



WATER QUALITY ASSESSMENT

**Highway 18 Fuel Spill
September 4, 2006
San Bernardino National Forest**

October 31, 2007

Prepared For:

**U.S.D.A. FOREST SERVICE
SAN BERNARDINO NATIONAL FOREST
1209 Lytle Creek Road
Lytle Creek, CA 92358**

Prepared By:

**ROKEN ENGINEERING SERVICES
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ROKEN Project No. KAI-0097

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October 31, 2007

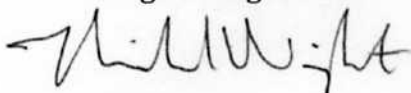
U.S.D.A. Forest Service
San Bernardino National Forest
1209 Lytle Creek Road
Lytle Creek, CA 92358

RE: WATER QUALITY ASSESSMENT
Highway 18 Gasoline Spill - September 4, 2006
San Bernardino National Forest
ROKEN Project No. KAI-0097

ROKEN Engineering Services (ROKEN) has completed the prescribed Water Quality Assessment for the above referenced site. The primary purpose of this assessment was to evaluate the environmental conditions resulting from a September 2006 truck accident that released gasoline into a ravine in the San Bernardino National Forest. The report is comprehensive, presenting pertinent details regarding the planning and execution of the workplan, field test and analytical results, the rationale applied to evaluate the results, and conclusions and recommendations.

We appreciate the opportunity to provide these services. Please contact us at your convenience, should you have any questions or comments regarding the information presented in this report.

Sincerely,
ROKEN Engineering Services



Michael Wright
Principal-Operations Manager



Expires October 31, 2009

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RISK MANAGEMENT

CONSTRUCTION
MANAGEMENT

ENVIRONMENTAL
SCIENCE & ENGINEERING

NATURAL RESOURCE
ASSESSMENT

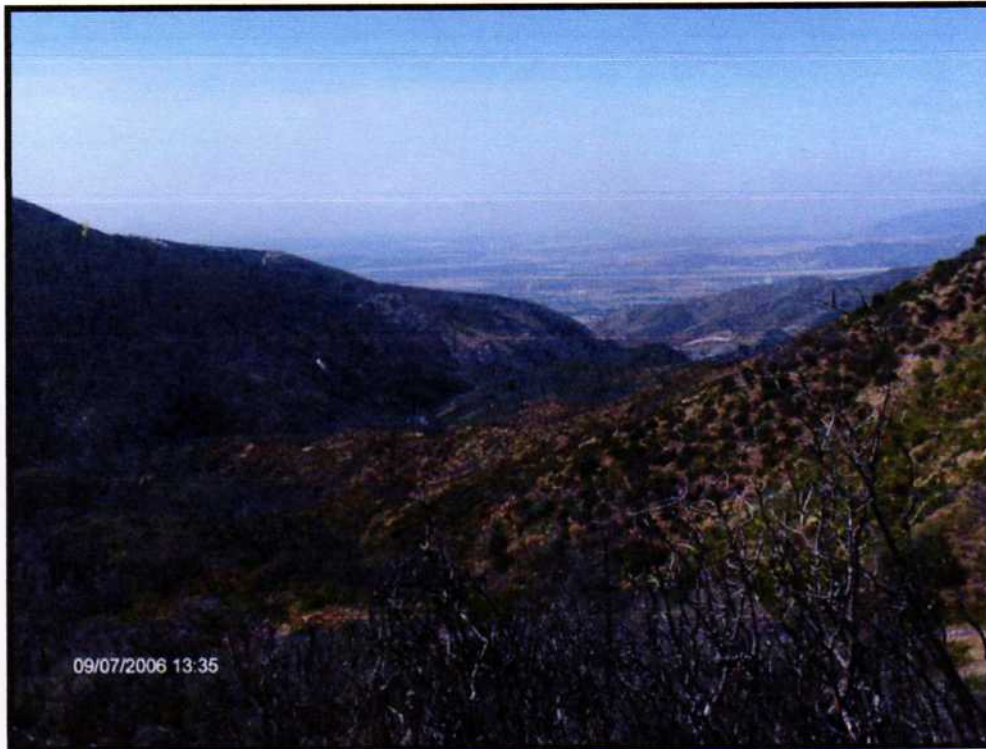


Photo 3: View southwest from top of Ravine. Devil Canyon leading to Resort and State Water Project - Inland Feeder and DWR Power Plant..



Photo 4: View south – East Fork of Devil Canyon Creek (foreground) and Pine Creek Resort (background).



Photo 15: Ravine sample location Ravine No. 5.



Photo 16: October 20, 2006 Remedial action at Highway 18 spill site - HMHTTC Vacuum Truck with Liquid Remediate™ at top of Ravine.

8.1 COMPARISON OF ANALYTICAL RESULTS WITH REGULATORY SITE SCREENING LEVELS

The following table presents a summary of the sediment sample analytical results compared to the regulatory site screening criteria as described in SECTION 6.4.3.

SEDIMENT – SUMMARY OF ANALYTICAL RESULTS

Compound	October 2006 to June 2007	June 2007	USEPA PRGs	USEPA SSL	NYDEC Benthitic Aquatic Life	NYDEC Benthitic Aquatic Life	MSSL (mg/kg)
	Highest Level Detected (mg/kg)	Highest Level Detected (mg/kg)	Residential (mg/kg)	DAF 1 (mg/kg)	Acute (mg/kg)	Chronic (mg/kg)	
n-Butylbenzene	34.1	ND	240	NA	NA	NA	NA
Ethylbenzene	201	ND	400	0.7	212	24	NA
Freon-12	0.0079 ⁽¹⁾	ND	94	NA	NA	NA	NA
Isopropylbenzene	24.7	ND	NA	NA	105	12	NA
4-Isopropyltoluene	0.753	ND	NA	NA	NA	NA	NA
Naphthalene	20.6	ND	56/1.7 ⁽²⁾	4	258	30	NA
n-Propylbenzene	90.2	ND	240	NA	NA	NA	NA
1,2,4-TMB	654	ND	52	NA	1,631	186	NA
1,3,5-TMB	181	ND	21	NA	NA	NA	NA
Toluene	123	ND	520	0.6	235	49	NA
m,p-Xylene	946	ND	270 ⁽³⁾	10 ⁽³⁾	833 ⁽³⁾	92 ⁽³⁾	NA
o-Xylene	339	ND	270 ⁽³⁾	10 ⁽³⁾	833 ⁽³⁾	92 ⁽³⁾	NA
TPH-g	13,800	117 ⁽⁴⁾	NA	NA	NA	NA	100

USEPA PRGs = Preliminary Remediation Goals from U.S EPA Region IX

SSL DAF 1 = PRG Site Screening Levels - Dilution Attenuation Factor 1, most stringent

NYDEC Benthitic Aquatic Life = Freshwater aquatic sediment screening levels for Acute and Chronic

MSSL = Maximum Soil Screening Levels for TPH above Drinking Water Aquifers, Guidance for Petroleum-Impacted Sites: Soil Screening Levels, California Water Board - Los Angeles Region, May 1996.

Freon-12 = Dichlorodifluoromethane reported in micrograms per kilogram (mg/kg)

TMB = Trimethylbenzene reported in micrograms per kilogram (mg/kg)

TPH-g = Total Petroleum Hydrocarbons as Gasoline reported in

ND = Not detected above the analytical method reporting limit

NA = Not applicable, Not available, Not listed in regulatory guidelines

⁽¹⁾Detected in one (1) sample only at low concentration – likely laboratory contaminant

⁽²⁾CAL-Modified PRG

⁽³⁾ Concentration for Total Xylenes

⁽⁴⁾ Detected at LQR No.4, approximate 10 ft. x 10 ft. area with localized gasoline residual

WATER – SUMMARY OF ANALYTICAL RESULTS

COMPOUND	Oct. 2006 to June 2007 Highest Level Detected (µg/l)	June 2007 Highest Level Detected (µg/l)	USEPA TAP WATER (µg/l)	USEPA MCL (µg/l)	NOAA SQuiRTS CCC (µg/l)	NYDEC Benthitic Aquatic Life Acute (µg/l)	NYDEC Benthitic Aquatic Life Chronic (µg/l)	USEPA Taste and Odor (µg/l)
Chloromethane	1.29 ⁽¹⁾	ND	160	NA	NA	NA	NA	NA
Ethylbenzene	4.14	ND	1,300	700	7.3	150	17	NA
4-Isopropyltoluene	5.97	5.97	NA	NA	NA	NA	NA	NA
Methylene Chloride	2.98	ND	4.3	NA	NA	NA	NA	NA
Naphthalene	2.48	ND	6.2/ 0.093⁽²⁾	NA	NA	110	13	NA
n-Propylbenzene	1.52	ND	240	NA	NA	NA	NA	NA
1,2,4-TMB	25	6.09	12	NA	NA	290	33	NA
1,3,5-TMB	7.13	1.68	12	NA	NA	NA	NA	NA
Toluene	10.4	ND	720	1,000	9.8	480	100	NA
m,p-Xylene	36.1	ND	210 ⁽³⁾	10,000 ⁽³⁾	13⁽³⁾	590 ⁽³⁾	65 ⁽³⁾	NA
o-Xylene	19.2	ND	210 ⁽³⁾	10,000 ⁽³⁾	13⁽³⁾	590 ⁽³⁾	65 ⁽³⁾	NA
TPH-g	356	ND	NA	NA	NA	NA	NA	5

USEPA TAP WATER = Preliminary Remediation Goals from U.S EPA Region IX

SSL DAF 1 = PRG Site Screening Levels - Dilution Attenuation Factor 1, most stringent.

USEPA MCL = Maximum Contaminant Level (MCL) - Primary Standard

NOAA SQuiRTS = Screening Quick Reference Tables water quality criteria for protection of aquatic organisms.

CCC = Criterion Continuous Concentration is estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.

Benthitic Aquatic Life = Freshwater aquatic water screening levels for Acute and Chronic developed by NYDEC.

USEPA MCL Taste and Odor = MCL Secondary Standard for odor and/or taste nuisance

TMB = Trimethylbenzene reported in micrograms per liter (µg/l)

TPH-g = Total Petroleum Hydrocarbons as Gasoline; Laboratory analytical method reporting limit = 100 µg/l.

ND = Not detected above the analytical method reporting limit.

NA = Not applicable, Not available, Not listed in regulatory guidelines

⁽¹⁾Detected in Trip Blank sample only – likely laboratory contaminant

⁽²⁾CAL-Modified PRG

⁽³⁾ Concentration for Total Xylenes