655691703339764940800 SHEETS FULL R. 1 SQUARE
42466 1934281311383406679529881600 SHEETS FULL R. 1 SQUARE
42467 3868562622766813359059763200 SHEETS FULL R. 1 SQUARE
42468 7737125245533626718119526400 SHEETS FULL R. 1 SQUARE
42469 15474250491067253436239052800 SHEETS FULL R. 1 SQUARE
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42478 7922816251426433759354395033600 SHEETS FULL R. 1 SQUARE
42479 15845632502852867518708790067200 SHEETS FULL R. 1 SQUARE
42480 31691265005705735037417580134400 SHEETS FULL R. 1 SQUARE
42481 63382530011411470074835160268800 SHEETS FULL R. 1 SQUARE
42482 126765060022822940149670320537600 SHEETS FULL R. 1 SQUARE
42483 253530120045645880299340641075200 SHEETS FULL R. 1 SQUARE
42484 507060240091291760598681282150400 SHEETS FULL R. 1 SQUARE
42485 1014120480182583521197362564300800 SHEETS FULL R. 1 SQUARE
42486 2028240960365167042394725128601600 SHEETS FULL R. 1 SQUARE
42487 4056481920730334084789450257203200 SHEETS FULL R. 1 SQUARE
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42489 16225927682921336339157801028812800 SHEETS FULL R. 1 SQUARE
42490 32451855365842672678315602057625600 SHEETS FULL R. 1 SQUARE
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42493 259614842926741401426524816461004800 SHEETS FULL R. 1 SQUARE
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42498 830767497365572484564879412675353600 SHEETS FULL R. 1 SQUARE
42499 1661534994731144969129758825350707200 SHEETS FULL R. 1 SQUARE
42500 3323069989462289938259517510701414400 SHEETS FULL R. 1 SQUARE



Surface Soils	Benzene	Toluene	Ethyl-benzene	Xylene	MtBE
Samples #					

SW-3 @ 5'	0.049	0.51	0.05	0.02	6.6
SW-4 @ 5'	0.08	0.01	0.01	0.039	1.2
MW-4 @ 5'	0.0025	0.0025	0.0052	0.019	—
MW-1 @ 5'	0.0025	0.0025	0.0025	0.0025	—
MW-2 @ 5'	0.0025	0.0025	0.0025	0.0025	—
MW-3 @ 5'	0.0025	0.0025	0.0025	0.0025	—
MW-5 @ 5.5'	0.0025	0.0025	0.0025	0.0025	—
EB-1 @ 5'	0.0025	0.0025	0.0025	0.0025	—
EB-2 @ 5'	0.0025	0.0025	0.0025	0.0025	—
P1 @ 4'	0.0025	0.0025	0.0025	0.0025	0.74
P2 @ 4'	0.0025	0.056	0.10	0.19	0.025
Average	0.014	0.05	0.015	0.026	4.84

ND - listed as 1/2 DL
 All conc. in ppm