APPENDIX F

OPERATIONAL HEALTH RISK ASSESSMENT

CONTACT REPORT FORM

DATE:	10/1/2013	JOB No.:	CSAU-01.0
CONTACT:	Kevin Rahman	Phone No.:	415-331-4714
AGENCY/CO.:	Sausalito-Marin City Sanitary District	CONTACT BY:	Steve Bush
SUBJECT:	The Valhalla		

KEY POINTS DISCUSSED: Over the phone, Mr. Kevin Rahman informed me that the Sausalito-Marin City Sanitary District (District) operates an emergency diesel generator for a sewer lift station, located approximately 30 feet south of the project site. Mr. Rahman informed me that the 600 brake horse power (bhp) generator is tested bi-weekly (twice a month) for 30 minutes.

REQUIRED ACTION: Risk screening analysis to determine potential impacts.

CC:

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10/01/13

16:30:45
  ***  SCREEN3 MODEL RUN  ***
  *** VERSION DATED 96043 ***

 C:\Lakes\Screen View\generator.scr

 SIMPLE TERRAIN INPUTS:
    SOURCE TYPE            =        POINT
    EMISSION RATE (G/S)    =     0.249476E-01
    STACK HEIGHT (M)       =       3.0480
    STK INSIDE DIAM (M)    =       0.1524
    STK EXIT VELOCITY (M/S)=      79.7640
    STK GAS EXIT TEMP (K)  =     622.0000
    AMBIENT AIR TEMP (K)   =     293.0000
    RECEPTOR HEIGHT (M)    =       0.0000
    URBAN/RURAL OPTION     =        URBAN
    BUILDING HEIGHT (M)    =       0.0000
    MIN HORIZ BLDG DIM (M) =       0.0000
    MAX HORIZ BLDG DIM (M) =       0.0000

 THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
 THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS
ENTERED.

    STACK EXIT VELOCITY WAS CALCULATED FROM
    VOLUME FLOW RATE =   1.4550126     (M**3/S)

 BUOY. FLUX =    2.402 M**4/S**3;  MOM. FLUX =   17.402 M**4/S**
2.

 *** FULL METEOROLOGY ***

 **********************************
 *** SCREEN DISCRETE DISTANCES ***
 **********************************

 *** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR
FOLLOWING DISTANCES ***

   DIST     CONC             U10M   USTK  MIX HT   PLUME   SIGMA
SIGMA
    (M)   (UG/M**3)   STAB  (M/S)  (M/S)    (M)   HT (M)   Y (M)
Z (M)  DWASH
 -------  ----------  ----  -----  -----  ------  ------  ------
------  -----
     11.  0.9935        3    10.0   10.0  3200.0    7.18    2.48
2.28    NO

  DWASH=   MEANS NO CALC MADE (CONC = 0.0)
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 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

     ***************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ***************************************

 CALCULATION        MAX CONC    DIST TO   TERRAIN
  PROCEDURE        (UG/M**3)    MAX (M)    HT (M)
--------------    -----------   -------   -------
SIMPLE TERRAIN     0.9935           11.        0.


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** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
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Operational Risk Assessment
Adult Resident Exposure Scenario - 70 Years
Diesel Emergency Generator

Source	Mass GLC	Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards/ Toxicological Endpoints													
				CPF	DOSE **	RISK	REL	ALI	BONE	CARDIO	DEV	ENDO	EYE	HEME	IMM	KID	NERV	REPRO	RESP	SKIN
	($\mu g/m^3$)			$(mg/kg/day)^{-1}$	(mg/kg/day)		($\mu g/m^3$)													
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)
Generator	9.94E-01	1.00E+00	Diesel Particulate	1.1E+00	4.1E-07	4.5E-07	5.0E+00												2.0E-01	
TOTAL						4.5E-07		0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-01	0.0E+00
BAAQMD Cancer Risk Adjustment Factor - 70-year Adult Scenari						1.7														
Adjusted Cancer Risk						7.6E-07														

* Key to Toxicological Endpoint

ALI	Alimentary
BONE	Bone
CARDIO	Cardiovascular
DEV	Developmental
ENDO	Endocrine
EYE	Eye
HEME	Hematologic
IMM	Immune
KID	Kidney
NERV	Nervous
REPRO	Reproductive
RESP	Respiratory
SKIN	Skin

** Exposure factors used to calculate dose

daily breathing rate (L/kg-day) - adult residen	302
inhalation absorption facto	1.0
exposure frequency (days/year) - resident	0.5
exposure duration (years)	70.0
averaging time (days) - 70 year duratior	25550
fraction of time at home	1.0

Map
Satellite
Hybri
1200
1200
22700
11600
1200
11600
1200
10500
100
500 ft
200 m
Imagery ©2013 - Terms o

Marin County
PM2.5 Concentrations and Cancer Risks Generated from Surface Streets

How to use the screening tables:

- Distance is from the edge of the nearest travel lane of a street to the facility or development
- When two or more streets are within the influence area, sum the contribution from each street

$PM_{2.5}$ CONCENTRATIONS (UG/M^3)

NORTH-SOUTH DIRECTIONAL ROADWAY

Annual Average Daily Traffic	Distance East or West of Surface Street - PM2.5 Concentration (ug/m^3)						
	10 feet	50 feet	100 feet	200 feet	500 feet	700 feet	1,000 feet
1,000	No analysis required						
5,000							
10,000	0.095	0.086	0.057	0.017	0.004	0.000	0.000
20,000	0.124	0.114	0.095	0.065	0.016	0.011	0.001
30,000	0.171	0.162	0.143	0.095	0.032	0.028	0.015
40,000	0.210	0.200	0.181	0.114	0.041	0.032	0.019
50,000	0.305	0.295	0.257	0.171	0.056	0.034	0.020
60,000	0.405	0.395	0.319	0.205	0.067	0.043	0.026
70,000	0.505	0.495	0.381	0.238	0.077	0.051	0.031
80,000	0.577	0.566	0.435	0.272	0.088	0.059	0.036
90,000	0.649	0.637	0.490	0.306	0.099	0.066	0.040
100,000	0.721	0.708	0.544	0.340	0.110	0.073	0.045

EAST-WEST DIRECTIONAL ROADWAY

Annual Average Daily Traffic	Distance North or South of Surface Street - PM2.5 Concentration (ug/m^3)						
	10 feet	50 feet	100 feet	200 feet	500 feet	700 feet	1,000 feet
1,000	No analysis required						
5,000							
10,000	0.095	0.083	0.063	0.020	0.005	0.000	0.000
20,000	0.162	0.143	0.095	0.035	0.014	0.010	0.002
30,000	0.171	0.162	0.143	0.086	0.032	0.022	0.016
40,000	0.314	0.286	0.229	0.105	0.048	0.031	0.023
50,000	0.572	0.476	0.381	0.124	0.062	0.041	0.030
60,000	0.605	0.524	0.429	0.171	0.070	0.049	0.037
70,000	0.638	0.572	0.476	0.219	0.079	0.056	0.044
80,000	0.729	0.653	0.544	0.250	0.090	0.064	0.050
90,000	0.821	0.735	0.612	0.282	0.102	0.072	0.056
100,000	0.912	0.817	0.680	0.313	0.113	0.080	0.063

LIFETIME CANCER RISK

NORTH-SOUTH DIRECTIONAL ROADWAY

Annual Average Daily Traffic	Distance East or West of Surface Street - Cancer Risk (per million)						
	10 feet	50 feet	100 feet	200 feet	500 feet	700 feet	1,000 feet
1,000	No analysis required						
5,000							
10,000	2.31	2.19	1.53	0.64	0.28	0.23	0.15
20,000	2.74	2.67	2.31	1.60	0.53	0.39	0.26
30,000	3.87	3.80	3.38	2.26	0.71	0.55	0.36
40,000	4.82	4.75	4.22	2.96	1.01	0.77	0.50
50,000	7.13	6.84	5.89	3.87	1.31	0.94	0.64
60,000	9.50	9.18	7.46	4.73	1.60	1.12	0.76
70,000	11.88	11.53	9.02	5.58	1.90	1.30	0.88
80,000	13.57	13.17	10.31	6.38	2.17	1.49	1.01
90,000	15.27	14.82	11.60	7.18	2.44	1.67	1.14
100,000	16.97	16.47	12.89	7.98	2.71	1.86	1.26

EAST-WEST DIRECTIONAL ROADWAY

Annual Average Daily Traffic	Distance North or South of Surface Street - Cancer Risk (per million)						
	10 feet	50 feet	100 feet	200 feet	500 feet	700 feet	1,000 feet
1,000	No analysis required						
5,000							
10,000	2.09	1.85	1.43	0.64	0.36	0.28	0.23
20,000	3.29	2.99	2.14	1.06	0.58	0.48	0.32
30,000	3.87	3.80	3.38	2.25	0.77	0.54	0.36
40,000	6.97	6.26	5.23	2.49	1.18	0.88	0.65
50,000	11.95	9.58	8.35	3.53	1.48	1.12	0.77
60,000	12.95	11.19	9.39	4.46	1.75	1.33	0.89
70,000	13.95	12.80	10.43	5.39	2.01	1.53	1.01
80,000	15.94	14.63	11.92	6.16	2.30	1.75	1.15
90,000	17.94	16.46	13.41	6.93	2.59	1.97	1.30
100,000	19.93	18.29	14.90	7.70	2.87	2.19	1.44

- Screening tables based on meteorological data collected from Mt. Tamalpais in 2005.
- The maximum acute and chronic hazard index for the distances and AADT shown in the table will be less than 0.02.
- Cancer risk were estimated based on exposure from 2014 through 2084. PM2.5 concentrations were based on emissions in 2014.