APPENDIX F

Modeling Results

Attachment 1 - Initial Dilution Calculations

Attachment 2 - Sedimentation Analysis

Attachment 3 - Analysis of Effluent Dissolve Oxygen Demand

APPENDIX F — ATTACHMENT 1

Initial Dilution Calculations

Honouliuli diffuser hydraulics, Winter, 25.91 MGD

Number of ports = 148
drho/rho = 0.0249
Number of sections = 4
bell

Mannings N = 0.0140
Desired Q = 1.1350
Calculated Q = 1.1350

Friction factor F = 0.0229
Length between ports = 3.6576
Port diameter = 0.1520

Pipe diameter = 1.2192
dz between ports = 0.0000

Port number	Specific energy (m)	Coeff cd	Pipe velocity (m/sec)	Port velocity (m/sec)	Port discharge (m^3/sec)	Port Froude #
1	0.0650	0.9749	0.0171	1.1008	0.0200	5.7161
2	0.0650	0.9747	0.0342	1.1005	0.0200	5.7147

Friction factor F = 0.0229
Length between ports = 3.6576
Port diameter = 0.0950

Pipe diameter = 1.2192
dz between ports = 0.0000

Port number	Specific energy (m)	Coeff cd	Pipe velocity (m/sec)	Port velocity (m/sec)	Port discharge (m^3/sec)	Port Froude #
3	0.0650	0.9745	0.0409	1.1004	0.0078	7.2277
4	0.0650	0.9744	0.0476	1.1002	0.0078	7.2268
5	0.0650	0.9742	0.0543	1.1001	0.0078	7.2258
6	0.0650	0.9739	0.0609	1.0999	0.0078	7.2247
7	0.0650	0.9737	0.0676	1.0997	0.0078	7.2236
8	0.0651	0.9734	0.0743	1.0996	0.0078	7.2225
9	0.0651	0.9731	0.0810	1.0994	0.0078	7.2213
10	0.0651	0.9728	0.0876	1.0992	0.0078	7.2202
11	0.0651	0.9724	0.0943	1.0991	0.0078	7.2191
12	0.0652	0.9721	0.1010	1.0989	0.0078	7.2181
13	0.0652	0.9717	0.1077	1.0987	0.0078	7.2171
14	0.0652	0.9713	0.1143	1.0986	0.0078	7.2162
15	0.0653	0.9708	0.1210	1.0985	0.0078	7.2154
16	0.0653	0.9703	0.1277	1.0984	0.0078	7.2147
17	0.0654	0.9698	0.1343	1.0983	0.0078	7.2141
18	0.0654	0.9693	0.1410	1.0982	0.0078	7.2137
19	0.0655	0.9688	0.1477	1.0982	0.0078	7.2135
20	0.0656	0.9682	0.1543	1.0982	0.0078	7.2134
21	0.0657	0.9676	0.1610	1.0982	0.0078	7.2135
22	0.0658	0.9670	0.1677	1.0983	0.0078	7.2139
23	0.0659	0.9663	0.1743	1.0984	0.0078	7.2145
24	0.0660	0.9657	0.1810	1.0985	0.0078	7.2153

25	0.0661	0.9650	0.1877	1.0987	0.0078	7.2164
26	0.0662	0.9643	0.1943	1.0989	0.0078	7.2178
27	0.0663	0.9635	0.2010	1.0991	0.0078	7.2195
28	0.0665	0.9628	0.2077	1.0994	0.0078	7.2215
29	0.0666	0.9620	0.2144	1.0998	0.0078	7.2239
30	0.0668	0.9612	0.2211	1.1002	0.0078	7.2266
31	0.0670	0.9604	0.2277	1.1007	0.0078	7.2296
32	0.0671	0.9595	0.2344	1.1012	0.0078	7.2331
33	0.0673	0.9587	0.2411	1.1018	0.0078	7.2369
34	0.0675	0.9578	0.2478	1.1024	0.0078	7.2412
35	0.0678	0.9569	0.2545	1.1031	0.0078	7.2459
36	0.0680	0.9560	0.2612	1.1039	0.0078	7.2510
37	0.0682	0.9550	0.2679	1.1048	0.0078	7.2566
38	0.0685	0.9541	0.2746	1.1057	0.0078	7.2627
39	0.0687	0.9531	0.2813	1.1067	0.0078	7.2693
40	0.0690	0.9521	0.2881	1.1078	0.0079	7.2764
41	0.0693	0.9511	0.2948	1.1089	0.0079	7.2840
42	0.0696	0.9501	0.3015	1.1102	0.0079	7.2921
43	0.0699	0.9491	0.3083	1.1115	0.0079	7.3008
44	0.0703	0.9480	0.3150	1.1129	0.0079	7.3101

Friction factor F = 0.0206
Length between ports = 3.6576
Port diameter = 0.0910

Pipe diameter = 1.6764
dz between ports = 0.0000

Port number	Specific energy (m)	Coeff cd	Pipe velocity (m/sec)	Port velocity (m/sec)	Port discharge (m^3/sec)	Port Froude #
45	0.0714	0.9674	0.1700	1.1448	0.0074	7.6827
46	0.0715	0.9671	0.1734	1.1449	0.0074	7.6839
47	0.0715	0.9668	0.1768	1.1451	0.0074	7.6852
48	0.0716	0.9665	0.1801	1.1453	0.0074	7.6865
49	0.0717	0.9662	0.1835	1.1455	0.0075	7.6880
50	0.0717	0.9659	0.1869	1.1458	0.0075	7.6896
51	0.0718	0.9655	0.1903	1.1460	0.0075	7.6913
52	0.0719	0.9652	0.1936	1.1463	0.0075	7.6931
53	0.0720	0.9649	0.1970	1.1466	0.0075	7.6950
54	0.0721	0.9645	0.2004	1.1469	0.0075	7.6970
55	0.0722	0.9642	0.2038	1.1472	0.0075	7.6991
56	0.0723	0.9638	0.2072	1.1475	0.0075	7.7014
57	0.0724	0.9635	0.2105	1.1479	0.0075	7.7038
58	0.0725	0.9631	0.2139	1.1483	0.0075	7.7063
59	0.0726	0.9627	0.2173	1.1487	0.0075	7.7089
60	0.0727	0.9624	0.2207	1.1491	0.0075	7.7117
61	0.0728	0.9620	0.2241	1.1495	0.0075	7.7146
62	0.0729	0.9616	0.2275	1.1500	0.0075	7.7176
63	0.0730	0.9612	0.2309	1.1504	0.0075	7.7208
64	0.0732	0.9608	0.2343	1.1509	0.0075	7.7241
65	0.0733	0.9605	0.2376	1.1514	0.0075	7.7276
66	0.0734	0.9601	0.2410	1.1520	0.0075	7.7312
67	0.0735	0.9597	0.2444	1.1525	0.0075	7.7349
68	0.0737	0.9592	0.2478	1.1531	0.0075	7.7388
69	0.0738	0.9588	0.2512	1.1537	0.0075	7.7429
70	0.0740	0.9584	0.2546	1.1543	0.0075	7.7471
71	0.0741	0.9580	0.2580	1.1550	0.0075	7.7515
72	0.0743	0.9576	0.2614	1.1557	0.0075	7.7560
73	0.0744	0.9572	0.2649	1.1564	0.0075	7.7607
74	0.0746	0.9567	0.2683	1.1571	0.0075	7.7656
75	0.0747	0.9563	0.2717	1.1579	0.0075	7.7707
76	0.0749	0.9559	0.2751	1.1586	0.0075	7.7759
77	0.0751	0.9554	0.2785	1.1594	0.0075	7.7813
78	0.0753	0.9550	0.2819	1.1603	0.0075	7.7868
79	0.0754	0.9545	0.2853	1.1611	0.0076	7.7926
80	0.0756	0.9541	0.2888	1.1620	0.0076	7.7985
81	0.0758	0.9536	0.2922	1.1629	0.0076	7.8046
82	0.0760	0.9532	0.2956	1.1638	0.0076	7.8109
83	0.0762	0.9527	0.2991	1.1648	0.0076	7.8174
84	0.0764	0.9522	0.3025	1.1658	0.0076	7.8240
85	0.0766	0.9518	0.3059	1.1668	0.0076	7.8309
86	0.0768	0.9513	0.3094	1.1679	0.0076	7.8380
87	0.0771	0.9508	0.3128	1.1690	0.0076	7.8452
88	0.0773	0.9504	0.3163	1.1701	0.0076	7.8527
89	0.0775	0.9499	0.3197	1.1712	0.0076	7.8604
90	0.0777	0.9494	0.3232	1.1724	0.0076	7.8682
91	0.0780	0.9489	0.3266	1.1736	0.0076	7.8763
92	0.0782	0.9484	0.3301	1.1748	0.0076	7.8846
93	0.0785	0.9480	0.3336	1.1761	0.0076	7.8931
94	0.0787	0.9475	0.3370	1.1774	0.0077	7.9018

Friction factor F = 0.0194
Length between ports = 3.6576
Port diameter = 0.0870

dz between ports = 0.0000

Port number	Specific energy (m)	Coeff cd	Pipe velocity (m/sec)	Port velocity (m/sec)	Port discharge (m^3/sec)	Port Froude #
95	0.0793	0.9609	0.2436	1.1985	0.0071	8.2264
96	0.0794	0.9606	0.2459	1.1990	0.0071	8.2298
97	0.0795	0.9604	0.2482	1.1995	0.0071	8.2334
98	0.0797	0.9601	0.2506	1.2001	0.0071	8.2370
99	0.0798	0.9599	0.2529	1.2006	0.0071	8.2407
100	0.0799	0.9596	0.2552	1.2012	0.0071	8.2446
101	0.0800	0.9593	0.2575	1.2017	0.0071	8.2485
102	0.0801	0.9591	0.2598	1.2023	0.0071	8.2524
103	0.0802	0.9588	0.2621	1.2029	0.0072	8.2565
104	0.0804	0.9585	0.2645	1.2035	0.0072	8.2607
105	0.0805	0.9583	0.2668	1.2041	0.0072	8.2650
106	0.0806	0.9580	0.2691	1.2048	0.0072	8.2693
107	0.0808	0.9577	0.2714	1.2054	0.0072	8.2738
108	0.0809	0.9575	0.2738	1.2061	0.0072	8.2783
109	0.0810	0.9572	0.2761	1.2068	0.0072	8.2830
110	0.0812	0.9569	0.2784	1.2075	0.0072	8.2877
111	0.0813	0.9566	0.2807	1.2082	0.0072	8.2926
112	0.0815	0.9564	0.2831	1.2089	0.0072	8.2975
113	0.0816	0.9561	0.2854	1.2096	0.0072	8.3026
114	0.0818	0.9558	0.2877	1.2104	0.0072	8.3077
115	0.0819	0.9555	0.2901	1.2111	0.0072	8.3130
116	0.0821	0.9552	0.2924	1.2119	0.0072	8.3183
117	0.0822	0.9550	0.2947	1.2127	0.0072	8.3238
118	0.0824	0.9547	0.2971	1.2135	0.0072	8.3293
119	0.0825	0.9544	0.2994	1.2143	0.0072	8.3350
120	0.0827	0.9541	0.3018	1.2152	0.0072	8.3407
121	0.0829	0.9538	0.3041	1.2160	0.0072	8.3466
122	0.0830	0.9535	0.3065	1.2169	0.0072	8.3526
123	0.0832	0.9532	0.3088	1.2178	0.0072	8.3587
124	0.0834	0.9529	0.3112	1.2187	0.0072	8.3649
125	0.0836	0.9526	0.3135	1.2196	0.0073	8.3712
126	0.0837	0.9524	0.3159	1.2205	0.0073	8.3776
127	0.0839	0.9521	0.3182	1.2215	0.0073	8.3841
128	0.0841	0.9518	0.3206	1.2225	0.0073	8.3908
129	0.0843	0.9515	0.3229	1.2235	0.0073	8.3975
130	0.0845	0.9512	0.3253	1.2245	0.0073	8.4044
131	0.0847	0.9509	0.3277	1.2255	0.0073	8.4114
132	0.0849	0.9506	0.3300	1.2265	0.0073	8.4185
133	0.0851	0.9503	0.3324	1.2276	0.0073	8.4257
134	0.0853	0.9500	0.3348	1.2286	0.0073	8.4331
135	0.0855	0.9497	0.3371	1.2297	0.0073	8.4405
136	0.0857	0.9494	0.3395	1.2308	0.0073	8.4481
137	0.0859	0.9491	0.3419	1.2319	0.0073	8.4558
138	0.0861	0.9488	0.3443	1.2331	0.0073	8.4636

139	0.0863	0.9485	0.3466	1.2342	0.0073	8.4715
140	0.0866	0.9482	0.3490	1.2354	0.0073	8.4796
141	0.0868	0.9478	0.3514	1.2366	0.0074	8.4877
142	0.0870	0.9475	0.3538	1.2378	0.0074	8.4961
143	0.0872	0.9472	0.3562	1.2390	0.0074	8.5045
144	0.0875	0.9469	0.3586	1.2403	0.0074	8.5130
145	0.0877	0.9466	0.3610	1.2415	0.0074	8.5217
146	0.0879	0.9463	0.3634	1.2428	0.0074	8.5305
147	0.0882	0.9460	0.3658	1.2441	0.0074	8.5394
148	0.0884	0.9457	0.3682	1.2454	0.0074	8.5485

```
Jul 31, 1995,   9:34:58  ERL-N PROGRAM PLUMES, Ed 3, 3/11/94  Case:   1 of  16
Title   Honouliuli, 1/10/94 CTD, Station HZ, March 1994 Flows          nonlinear
 tot flow   # ports port flow   spacing  effl sal effl temp   far inc   far dis
    2.073       146   0.01420     3.658   0.67884      24.8       500      2500
 port dep  port dia plume dia total vel horiz vel vertl vel asp coeff print frq
    60.96   0.09093   0.08881     2.292     2.292     0.000      0.10       500
port elev ver angle cont coef  effl den poll conc     decay  Froude # Roberts F
   0.8382       0.0     0.954  -2.33000    2.46e6     55.26     15.04    0.1551
hor angle red space p amb den p current   far dif   far vel K:vel/cur Stratif #
       90     3.658   24.2849   0.05400    0.0003     0.054     42.440.00003530
    depth   current   density  salinity      temp  amb conc  N (freq) red grav.
      0.0      1e-5   23.6400   35.0091   24.1078         0   0.01006    0.2616
        7      1e-5   23.6647    35.037   24.0957         0 buoy flux puff-ther
       14     0.024   23.7158   35.0588   23.9788         0  0.001015     1.741
       21     0.024   23.7769   35.0709   23.8027         0 jet-plume jet-cross
       28     0.024   23.8424   35.0594   23.5497         0     1.257     3.341
       35     0.054   23.8899   35.0546   23.3743         0 plu-cross jet-strat
       42     0.054   23.8776   35.0135   23.3096         0     23.59     4.234
       49     0.054   23.9741   35.0858   23.1654         0 plu-strat
       54     0.054   24.0477   35.0867   22.9126         0     7.769
    60.96     0.054   24.2849   35.0789    22.056         0   hor dis>=

CORMIX1 flow category algorithm is turned off.
 146  L ¼ 534 m                                                  1 to any  range
Help: F1.  Quit: <esc>.  Configuration:ATNO0.  FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)
 plume dep plume dia poll conc  dilution   hor dis
         m         m                           m
    60.96   0.08881   2460000     1.000     0.000

    58.68     1.712     75970     31.19     4.432
    54.53     3.693     23070     100.6     7.390 -> merging
    48.44     9.897      9402     236.0     12.12 -> trap level
    45.18     20.54      5830     365.2     16.08 -> begin overlap
FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of      551.0m
   --4/3 Power Law--   -Const Eddy Diff-
      conc  dilution      conc  dilution  distance        Time
                                               m        sec   hrs
    16.52     419.1     17.48     395.7     500.0       8961   2.5
  0.03299     565.7   0.03997     465.2      1000      18220   5.1
0.00006794    739.00.00009402     531.4      1500      27480   7.6
 1.451E-07    929.9 2.267E-07     591.6      2000      36740  10.2
 3.189E-10   1135.8 5.564E-10     646.7      2500      46000  12.8
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Jul 31, 1995, 9:35:11 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 2 of 16
Title Honouliuli, 1/10/94 CTD, Station HZ, March 2000 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
2.242	146	0.01536	3.658	0.67884	24.8	500	2500

port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.479	2.479	0.000	0.10	500

port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.33000	2.46e6	55.26	16.26	0.1434

hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	24.2849	0.05400	0.0003	0.054	45.900	.00003530

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.6400	35.0091	24.1078	0	0.01006	0.2616
7	1e-5	23.6647	35.037	24.0957	0	buoy flux	puff-ther
14	0.024	23.7158	35.0588	23.9788	0	0.001098	1.883
21	0.024	23.7769	35.0709	23.8027	0	jet-plume	jet-cross
28	0.024	23.8424	35.0594	23.5497	0	1.360	3.613
35	0.054	23.8899	35.0546	23.3743	0	plu-cross	jet-strat
42	0.054	23.8776	35.0135	23.3096	0	25.51	4.403
49	0.054	23.9741	35.0858	23.1654	0	plu-strat	
54	0.054	24.0477	35.0867	22.9126	0	7.923	
60.96	0.054	24.2849	35.0789	22.056	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep m	plume dia m	poll conc	dilution	hor dis m	
60.96	0.08881	2460000	1.000	0.000	
58.72	1.762	75970	31.19	4.622	
54.62	3.681	24230	95.84	7.621	-> merging
48.15	10.04	9729	227.9	12.58	-> trap level
44.76	20.88	6075	350.3	16.60	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 551.3m

--4/3 Power Law--		-Const Eddy Diff-			Time	
conc	dilution	conc	dilution	distance m	sec	hrs
17.33	401.9	18.33	379.5	500.0	8952	2.5
0.03461	542.3	0.04192	446.2	1000	18210	5.1
0.00007127	708.5	0.00009861	509.6	1500	27470	7.6
1.522E-07	891.6	2.378E-07	567.3	2000	36730	10.2
3.345E-10	1088.9	5.836E-10	620.2	2500	45990	12.8

Jul 31, 1995, 9:35:21 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 3 of 16
Title Honouliuli, 1/10/94 CTD, Station HZ, March 2005 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
2.528	146	0.01732	3.658	0.67884	24.8	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.795	2.795	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.33000	2.46e6	55.26	18.34	0.1272
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	24.2849	0.05400	0.0003	0.054	51.760	.00003530

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.6400	35.0091	24.1078	0	0.01006	0.2616
7	1e-5	23.6647	35.037	24.0957	0	buoy flux	puff-ther
14	0.024	23.7158	35.0588	23.9788	0	0.001238	2.123
21	0.024	23.7769	35.0709	23.8027	0	jet-plume	jet-cross
28	0.024	23.8424	35.0594	23.5497	0	1.533	4.074
35	0.054	23.8899	35.0546	23.3743	0	plu-cross	jet-strat
42	0.054	23.8776	35.0135	23.3096	0	28.77	4.675
49	0.054	23.9741	35.0858	23.1654	0	plu-strat	
54	0.054	24.0477	35.0867	22.9126	0	8.165	
60.96	0.054	24.2849	35.0789	22.056	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep m	plume dia m	poll conc	dilution	hor dis m	
60.96	0.08881	2460000	1.000	0.000	
58.80	1.842	75970	31.19	4.914	
54.78	3.676	25990	89.42	7.999	-> merging
47.75	10.21	10280	215.6	13.32	-> trap level
44.16	21.15	6512	326.8	17.41	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 551.6m

--4/3 Power Law--		-Const Eddy Diff-		distance	Time	
conc	dilution	conc	dilution	m	sec	hrs
18.76	374.8	19.84	354.0	500.0	8937	2.5
0.03748	505.7	0.04538	416.2	1000	18200	5.1
0.00007717	660.7	0.0001067	475.3	1500	27460	7.6
1.648E-07	831.3	2.574E-07	[illegible]2	2000	36710	10.2
3.622E-10	1015.4	6.317E-10	5[illegible]5	2500	45970	12.8

Jul 31, 1995, 9:35:43 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 4 of 16
Title Honouliuli, 1/10/94 CTD, Station HZ, March 2010 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
2.675	146	0.01832	3.658	0.67884	24.8	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.957	2.957	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.33000	2.46e6	55.26	19.40	0.1202
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	24.2849	0.05400	0.0003	0.054	54.770	0.00003530

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.6400	35.0091	24.1078	0	0.01006	0.2616
7	1e-5	23.6647	35.037	24.0957	0	buoy flux	puff-ther
14	0.024	23.7158	35.0588	23.9788	0	0.001310	2.247
21	0.024	23.7769	35.0709	23.8027	0	jet-plume	jet-cross
28	0.024	23.8424	35.0594	23.5497	0	1.622	4.311
35	0.054	23.8899	35.0546	23.3743	0	plu-cross	jet-strat
42	0.054	23.8776	35.0135	23.3096	0	30.44	4.809
49	0.054	23.9741	35.0858	23.1654	0	plu-strat	
54	0.054	24.0477	35.0867	22.9126	0	8.281	
60.96	0.054	24.2849	35.0789	22.056	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep	plume dia	poll conc	dilution	hor dis	
m	m			m	
60.96	0.08881	2460000	1.000	0.000	
58.84	1.880	75970	31.19	5.049	
54.85	3.687	26730	86.98	8.196	-> merging
47.58	10.27	10570	209.7	13.68	-> trap level
43.85	21.44	6691	317.9	17.87	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 551.9m

--4/3 Power Law--		-Const Eddy Diff-			Time	
conc	dilution	conc	dilution	distance	sec	hrs
				m		
19.39	364.4	20.50	344.2	500.0	8928	2.5
0.03874	491.6	0.04690	404.7	1000	18190	5.1
0.00007978	642.3	0.0001103	462.2	1500	27450	7.6
1.703E-07	808.2	2.660E-07	514.6	2000	36710	10.2
3.744E-10	987.1	6.528E-10	562.6	2500	45970	12.8

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Jul 31, 1995,   9:36: 8  ERL-N PROGRAM PLUMES, Ed 3, 3/11/94  Case:   6 of  16
Title   Honouliuli, 4/14/94 CTD, Station HZ, June 2000 Flows          nonlinear
 tot flow   # ports port flow   spacing  effl sal effl temp   far inc   far dis
    1.671       146   0.01145     3.658    0.6863      24.9       500      2500
 port dep  port dia plume dia total vel horiz vel vertl vel asp coeff print frq
    60.96   0.09093   0.08881     1.847     1.847     0.000      0.10       500
port elev ver angle cont coef  effl den poll conc     decay  Froude # Roberts F
   0.8382       0.0     0.954  -2.35000    2.46e6     55.26     12.35   0.08113
hor angle red space p amb den p current   far dif   far vel K:vel/cur Stratif #
       90     3.658   23.2986   0.04000    0.0003      0.06     46.19 4.099E-07
    depth   current   density  salinity      temp  amb conc  N (freq) red grav.
      0.0      1e-5   23.2913   34.4956   23.9748         0  0.001065    0.2521
        7      1e-5   23.3132   34.5285    23.985         0 buoy flux puff-ther
       14      0.06   23.3263   34.5446   23.9819         0 0.0007889     1.570
       21      0.06   23.3304   34.5503   23.9825         0 jet-plume jet-cross
       28      0.06   23.3331   34.5566   23.9893         0     1.032     3.635
       35     0.027   23.3332   34.5579   23.9926         0 plu-cross jet-strat
       42     0.027   23.3346   34.5611    23.996         0     45.09     11.68
       49      0.04   23.3344   34.5609   23.9962         0 plu-strat
       54      0.04   23.3407   34.5667   23.9897         0     39.31
    60.96      0.04   23.2986   34.4991   23.9593         0   hor dis>=

CORMIX1 flow category algorithm is turned off.
 146  L ¼ 534 m                                                 1 to any  range
Help: F1.  Quit: <esc>.  Configuration:ATNO0.  FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)
 plume dep plume dia poll conc  dilution   hor dis
         m         m                           m
    60.96   0.08881   2460000     1.000     0.000

    58.26     1.571     75890     31.22     3.966
    52.20     3.676     18200     126.6     6.875 -> merging
    9.115     27.77      1821     998.3     23.56
    5.963     28.62      1736      1026     25.05 -> surface hit
FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of      559.0m
   --4/3 Power Law--   -Const Eddy Diff-
      conc  dilution      conc  dilution  distance         Time
                                               m        sec   hrs
    9.929    1138.1     10.35    1090.4     500.0       7916   2.2
  0.03703    1486.4   0.04346    1262.7      1000      16250   4.5
0.0001404    1906.0 0.0001860    1432.5      1500      24580   6.8
5.491E-07    2368.1 8.140E-07    [illegible]8.9      2000      32920   9.1
2.202E-09    2865.8 3.620E-09    [illegible]3.0      2500      41250  11.5
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Jul 31, 1995,   9:35:56  ERL-N PROGRAM PLUMES, Ed 3, 3/11/94  Case:   5 of  16
Title   Honouliuli, 4/14/94 CTD, Station HZ, June 1994 Flows          nonlinear
 tot flow   # ports port flow   spacing  effl sal effl temp   far inc   far dis
    1.545       146   0.01058     3.658    0.6863      24.9       500      2500
 port dep  port dia plume dia total vel horiz vel vertl vel asp coeff print frq
    60.96   0.09093   0.08881     1.708     1.708     0.000      0.10       500
port elev ver angle cont coef  effl den poll conc     decay  Froude # Roberts F
   0.8382       0.0     0.954  -2.35000    2.46e6     55.26     11.41   0.08775
hor angle red space p amb den p current   far dif   far vel K:vel/cur Stratif #
       90     3.658   23.2986   0.04000    0.0003      0.06     42.70 4.099E-07
    depth   current   density  salinity      temp  amb conc  N (freq) red grav.
      0.0      1e-5   23.2913   34.4956   23.9748         0  0.001065    0.2521
        7      1e-5   23.3132   34.5285    23.985         0 buoy flux puff-ther
       14      0.06   23.3263   34.5446   23.9819         0 0.0007294     1.452
       21      0.06   23.3304   34.5503   23.9825         0 jet-plume jet-cross
       28      0.06   23.3331   34.5566   23.9893         0    0.9544     3.361
       35     0.027   23.3332   34.5579   23.9926         0 plu-cross jet-strat
       42     0.027   23.3346   34.5611    23.996         0     41.69     11.23
       49      0.04   23.3344   34.5609   23.9962         0 plu-strat
       54      0.04   23.3407   34.5667   23.9897         0     38.55
    60.96      0.04   23.2986   34.4991   23.9593         0   hor dis>=

CORMIX1 flow category algorithm is turned off.
 146  L ¼ 534 m                                                 1 to any  range
Help: F1.  Quit: <esc>.  Configuration:ATNO0.  FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)
 plume dep plume dia poll conc  dilution   hor dis
         m         m                           m
    60.96   0.08881   2460000     1.000     0.000

    58.25     1.523     75900     31.22     3.781
    52.14     3.677     17330     132.8     6.652 -> merging
    13.19     26.31      1853     998.3     21.69
    6.432     29.47      1608      1100     25.07 -> surface hit
FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of      559.9m
   --4/3 Power Law--    -Const Eddy Diff-
      conc  dilution      conc  dilution  distance        Time
                                               m         sec   hrs
     9.202    1219.5     9.594    1168.5     500.0       7915   2.2
   0.03433    1592.2   0.04027    1352.9      1000      16250   4.5
 0.0001302    2041.4 0.0001724    1534.8      1500      24580   6.8
 5.092E-07    2536.0 7.545E-07    1702.3      2000      32920   9.1
 2.042E-09    3068.7 3.356E-09    1856.6      2500      41250  11.5
```

Jul 31, 1995, 9:36:20 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 7 of 16
Title Honouliuli, 4/14/94 CTD, Station HZ, June 2005 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
1.884	146	0.01290	3.658	0.6863	24.9	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.083	2.083	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.35000	2.46e6	55.26	13.92	0.07196
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	23.2986	0.04000	0.0003	0.06	52.07	4.099E-07

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.2913	34.4956	23.9748	0	0.001065	0.2521
7	1e-5	23.3132	34.5285	23.985	0	buoy flux	puff-ther
14	0.06	23.3263	34.5446	23.9819	0	0.0008894	1.771
21	0.06	23.3304	34.5503	23.9825	0	jet-plume	jet-cross
28	0.06	23.3331	34.5566	23.9893	0	1.164	4.099
35	0.027	23.3332	34.5579	23.9926	0	plu-cross	jet-strat
42	0.027	23.3346	34.5611	23.996	0	50.84	12.41
49	0.04	23.3344	34.5609	23.9962	0	plu-strat	
54	0.04	23.3407	34.5667	23.9897	0	40.51	
60.96	0.04	23.2986	34.4991	23.9593	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep	plume dia	poll conc	dilution	hor dis	
m	m			m	
60.96	0.08881	2460000	1.000	0.000	
58.31	1.647	75880	31.22	4.256	
52.30	3.687	19530	118.1	7.249	-> merging
5.380	27.42	1948	925.0	25.05	-> surface hit

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 557.8m

--4/3 Power Law--		-Const Eddy Diff-			Time	
conc	dilution	conc	dilution	distance		
				m	sec	hrs
11.14	1026.1	11.62	983.0	500.0	7916	2.2
0.04152	1340.6	0.04875	1138.4	1000	16250	4.5
0.0001574	1719.5	0.0002086	1291.7	1500	24580	6.8
6.155E-07	2136.7	9.129E-07	1432.8	2000	32920	9.1
2.468E-09	2586.1	4.061E-09	[illegible].8	2500	41250	11.5

Jul 31, 1995, 9:36:35 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 8 of 16
Title Honouliuli, 4/14/94 CTD, Station HZ, June 2010 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
1.994	146	0.01366	3.658	0.6863	24.9	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.205	2.205	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.35000	2.46e6	55.26	14.73	0.06799
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	23.2986	0.04000	0.0003	0.06	55.11	4.099E-07

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.2913	34.4956	23.9748	0	0.001065	0.2521
7	1e-5	23.3132	34.5285	23.985	0	buoy flux	puff-ther
14	0.06	23.3263	34.5446	23.9819	0	0.0009413	1.874
21	0.06	23.3304	34.5503	23.9825	0	jet-plume	jet-cross
28	0.06	23.3331	34.5566	23.9893	0	1.232	4.338
35	0.027	23.3332	34.5579	23.9926	0	plu-cross	jet-strat
42	0.027	23.3346	34.5611	23.996	0	53.80	12.76
49	0.04	23.3344	34.5609	23.9962	0	plu-strat	
54	0.04	23.3407	34.5667	23.9897	0	41.09	
60.96	0.04	23.2986	34.4991	23.9593	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep	plume dia	poll conc	dilution	hor dis	
m	m			m	
60.96	0.08881	2460000	1.000	0.000	
58.33	1.684	75880	31.22	4.395	
52.38	3.688	20230	114.1	7.429	-> merging
5.178	26.89	2056	881.2	25.06	-> surface hit

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 557.3m

--4/3 Power Law--		-Const Eddy Diff-			Time	
conc	dilution	conc	dilution	distance		
				m	sec	hrs
11.76	977.6	12.26	936.5	500.0	7916	2.2
0.04382	1277.5	0.05145	1084.7	1000	16250	4.5
0.0001661	1638.8	0.0002202	1230.8	1500	24580	6.8
6.494E-07	2036.6	9.635E-07	1365.2	2000	32920	9.1
2.604E-09	2465.0	4.286E-09	1489.1	2500	41250	11.5

Jul 31, 1995, 9:36:46 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 9 of 16
Title Honouliuli, 7/02/93 CTD, Station HZ, July 1994 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
1.662	146	0.01138	3.658	0.69084	25.3	500	2500

port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	1.837	1.837	0.000	0.10	500

port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.45000	2.46e6	55.26	12.07	0.01925

hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	24.0830	0.02500	0.0003	0.025	73.500	.00007121

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	22.7861	34.634	25.9861	0	0.01427	0.2608
7	1e-5	22.8567	34.728	25.9868	0	buoy flux	puff-ther
14	0.016	22.8595	34.729	25.9802	0	0.0008117	1.806
21	0.016	23.0968	34.819	25.4319	0	jet-plume	jet-cross
28	0.016	23.8597	35.002	23.3412	0	1.009	5.785
35	0.025	23.9945	35.035	22.9614	0	plu-cross	jet-strat
42	0.025	24.0667	35.061	22.7784	0	190.0	3.183
49	0.025	24.0558	34.988	22.6229	0	plu-strat	
54	0.025	24.0656	34.991	22.5964	0	5.653	
60.96	0.025	24.0830	35.008	22.5806	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep m	plume dia m	poll conc	dilution	hor dis m	
60.96	0.08881	2460000	1.000	0.000	
57.86	1.543	75830	31.20	3.847	
49.98	3.678	17350	131.8	6.500	-> merging
33.95	9.169	5993	352.7	10.54	-> trap level
27.74	20.27	4654	434.2	12.57	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 550.7m

--4/3 Power Law--		-Const Eddy Diff-				
conc	dilution	conc	dilution	distance m	Time sec	hrs
0.01120	699.7	0.01383	564.5	500.0	19500	5.4
1.865E-08	1177.3	3.017E-08	723.6	1000	39500	11.0
3.532E-14	1736.4	7.116E-14	856.0	1500	59500	16.5
7.233E-20	2364.4	1.749E-19	[illegible].2	2000	79500	22.1
1.561E-25	3053.0	4.406E-25	[illegible].3	2500	99500	27.6

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Jul 31, 1995,   9:36:56  ERL-N PROGRAM PLUMES, Ed 3, 3/11/94  Case:  10 of  16
Title   Honouliuli, 7/02/93 CTD, Station HZ, July 2000 Flows          nonlinear
 tot flow   # ports port flow   spacing  effl sal effl temp   far inc   far dis
    1.797       146   0.01231     3.658   0.69084      25.3       500      2500
 port dep  port dia plume dia total vel horiz vel vertl vel asp coeff print frq
    60.96   0.09093   0.08881     1.987     1.987     0.000      0.10       500
port elev ver angle cont coef  effl den poll conc     decay  Froude # Roberts F
   0.8382       0.0     0.954  -2.45000    2.46e6     55.26     13.05   0.01780
hor angle red space p amb den p current   far dif   far vel K:vel/cur Stratif #
       90     3.658   24.0830   0.02500    0.0003     0.025     79.470.00007121
    depth   current   density  salinity      temp  amb conc  N (freq) red grav.
      0.0      1e-5   22.7861    34.634   25.9861         0   0.01427    0.2608
        7      1e-5   22.8567    34.728   25.9868         0 buoy flux puff-ther
       14     0.016   22.8595    34.729   25.9802         0 0.0008777     1.953
       21     0.016   23.0968    34.819   25.4319         0 jet-plume jet-cross
       28     0.016   23.8597    35.002   23.3412         0     1.091     6.255
       35     0.025   23.9945    35.035   22.9614         0 plu-cross jet-strat
       42     0.025   24.0667    35.061   22.7784         0     205.5     3.310
       49     0.025   24.0558    34.988   22.6229         0 plu-strat
       54     0.025   24.0656    34.991   22.5964         0     5.764
    60.96     0.025   24.0830    35.008   22.5806         0   hor dis>=

CORMIX1 flow category algorithm is turned off.
 146  L ¼ 534 m                                                  1 to any  range
Help: F1.  Quit: <esc>.  Configuration:ATNO0.  FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)
 plume dep plume dia poll conc  dilution   hor dis
        m         m                             m
    60.96   0.08881   2460000     1.000     0.000

    57.90     1.594     75830     31.20     4.036
    50.14     3.680     18230     125.6     6.752 -> merging
    33.66     9.238      6255     338.3     10.91 -> trap level
    27.39     20.17      4896     413.6     12.94 -> begin overlap
FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of      550.6m
   --4/3 Power Law--   -Const Eddy Diff-
      conc  dilution      conc  dilution  distance         Time
                                                m        sec   hrs
   0.01190     666.3   0.01468     537.7     500.0     19480   5.4
 1.981E-08    1121.3 3.203E-08     689.2      1000     39480  11.0
 3.751E-14    1653.9 7.556E-14     815.4      1500     59480  16.5
 7.681E-20    2252.3 1.857E-19     925.2      2000     79480  22.1
 1.658E-25    2908.4 4.678E-25    1023.4      2500     99480  27.6
```

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Title Honouliuli, 7/02/93 CTD, Station HZ, July 2005 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
2.027	146	0.01388	3.658	0.69084	25.3	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.241	2.241	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.45000	2.46e6	55.26	14.72	0.01578
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	24.0830	0.02500	0.0003	0.025	89.640	0.00007121

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	22.7861	34.634	25.9861	0	0.01427	0.2608
7	1e-5	22.8567	34.728	25.9868	0	buoy flux	puff-ther
14	0.016	22.8595	34.729	25.9802	0	0.0009900	2.203
21	0.016	23.0968	34.819	25.4319	0	jet-plume	jet-cross
28	0.016	23.8597	35.002	23.3412	0	1.231	7.056
35	0.025	23.9945	35.035	22.9614	0	plu-cross	jet-strat
42	0.025	24.0667	35.061	22.7784	0	231.8	3.515
49	0.025	24.0558	34.988	22.6229	0	plu-strat	
54	0.025	24.0656	34.991	22.5964	0	5.941	
60.96	0.025	24.0830	35.008	22.5806	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep	plume dia	poll conc	dilution	hor dis	
m	m			m	
60.96	0.08881	2460000	1.000	0.000	
57.99	1.678	75830	31.20	4.333	
50.43	3.682	19710	116.4	7.158	-> merging
33.39	9.248	6722	315.7	11.49	-> trap level
26.97	19.60	5307	383.3	13.50	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 550.0m

--4/3 Power Law--		-Const Eddy Diff-			Time	
conc	dilution	conc	dilution	distance	sec	hrs
				m		
0.01309	617.2	0.01615	498.2	500.0	19460	5.4
2.179E-08	1039.1	3.523E-08	638.7	1000	39460	11.0
4.124E-14	1533.0	8.310E-14	755.7	1500	59460	16.5
8.444E-20	2087.9	2.042E-19	857.4	2000	79460	22.1
1.822E-25	2696.4	5.145E-25	948.5	2500	99460	27.6

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Title Honouliuli, 7/02/93 CTD, Station HZ, July 2010 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
2.144	146	0.01468	3.658	0.69084	25.3	500	2500
port dep	**port dia**	**plume dia**	**total vel**	**horiz vel**	**vertl vel**	**asp coeff**	**print frq**
60.96	0.09093	0.08881	2.370	2.370	0.000	0.10	500
port elev	**ver angle**	**cont coef**	**effl den**	**poll conc**	**decay**	**Froude #**	**Roberts F**
0.8382	0.0	0.954	-2.45000	2.46e6	55.26	15.57	0.01492
hor angle	**red space**	**p amb den**	**p current**	**far dif**	**far vel**	**K:vel/cur**	**Stratif #**
90	3.658	24.0830	0.02500	0.0003	0.025	94.820	.00007121

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	22.7861	34.634	25.9861	0	0.01427	0.2608
7	1e-5	22.8567	34.728	25.9868	0	buoy flux	puff-ther
14	0.016	22.8595	34.729	25.9802	0	0.001047	2.330
21	0.016	23.0968	34.819	25.4319	0	jet-plume	jet-cross
28	0.016	23.8597	35.002	23.3412	0	1.302	7.463
35	0.025	23.9945	35.035	22.9614	0	plu-cross	jet-strat
42	0.025	24.0667	35.061	22.7784	0	245.2	3.615
49	0.025	24.0558	34.988	22.6229	0	plu-strat	
54	0.025	24.0656	34.991	22.5964	0	6.025	
60.96	0.025	24.0830	35.008	22.5806	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep	plume dia	poll conc	dilution	hor dis	
m	m			m	
60.96	0.08881	2460000	1.000	0.000	
58.03	1.718	75830	31.20	4.473	
50.58	3.686	20420	112.4	7.357	-> merging
33.15	9.325	6915	307.0	11.81	-> trap level
26.80	19.37	5506	370.2	13.79	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 549.8m

--4/3 Power Law--		-Const Eddy Diff-				
conc	dilution	conc	dilution	distance	Time	
				m	sec	hrs
0.01368	596.1	0.01688	481.2	500.0	19450	5.4
2.277E-08	1003.7	3.682E-08	616.9	1000	39450	11.0
4.309E-14	1480.9	8.684E-14	730.0	1500	59450	16.5
8.824E-20	2017.1	2.134E-19	828.2	2000	79450	22.1
1.904E-25	2605.0	5.376E-25	916.2	2500	99450	27.6

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Title Honouliuli, 12/02/93 CTD, Station HZ, October 2010 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
2.189	146	0.01499	3.658	0.67935	26.1	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.420	2.420	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.67000	2.46e6	55.26	15.98	0.01477
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	23.5796	0.02500	0.0003	0.025	96.810	0.00001870

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.2428	34.814	24.941	0	0.007276	0.2581
7	1e-5	23.3360	34.906	24.8624	0	buoy flux	puff-ther
14	0.016	23.3631	34.904	24.7677	0	0.001058	2.387
21	0.016	23.4248	34.878	24.4973	0	jet-plume	jet-cross
28	0.016	23.4304	34.916	24.5744	0	1.336	7.620
35	0.016	23.4461	34.941	24.5848	0	plu-cross	jet-strat
42	0.025	23.4711	34.95	24.5243	0	247.7	5.117
49	0.025	23.4856	34.952	24.481	0	plu-strat	
54	0.025	23.5211	34.948	24.352	0	10.01	
60.96	0.025	23.5796	34.95	24.1607	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep	plume dia	poll conc	dilution	hor dis	
m	m			m	
60.96	0.08881	2460000	1.000	0.000	
58.06	1.740	75830	31.20	4.543	
50.88	3.683	21300	107.8	7.434	-> merging
19.19	14.21	4935	396.9	15.73	-> trap level
9.331	31.26	3834	472.0	18.96	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 561.7m

--4/3 Power Law--		-Const Eddy Diff-			Time	
conc	dilution	conc	dilution	distance	sec	hrs
				m		
0.01103	748.9	0.01352	608.9	500.0	19240	5.3
1.840E-08	1258.1	2.948E-08	780.6	1000	39240	10.9
3.486E-14	1854.4	6.953E-14	923.7	1500	59240	16.5
7.143E-20	2524.1	1.708E-19	[illegible]8.1	2000	79240	22.0
1.542E-25	3258.5	4.304E-25	[illegible]9.5	2500	99240	27.6

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Title Honouliuli, 12/02/93 CTD, Station HZ, October 1994 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
1.697	146	0.01162	3.658	0.67935	26.1	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	1.876	1.876	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.67000	2.46e6	55.26	12.39	0.01905
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	23.5796	0.02500	0.0003	0.025	75.050	0.00001870

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.2428	34.814	24.941	0	0.007276	0.2581
7	1e-5	23.3360	34.906	24.8624	0	buoy flux	puff-ther
14	0.016	23.3631	34.904	24.7677	0	0.0008202	1.851
21	0.016	23.4248	34.878	24.4973	0	jet-plume	jet-cross
28	0.016	23.4304	34.916	24.5744	0	1.036	5.907
35	0.016	23.4461	34.941	24.5848	0	plu-cross	jet-strat
42	0.025	23.4711	34.95	24.5243	0	192.0	4.505
49	0.025	23.4856	34.952	24.481	0	plu-strat	
54	0.025	23.5211	34.948	24.352	0	9.394	
60.96	0.025	23.5796	34.95	24.1607	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep	plume dia	poll conc	dilution	hor dis	
m	m			m	
60.96	0.08881	2460000	1.000	0.000	
57.88	1.562	75820	31.20	3.914	
50.24	3.684	18100	126.5	6.576	-> merging
19.84	15.02	4163	462.3	14.68	-> trap level
12.56	30.18	3328	542.2	17.16	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 560.6m

--4/3 Power Law--		-Const Eddy Diff-			Time	
conc	dilution	conc	dilution	distance		
				m	sec	hrs
0.009118	862.8	0.01119	700.4	500.0	19310	5.4
1.521E-08	1449.1	2.441E-08	897.7	1000	39310	10.9
2.883E-14	2135.5	5.758E-14	1062.1	1500	59310	16.5
5.907E-20	2906.4	1.415E-19	1205.1	2000	79310	22.0
1.275E-25	3751.7	3.565E-25	1333.1	2500	99310	27.6

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Title Honouliuli, 12/02/93 CTD, Station HZ, October 2000 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
1.835	146	0.01257	3.658	0.67935	26.1	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.029	2.029	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.67000	2.46e6	55.26	13.40	0.01762
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	23.5796	0.02500	0.0003	0.025	81.150	0.00001870

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.2428	34.814	24.941	0	0.007276	0.2581
7	1e-5	23.3360	34.906	24.8624	0	buoy flux	puff-ther
14	0.016	23.3631	34.904	24.7677	0	0.0008869	2.001
21	0.016	23.4248	34.878	24.4973	0	jet-plume	jet-cross
28	0.016	23.4304	34.916	24.5744	0	1.120	6.387
35	0.016	23.4461	34.941	24.5848	0	plu-cross	jet-strat
42	0.025	23.4711	34.95	24.5243	0	207.6	4.685
49	0.025	23.4856	34.952	24.481	0	plu-strat	
54	0.025	23.5211	34.948	24.352	0	9.580	
60.96	0.025	23.5796	34.95	24.1607	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep m	plume dia m	poll conc	dilution	hor dis m	
60.96	0.08881	2460000	1.000	0.000	
57.92	1.614	75820	31.20	4.105	
50.41	3.684	19020	120.5	6.830	-> merging
19.67	14.69	4397	440.4	14.94	-> trap level
11.60	30.73	3475	520.1	17.64	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 561.1m

--4/3 Power Law--		-Const Eddy Diff-		distance	Time	
conc	dilution	conc	dilution	m	sec	hrs
0.009645	826.9	0.01183	671.6	500.0	19290	5.4
1.609E-08	1388.7	2.581E-08	860.8	1000	39290	10.9
3.050E-14	2046.5	6.088E-14	1018.4	1500	59290	16.5
6.249E-20	2785.2	1.496E-19	[illegible].6	2000	79290	22.0
1.349E-25	3595.3	3.769E-25	[illegible].3	2500	99290	27.6

Jul 31, 1995, 9:38: 7 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 15 of 16
Title Honouliuli, 12/02/93 CTD, Station HZ, October 2005 Flows nonlinear

tot flow	# ports	port flow	spacing	effl sal	effl temp	far inc	far dis
2.069	146	0.01417	3.658	0.67935	26.1	500	2500
port dep	port dia	plume dia	total vel	horiz vel	vertl vel	asp coeff	print frq
60.96	0.09093	0.08881	2.287	2.287	0.000	0.10	500
port elev	ver angle	cont coef	effl den	poll conc	decay	Froude #	Roberts F
0.8382	0.0	0.954	-2.67000	2.46e6	55.26	15.11	0.01563
hor angle	red space	p amb den	p current	far dif	far vel	K:vel/cur	Stratif #
90	3.658	23.5796	0.02500	0.0003	0.025	91.500	.00001870

depth	current	density	salinity	temp	amb conc	N (freq)	red grav.
0.0	1e-5	23.2428	34.814	24.941	0	0.007276	0.2581
7	1e-5	23.3360	34.906	24.8624	0	buoy flux	puff-ther
14	0.016	23.3631	34.904	24.7677	0	0.0010000	2.257
21	0.016	23.4248	34.878	24.4973	0	jet-plume	jet-cross
28	0.016	23.4304	34.916	24.5744	0	1.263	7.202
35	0.016	23.4461	34.941	24.5848	0	plu-cross	jet-strat
42	0.025	23.4711	34.95	24.5243	0	234.1	4.974
49	0.025	23.4856	34.952	24.481	0	plu-strat	
54	0.025	23.5211	34.948	24.352	0	9.872	
60.96	0.025	23.5796	34.95	24.1607	0	hor dis>=	

CORMIX1 flow category algorithm is turned off.
146 L ¼ 534 m 1 to any range
Help: F1. Quit: <esc>. Configuration:ATNO0. FILE: honowntr;
UM INITIAL DILUTION CALCULATION (nonlinear mode)

plume dep	plume dia	poll conc	dilution	hor dis	
m	m			m	
60.96	0.08881	2460000	1.000	0.000	
58.01	1.699	75820	31.20	4.402	
50.72	3.680	20560	111.7	7.234	-> merging
19.25	14.39	4748	410.9	15.47	-> trap level
9.895	32.43	3693	488.7	18.61	-> begin overlap

FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of 562.8m

--4/3 Power Law--		-Const Eddy Diff-				
conc	dilution	conc	dilution	distance	Time	
				m	sec	hrs
0.01053	775.1	0.01290	630.2	500.0	19260	5.3
1.758E-08	1301.3	2.815E-08	807.8	1000	39260	10.9
3.331E-14	1917.5	6.639E-14	955.8	1500	59260	16.5
6.826E-20	2609.6	1.631E-19	1084.5	2000	79260	22.0
1.474E-25	3368.5	4.110E-25	1199.7	2500	99260	27.6