

Dispersion Report

Workspace: 72438-3InvioGN-11R

Study: Invio GN a metanodotto

Equipment Item: 11R Linea di mandata gas

72438-3InvioGN-11R\Invio GN a metanodotto\11R Linea di mandata gas

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (Leak) : 81,3

72438-3InvioGN-11R\Invio GN a metanodotto\11R Linea di mandata gas\81,3

Material to track	GAS NATURALE
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Weather: Category 2/F

Wind speed [m/s]	2
Pasquill stability	F stable - night with moderate clouds and light/moderate wind
Atmospheric temperature [degC]	25
Relative humidity [fraction]	0,75
Solar radiation flux [kW/m2]	0,5
Mixing layer height [m]	100

Observer Release Data and Observer Mass Data

Observer number	Release type	Start time [s]	Start downwind distance [m]	Unit	Masses or mass rates		
					Release	Rainout	Final
1	Continuous	0	0	kg/s	67,986	0	67,986
2	Continuous	90,5981	0	kg/s	67,986	0	67,986

Time-varying Observer Dispersion Data (before along-wind-diffusion effects)

Dispersion data correspond to an averaging time of: 18,75 s

Observer number	Time [s]	Down wind distance [m]	C/Li ne height [m]	C/Lin e conc [ppm]	Effect ive width [m]	Effect ive depth [m]	C/Line vapour temperature [degC]	C/Li ne liquid fraction	Centr oid velocity [m/s]	C/Lin e cloud density [kg/m ³]
1	0	0	4	999.99 9,37	0,4697 29	0,2350 36	-56,7905	0	300	1,0263 3
1	0,01	2,09785	4,000 05	647.22 3,73	0,8588 81	0,4296 35	-20,9524	0	161,53 4	1,0629 2
1	0,02	3,49953	4,000 17	524.05 9,49	1,1154 2	0,5578 8	-9,4201	0	123,71 8	1,0770 8
1	0,03	4,63123	4,000 35	454.24 5,63	1,3204 6	0,6603 6	-3,67709	0	104,11 6	1,0873 8
1	0,04	5,60638	4,000 57	407.42 8,32	1,4961	0,7481 36	-0,203747	0	91,637 5	1,0953 5
1	0,05	6,47725	4,000 83	373.04 1,94	1,6523 4	0,8262 07	2,1314	0	82,790 5	1,1018 7
1	0,06	7,27003	4,001 13	346.37 5,86	1,7947 1	0,8973 46	3,95228	0	76,107	1,1067 7
1	0,07	8,00226	4,001 47	324.87 8,39	1,9261 6	0,9630 27	5,36417	0	70,827 8	1,1108 6
1	0,08	8,68524	4,001 83	307.06 0,97	2,0488	1,0243	6,49751	0	66,523 9	1,1143 5
1	0,09	9,32982	4,002 22	291.91 4,56	2,1646 1	1,0821 6	7,4354	0	62,915 1	1,1173 7
1	0,1	9,94114	4,002 64	278.83 7,61	2,2745 4	1,1370 8	8,22672	0	59,835 6	1,1200 2
1	0,11	10,5246	4,003 08	267.37 7,84	2,3795 6	1,1895 4	8,90646	0	57,164	1,1223 8
1	0,12	11,0834	4,003 55	257.22 5,70	2,4802 7	1,2398 6	9,49815	0	54,818 2	1,1244 9
1	0,13	11,6205	4,004 03	248.14 8,66	2,5771 7	1,2882 7	10,019	0	52,737 2	1,1264



1	0,14	12,138	4,004	239.96	2,6706	1,3349	10,4819	0	50,874	1,1281
			54	8,26	8	8			8	3
1	0,15	12,6381	4,005	232.54	2,7611	1,3801	10,8969	0	49,194	1,1297
			07	1,76	6	8			7	2
1	0,16	13,1225	4,005	225.75	2,8489	1,4240	11,2717	0	47,668	1,1311
			62	7,73	4	3			8	8
1	0,17	13,5926	4,006	219.52	2,9342	1,4666	11,6123	0	46,274	1,1325
			18	6,71	6	5			6	3
1	0,18	14,0495	4,006	213.77	3,0173	1,5081	11,9236	0	44,994	1,1337
			76	8,12	3	4			6	8
1	0,19	14,494	4,007	208.45	3,0982	1,5485	12,2093	0	43,814	1,1349
			36	4,90	8	8			5	4
1	0,2	14,9266	4,007	203.51	3,1772	1,588	12,4725	0	42,723	1,1360
			97	1,05						3
1	0,212	15,4311	4,008	198.01	3,2694	1,6340	12,7625	0	41,515	1,1372
			73	8,63	7	9			5	4
1	0,226	16,0173	4,009	191.97	3,3769	1,6878	13,0785	0	40,193	1,1385
	4		67	8,16	9				7	8
1	0,243	16,6963	4,010	185.40	3,5019	1,7502	13,4191	0	38,762	1,1400
	68		83	4,77	5	2			5	4
1	0,264	17,4803	4,012	178.32	3,6468	1,8225	13,7818	0	37,230	1,1416
	416		28	8,34	2	8			2	3
1	0,289	18,3834	4,014	170.79	3,8144	1,9063	14,1635	0	35,608	1,1433
	299		08	3,60	4	1			3	3
1	0,319	19,4177	4,016	162.89	4,0073	2,0026	14,5592	0	33,917	1,1451
	159		34	0,41	2	5			7	2
1	0,354	20,5981	4,019	154.69	4,2288	2,1133	14,9643	0	32,177	1,1469
	991		18	8,97	2				1	8
1	0,397	21,9405	4,022	146.31	4,4827	2,2401	15,3738	0	30,406	1,1489
	989		74	0,47	5	4			9	
1	0,449	23,4608	4,027	137.82	4,7733	2,3853	15,7828	0	28,628	1,1508
	587		23	3,52	5				9	6
1	0,511	25,1779	4,032	129.32	5,1058	2,5513	16,187	0	26,862	1,1528
	504		89	8,35	1	6			5	3
1	0,585	27,1104	4,040	120.91	5,4858	2,7412	16,5823	0	25,126	1,1547
	805		02	4,58	7	2			7	8
1	0,674	29,2732	4,049	112.67	5,9192	2,9576	16,9644	0	23,441	1,1567
	966			7,37	1	9				1



1	0,781 959	31,6835	4,060 31	104.69 1,37	6,4120 2	3,2038 7	17,3305	0	21,820 9	1,1585 9
1	0,910 351	34,3771	4,074 5	96.979, 07	6,9739 3	3,4845 8	17,68	0	20,269 5	1,1604 1
1	0,991 66	35,9906	4,083 78	92.928, 85	7,3115 5	3,6532 5	17,862	0	19,454 2	1,1613 7
1	0,991 66	35,9906	4,083 78	92.928, 85	7,3115 5	3,6532 6	17,862	0	19,454 1	1,1613 7
1	1,064 42	37,3824	4,092 25	89.802, 26	7,5976 4	3,7961 9	18,0018	0	18,815 8	1,1621 1
1	1,249 31	40,7321	4,114 44	83.333, 54	8,2703 8	4,1322 9	18,289	0	17,48	1,1636 4
1	1,471 17	44,4671	4,142 14	77.370, 99	9,0033 9	4,4985 3	18,5516	0	16,244 8	1,1650 6
1	1,737 4	48,6332	4,176 54	71.829, 41	9,8032 6	4,8981 9	18,7937	0	15,101 3	1,1663 8
1	2,056 88	53,2812	4,218 98	66.662, 63	10,674 6	5,3335 5	19,0178	0	14,043 8	1,1676 1
1	2,440 26	58,4691	4,270 82	61.836, 58	11,621 3	5,8066 4	19,2259	0	13,067 3	1,1687 6
1	2,900 31	64,2606	4,333 35	57.326, 61	12,646 7	6,3190 8	19,4193	0	12,167 3	1,1698 4
1	3,452 37	70,7313	4,407 66	53.108, 72	13,758 5	6,8746 8	19,7512	0	11,339 3	1,1703 1
1	4,114 84	77,9748	4,495 31	49.154, 72	14,961 8	7,4760 4	20,1496	0	10,577 1	1,1704 3
1	4,909 81	86,0892	4,599 17	45.449, 79	16,257 4	8,1235 9	20,5242	0	9,8772 2	1,1705 4
1	5,863 77	95,1864	4,723 15	41.979, 72	17,647 6	8,8184 1	20,8763	0	9,2359 2	1,1706 3
1	7,008 53	105,395	4,872 15	38.730, 70	19,133 7	9,5612	21,2072	0	8,6497 8	1,1707 1
1	8,382 23	116,86	5,052 31	35.690, 07	20,715 9	10,352 1	21,5181	0	8,1155 8	1,1707 7
1	10,03 07	129,792	5,271 75	32.831, 09	22,403 8	11,195 8	21,8116	0	7,6272 4	1,1708 2
1	12,00 88	144,401	5,540 52	30.143, 79	24,197 8	12,092 6	22,0889	0	7,1823 3	1,1708 5



1	14,38 26	160,925	5,871 49	27.619, 04	26,096 6	13,041 7	22,3507	0	6,7786 8	1,1708 6
1	17,23 11	179,654	6,281 21	25.245, 21	28,099 6	14,043	22,5984	0	6,4138 4	1,1708 5
1	20,64 93	200,957	6,790 91	23.006, 63	30,211 3	15,098 7	22,8335	0	6,0847 7	1,1708 1
1	21,09 66	203,668	6,859 03	22.750, 14	30,468 4	15,227 2	22,8605	0	6,0481	1,1708 1
1	24,75 12	225,127	7,431 13	20.900, 01	32,418	16,201 9	23,0565	0	5,7913 1	1,1707 5
1	29,67 34	252,728	8,235 48	18.903, 91	34,734 7	17,360 1	23,2698	0	5,5304	1,1706 6
1	35,58 01	284,599	9,239 76	16.998, 71	37,193 6	18,589 3	23,4753	0	5,2990 3	1,1705 3
1	42,66 81	321,426	10,49 65	15.182, 51	39,799 6	19,892 2	23,6734	0	5,0984 8	1,1703 6
1	51,17 37	364,115	12,06 94	13.444, 98	42,586 1	21,285 3	23,8653	0	4,9293 4	1,1701 3
1	61,38 05	413,736	14,03 34	11.784, 03	45,589 9	22,787	24,0515	0	4,7941 9	1,1698 4
1	73,62 86	471,797	16,46 89	10.192, 04	48,904 9	24,444 4	24,2328	0	4,6950 3	1,1694 7
1	84,22 04	521,168	18,62 11	9.061,1 1	51,625 8	25,804 7	24,3636	0	4,6471 1	1,1691 5
2	90,59 81	0	4	999.99 9,37	0,4697 29	0,2350 36	-56,7905	0	300	1,0263 3
2	90,60 81	2,09785	4,000 05	647.22 3,73	0,8588 81	0,4296 35	-20,9524	0	161,53 4	1,0629 2
2	90,61 81	3,49953	4,000 17	524.05 9,49	1,1154 2	0,5578 8	-9,4201	0	123,71 8	1,0770 8
2	90,62 81	4,63123	4,000 35	454.24 5,63	1,3204 6	0,6603 6	-3,67709	0	104,11 6	1,0873 8
2	90,63 81	5,60638	4,000 57	407.42 8,32	1,4961	0,7481 36	-0,203747	0	91,637 5	1,0953 5
2	90,64 81	6,47725	4,000 83	373.04 1,94	1,6523 4	0,8262 07	2,1314	0	82,790 5	1,1018 7
2	90,65	7,27003	4,001	346.37	1,7947	0,8973	3,95228	0	76,107	1,1067



	81		13	5,86	1	46				7
2	90,66	8,00226	4,001	324.87	1,9261	0,9630	5,36417	0	70,827	1,1108
	81		47	8,39	6	27			8	6
2	90,67	8,68524	4,001	307.06	2,0488	1,0243	6,49751	0	66,523	1,1143
	81		83	0,97					9	5
2	90,68	9,32982	4,002	291.91	2,1646	1,0821	7,4354	0	62,915	1,1173
	81		22	4,56	1	6			1	7
2	90,69	9,94114	4,002	278.83	2,2745	1,1370	8,22672	0	59,835	1,1200
	81		64	7,61	4	8			6	2
2	90,70	10,5246	4,003	267.37	2,3795	1,1895	8,90646	0	57,164	1,1223
	81		08	7,84	6	4				8
2	90,71	11,0834	4,003	257.22	2,4802	1,2398	9,49815	0	54,818	1,1244
	81		55	5,70	7	6			2	9
2	90,72	11,6205	4,004	248.14	2,5771	1,2882	10,019	0	52,737	1,1264
	81		03	8,66	7	7			2	
2	90,73	12,138	4,004	239.96	2,6706	1,3349	10,4819	0	50,874	1,1281
	81		54	8,26	8	8			8	3
2	90,74	12,6381	4,005	232.54	2,7611	1,3801	10,8969	0	49,194	1,1297
	81		07	1,76	6	8			7	2
2	90,75	13,1225	4,005	225.75	2,8489	1,4240	11,2717	0	47,668	1,1311
	81		62	7,73	4	3			8	8
2	90,76	13,5926	4,006	219.52	2,9342	1,4666	11,6123	0	46,274	1,1325
	81		18	6,71	6	5			6	3
2	90,77	14,0495	4,006	213.77	3,0173	1,5081	11,9236	0	44,994	1,1337
	81		76	8,12	3	4			6	8
2	90,78	14,494	4,007	208.45	3,0982	1,5485	12,2093	0	43,814	1,1349
	81		36	4,90	8	8			5	4
2	90,79	14,9266	4,007	203.51	3,1772	1,588	12,4725	0	42,723	1,1360
	81		97	1,05						3
2	90,81	15,4311	4,008	198.01	3,2694	1,6340	12,7625	0	41,515	1,1372
	01		73	8,63	7	9			5	4
2	90,82	16,0173	4,009	191.97	3,3769	1,6878	13,0785	0	40,193	1,1385
	45		67	8,16	9				7	8
2	90,84	16,6963	4,010	185.40	3,5019	1,7502	13,4191	0	38,762	1,1400
	18		83	4,77	5	2			5	4
2	90,86	17,4803	4,012	178.32	3,6468	1,8225	13,7818	0	37,230	1,1416
	25		28	8,34	2	8			2	3
2	90,88	18,3834	4,014	170.79	3,8144	1,9063	14,1635	0	35,608	1,1433



	74		08	3,60	4	1			3	3
2	90,91 73	19,4177	4,016 34	162.89 0,41	4,0073 2	2,0026 5	14,5592	0	33,917 7	1,1451 2
2	90,95 31	20,5981	4,019 18	154.69 8,97	4,2288 2	2,1133	14,9643	0	32,177 1	1,1469 8
2	90,99 61	21,9405	4,022 74	146.31 0,47	4,4827 5	2,2401 4	15,3738	0	30,406 9	1,1489
2	91,04 77	23,4608	4,027 23	137.82 3,52	4,7733 5	2,3853	15,7828	0	28,628 9	1,1508 6
2	91,10 96	25,1779	4,032 89	129.32 8,35	5,1058 1	2,5513 6	16,187	0	26,862 5	1,1528 3
2	91,18 39	27,1104	4,040 02	120.91 4,58	5,4858 7	2,7412 2	16,5823	0	25,126 7	1,1547 8
2	91,27 31	29,2732	4,049	112.67 7,37	5,9192 1	2,9576 9	16,9644	0	23,441	1,1567 1
2	91,38 01	31,6835	4,060 31	104.69 1,37	6,4120 2	3,2038 7	17,3305	0	21,820 9	1,1585 9
2	91,50 85	34,3771	4,074 5	96.979, 07	6,9739 3	3,4845 8	17,68	0	20,269 5	1,1604 1
2	91,58 98	35,9906	4,083 78	92.928, 85	7,3115 5	3,6532 5	17,862	0	19,454 2	1,1613 7
2	91,58 98	35,9906	4,083 78	92.928, 85	7,3115 5	3,6532 6	17,862	0	19,454 1	1,1613 7
2	91,66 25	37,3824	4,092 25	89.802, 26	7,5976 4	3,7961 9	18,0018	0	18,815 8	1,1621 1
2	91,84 74	40,7321	4,114 44	83.333, 54	8,2703 8	4,1322 9	18,289	0	17,48	1,1636 4
2	92,06 93	44,4671	4,142 14	77.370, 99	9,0033 9	4,4985 3	18,5516	0	16,244 8	1,1650 6
2	92,33 55	48,6332	4,176 54	71.829, 41	9,8032 6	4,8981 9	18,7937	0	15,101 3	1,1663 8
2	92,65 5	53,2812	4,218 98	66.662, 63	10,674 6	5,3335 5	19,0178	0	14,043 8	1,1676 1
2	93,03 84	58,4691	4,270 82	61.836, 58	11,621 3	5,8066 4	19,2259	0	13,067 3	1,1687 6
2	93,49 84	64,2606	4,333 35	57.326, 61	12,646 7	6,3190 8	19,4193	0	12,167 3	1,1698 4
2	94,05	70,7313	4,407	53.108, 13,758	13,758	6,8746	19,7512	0	11,339	1,1703



	05		66	72	5	8			3	1
2	94,71 29	77,9748	4,495 31	49.154, 72	14,961 8	7,4760 4	20,1496	0	10,577 1	1,1704 3
2	95,50 79	86,0892	4,599 17	45.449, 79	16,257 4	8,1235 9	20,5242	0	9,8772 2	1,1705 4
2	96,46 19	95,1864	4,723 15	41.979, 72	17,647 6	8,8184 1	20,8763	0	9,2359 2	1,1706 3
2	97,60 66	105,395	4,872 15	38.730, 70	19,133 7	9,5612	21,2072	0	8,6497 8	1,1707 1
2	98,98 03	116,86	5,052 31	35.690, 07	20,715 9	10,352 1	21,5181	0	8,1155 8	1,1707 7
2	100,6 29	129,792	5,271 75	32.831, 09	22,403 8	11,195 8	21,8116	0	7,6272 4	1,1708 2
2	102,6 07	144,401	5,540 52	30.143, 79	24,197 8	12,092 6	22,0889	0	7,1823 3	1,1708 5
2	104,9 81	160,925	5,871 49	27.619, 04	26,096 6	13,041 7	22,3507	0	6,7786 8	1,1708 6
2	107,8 29	179,654	6,281 21	25.245, 21	28,099 6	14,043	22,5984	0	6,4138 4	1,1708 5
2	111,2 47	200,957	6,790 91	23.006, 63	30,211 3	15,098 7	22,8335	0	6,0847 7	1,1708 1
2	111,6 95	203,668	6,859 03	22.750, 14	30,468 4	15,227 2	22,8605	0	6,0481	1,1708 1
2	115,3 49	225,127	7,431 13	20.900, 01	32,418	16,201 9	23,0565	0	5,7913 1	1,1707 5
2	120,2 72	252,728	8,235 48	18.903, 91	34,734 7	17,360 1	23,2698	0	5,5304	1,1706 6
2	126,1 78	284,599	9,239 76	16.998, 71	37,193 6	18,589 3	23,4753	0	5,2990 3	1,1705 3
2	133,2 66	321,426	10,49 65	15.182, 51	39,799 6	19,892 2	23,6734	0	5,0984 8	1,1703 6
2	141,7 72	364,115	12,06 94	13.444, 98	42,586 1	21,285 3	23,8653	0	4,9293 4	1,1701 3
2	151,9 79	413,736	14,03 34	11.784, 03	45,589 9	22,787	24,0515	0	4,7941 9	1,1698 4
2	164,2 27	471,797	16,46 89	10.192, 04	48,904 9	24,444 4	24,2328	0	4,6950 3	1,1694 7
2	174,8	521,168	18,62	9.061,1	51,625	25,804	24,3636	0	4,6471	1,1691



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Weather: Category 5/D

Wind speed [m/s]	5
Pasquill stability	D neutral - little sun and high wind or overcast/windy night
Atmospheric temperature [degC]	25
Relative humidity [fraction]	0,75
Solar radiation flux [kW/m2]	0,5
Mixing layer height [m]	800

Observer Release Data and Observer Mass Data

Observer number	Release type	Start time [s]	Start downwind distance [m]	Unit	Masses or mass rates		
					Release	Rainout	Final
1	Continuous	0	0	kg/s	67,986	0	67,986
2	Continuous	90,5981	0	kg/s	67,986	0	67,986

Time-varying Observer Dispersion Data (before along-wind-diffusion effects)

Dispersion data correspond to an averaging time of: 18,75 s

Observer number	Time [s]	Down wind distance [m]	C/Li ne height [m]	C/Li ne conc [ppm]	Effect ive width [m]	Effect ive depth [m]	C/Li ne vapour temperature [degC]	C/Li ne liqui d fracti on	Centr oid veloci ty [m/s]	C/Li ne cloud densi ty [kg/m3]
1	0	0	4	999.99 9,37	0,4699	0,2349 5	-56,7905	0	300	1,0263 3
1	0,01	2,10187	4,000 05	644.77 4,90	0,8593 88	0,4296 94	-20,8804	0	162,08 2	1,0638 9
1	0,02	3,50932	4,000 17	520.17 1,70	1,1174 2	0,5587 11	-9,27995	0	124,30 8	1,0784 2
1	0,03	4,6469	4,000	449.38	1,3244	0,6622	-3,50032	0	104,70	1,0889



			34	0,30	9	43			3	9
1	0,04	5,62786	4,000	401.82	1,5025	0,7512	-	0	92,208	1,0971
			57	7,63	3	63	0,004365		6	8
							48			
1	0,05	6,50433	4,000	366.85	1,6614	0,8307	2,35851	0	83,344	1,1038
			82	7,69	7	37			2	4
1	0,06	7,30255	4,001	339.70	1,8067	0,9033	4,19461	0	76,642	1,1088
			12	6,99	9	94			4	8
1	0,07	8,03999	4,001	317.79	1,9413	0,9706	5,61885	0	71,345	1,1130
			45	7,24	9	95			2	8
1	0,08	8,72803	4,001	299.61	2,0673	1,0336	6,7627	0	67,023	1,1166
			8	9,33	7	9			4	7
1	0,09	9,37755	4,002	284.15	2,1866	1,0933	7,7095	0	63,398	1,1197
			18	6,19	8	4				8
1	0,1	9,99366	4,002	270.79	2,3002	1,1501	8,50857	0	60,302	1,1225
			59	6,65	5	3			9	1
1	0,11	10,5817	4,003	259.08	2,4090	1,2045	9,19504	0	57,617	1,1249
			01	4,21	3	2			1	4
1	0,12	11,145	4,003	248.70	2,5136	1,2568	9,79271	0	55,258	1,1271
			46	3,01	3	2				2
1	0,13	11,6864	4,003	239.41	2,6145	1,3072	10,3189	0	53,164	1,1290
			93	7,51	4	7			8	9
1	0,14	12,2074	4,004	231.05	2,7120	1,3560	10,7862	0	51,292	1,1308
			42	3,47	8	4			7	8
1	0,15	12,7105	4,004	223.46	2,8066	1,4033	11,2048	0	49,604	1,1325
			93	3,63	3	2			8	1
1	0,16	13,1972	4,005	216.53	2,8985	1,4492	11,5827	0	48,072	1,1340
			45	3,06	2	6			6	2
1	0,17	13,6694	4,005	210.16	2,9880	1,4940	11,9261	0	46,672	1,1354
			99	6,94	5	3			7	1
1	0,18	14,1289	4,006	204.28	3,0755	1,5377	12,2404	0	45,385	1,1367
			54	4,86	5	8			7	
1	0,19	14,5755	4,007	198.83	3,1610	1,5805	12,5287	0	44,199	1,1379
			11	9,26	1				5	
1	0,2	15,0111	4,007	193.76	3,2447	1,6223	12,795	0	43,099	1,1390
			69	9,21	5	7			9	2
1	0,212	15,5202	4,008	188.12	3,3431	1,6715	13,0889	0	41,881	1,1402
			41	4,70	3	6				7



1	0,226 4	16,1128	4,009 29	181.90 6,44	3,4583 9	1,7292	13,4097	0	40,544 6	1,1416 6
1	0,243 68	16,8001	4,010 38	175.12 8,43	3,5931 6	1,7965 8	13,7558	0	39,095 5	1,1431 8
1	0,264 416	17,594	4,011 73	167.82 3,82	3,7504	1,8752	14,1247	0	37,542 9	1,1448 3
1	0,289 299	18,5073	4,013 41	160.04 4,76	3,9335 2	1,9667 6	14,5131	0	35,899 8	1,1466
1	0,319 159	19,5538	4,015 49	151.85 7,74	4,1465 1	2,0732 6	14,9168	0	34,182	1,1484 6
1	0,354 991	20,7475	4,018 09	143.34 6,51	4,394	2,197	15,3311	0	32,408 9	1,1504 2
1	0,397 989	22,1028	4,021 33	134.60 7,32	4,6813 3	2,3406 7	15,751	0	30,602 1	1,1524 4
1	0,449 587	23,6349	4,025 37	125.73 9,05	5,0149 1	2,5074 6	16,1714	0	28,783 2	1,1544 9
1	0,511 504	25,3598	4,030 39	116.83 9,45	5,4024 1	2,7012 1	16,5877	0	26,973 3	1,1565 7
1	0,585 805	27,296	4,036 62	107.99 7,63	5,8531 5	2,9265 8	16,9958	0	25,191 2	1,1586 5
1	0,674 966	29,4645	4,044 32	99.292, 87	6,3783 8	3,1892	17,3923	0	23,453 3	1,1607
1	0,781 959	31,885	4,053 8	90.860, 94	6,9865 4	3,4932 7	17,7716	0	21,784 9	1,1627
1	0,834 489	33,0137	4,058 52	87.466, 84	7,2662 7	3,6331 4	17,9229	0	21,112 3	1,1635
1	0,834 489	33,0137	4,058 52	87.466, 84	7,2662 9	3,6331 5	17,9229	0	21,112 2	1,1635
1	0,910 351	34,5831	4,065 41	83.362, 83	7,6377 6	3,8188 9	18,1051	0	20,291 5	1,1644 8
1	1,064 42	37,6055	4,079 67	77.033, 21	8,2943 5	4,1471 8	18,384	0	19,011 6	1,1659 9
1	1,249 31	41,0096	4,097 21	71.426, 86	8,9771 9	4,4886	18,6291	0	17,871 4	1,1673 3
1	1,471 17	44,8531	4,118 7	66.329, 30	9,6991 7	4,8495 9	18,8504	0	16,833 7	1,1685 4
1	1,737 4	49,2011	4,144 85	61.627, 72	10,468 7	5,2343 5	19,0532	0	15,878 6	1,1696 7



1	2,056 88	54,1265	4,176 33	57.256, 78	11,291 8	5,6459 2	19,2408	0	14,994 8	1,1707 2
1	2,440 26	59,709	4,213 75	53.183, 10	12,175	6,0875 1	19,5748	0	14,176 3	1,1711 2
1	2,900 31	66,0463	4,258 04	49.368, 42	13,122 4	6,5612	19,9608	0	13,416	1,1712 4
1	3,452 37	73,2477	4,310 8	45.789, 29	14,136 1	7,0680 5	20,3244	0	12,709 9	1,1713 5
1	4,114 84	81,4368	4,374 22	42.429, 77	15,218 4	7,6092 2	20,6672	0	12,054 7	1,1714 4
1	4,909 81	90,764	4,451 1	39.269, 59	16,373 5	8,1867 8	20,991	0	11,447	1,1715 2
1	5,863 77	101,395	4,545 08	36.297, 83	17,602 7	8,8014 1	21,2968	0	10,884 6	1,1715 8
1	7,008 53	113,531	4,661	33.500, 06	18,908 8	9,4544 3	21,5858	0	10,364 9	1,1716 4
1	8,382 23	127,402	4,805 32	30.863, 29	20,293 8	10,147	21,8593	0	9,8856 3	1,1716 8
1	10,03 07	143,287	4,986 82	28.372, 75	21,761 4	10,880 7	22,1184	0	9,4443 2	1,1717 1
1	12,00 88	161,525	5,217 31	26.010, 85	23,318 1	11,659 1	22,3646	0	9,0381 4	1,1717 3
1	14,38 26	182,504	5,512 81	23.764, 20	24,969 3	12,484 7	22,5989	0	8,6654 2	1,1717 3
1	15,64 85	193,371	5,678 95	22.750, 14	25,775 3	12,887 7	22,7046	0	8,5023 3	1,1717 3
1	17,23 11	206,634	5,896 69	21.622, 66	26,717	13,358 6	22,8219	0	8,3258 1	1,1717 3
1	20,64 93	234,46	6,398 81	19.567, 34	28,575 4	14,287 8	23,0348	0	8,0176 1	1,1717 1
1	24,75 12	266,759	7,052 76	17.577, 47	30,578 1	15,289 2	23,2389	0	7,7382 8	1,1716 8
1	29,67 34	304,248	7,912 64	15.637, 44	32,759 5	16,379 9	23,4346	0	7,4888 5	1,1716 4
1	29,74 08	304,752	7,924 96	15.613, 51	32,788	16,394 1	23,437	0	7,4859 4	1,1716 4
2	90,59	0	4	999.99	0,4699	0,2349	-56,7905	0	300	1,0263



	81			9,37		5				3	
2	90,60 81	2,10187	4,000 05	644.77 4,90	0,8593 88	0,4296 94	-20,8804	0	162,08 2	1,0638 9	
2	90,61 81	3,50932	4,000 17	520.17 1,70	1,1174 2	0,5587 11	-9,27995	0	124,30 8	1,0784 2	
2	90,62 81	4,6469	4,000 34	449.38 0,30	1,3244 9	0,6622 43	-3,50032	0	104,70 3	1,0889 9	
2	90,63 81	5,62786	4,000 57	401.82 7,63	1,5025 3	0,7512 63	- 0,004365 48	0	92,208 6	1,0971 8	
2	90,64 81	6,50433	4,000 82	366.85 7,69	1,6614 7	0,8307 37	2,35851	0	83,344 2	1,1038 4	
2	90,65 81	7,30255	4,001 12	339.70 6,99	1,8067 9	0,9033 94	4,19461	0	76,642 4	1,1088 8	
2	90,66 81	8,03999	4,001 45	317.79 7,24	1,9413 9	0,9706 95	5,61885	0	71,345 2	1,1130 8	
2	90,67 81	8,72803	4,001 8	299.61 9,33	2,0673 7	1,0336 9	6,7627	0	67,023 4	1,1166 7	
2	90,68 81	9,37755	4,002 18	284.15 6,19	2,1866 8	1,0933 4	7,7095	0	63,398 8	1,1197 8	
2	90,69 81	9,99366	4,002 59	270.79 6,65	2,3002 5	1,1501 3	8,50857	0	60,302 9	1,1225 1	
2	90,70 81	10,5817	4,003 01	259.08 4,21	2,4090 3	1,2045 2	9,19504	0	57,617 1	1,1249 4	
2	90,71 81	11,145	4,003 46	248.70 3,01	2,5136 3	1,2568 2	9,79271	0	55,258 2	1,1271 2	
2	90,72 81	11,6864	4,003 93	239.41 7,51	2,6145 4	1,3072 7	10,3189	0	53,164 8	1,1290 9	
2	90,73 81	12,2074	4,004 42	231.05 3,47	2,7120 8	1,3560 4	10,7862	0	51,292 7	1,1308 8	
2	90,74 81	12,7105	4,004 93	223.46 3,63	2,8066 3	1,4033 2	11,2048	0	49,604 8	1,1325 1	
2	90,75 81	13,1972	4,005 45	216.53 3,06	2,8985 2	1,4492 6	11,5827	0	48,072 6	1,1340 2	
2	90,76 81	13,6694	4,005 99	210.16 6,94	2,9880 5	1,4940 3	11,9261	0	46,672 7	1,1354 1	
2	90,77 81	14,1289	4,006 54	204.28 4,86	3,0755 5	1,5377 8	12,2404	0	45,385 7	1,1367 7	



2	90,78 81	14,5755	4,007 11	198.83 9,26	3,1610 1	1,5805	12,5287	0	44,199 5	1,1379
2	90,79 81	15,0111	4,007 69	193.76 9,21	3,2447 5	1,6223 7	12,795	0	43,099 9	1,1390 2
2	90,81 01	15,5202	4,008 41	188.12 4,70	3,3431 3	1,6715 6	13,0889	0	41,881	1,1402 7
2	90,82 45	16,1128	4,009 29	181.90 6,44	3,4583 9	1,7292	13,4097	0	40,544 6	1,1416 6
2	90,84 18	16,8001	4,010 38	175.12 8,43	3,5931 6	1,7965 8	13,7558	0	39,095 5	1,1431 8
2	90,86 25	17,594	4,011 73	167.82 3,82	3,7504	1,8752	14,1247	0	37,542 9	1,1448 3
2	90,88 74	18,5073	4,013 41	160.04 4,76	3,9335 2	1,9667 6	14,5131	0	35,899 8	1,1466
2	90,91 73	19,5538	4,015 49	151.85 7,74	4,1465 1	2,0732 6	14,9168	0	34,182	1,1484 6
2	90,95 31	20,7475	4,018 09	143.34 6,51	4,394	2,197	15,3311	0	32,408 9	1,1504 2
2	90,99 61	22,1028	4,021 33	134.60 7,32	4,6813 3	2,3406 7	15,751	0	30,602 1	1,1524 4
2	91,04 77	23,6349	4,025 37	125.73 9,05	5,0149 1	2,5074 6	16,1714	0	28,783 2	1,1544 9
2	91,10 96	25,3598	4,030 39	116.83 9,45	5,4024 1	2,7012 1	16,5877	0	26,973 3	1,1565 7
2	91,18 39	27,296	4,036 62	107.99 7,63	5,8531 5	2,9265 8	16,9958	0	25,191 2	1,1586 5
2	91,27 31	29,4645	4,044 32	99.292, 87	6,3783 8	3,1892	17,3923	0	23,453 3	1,1607
2	91,38 01	31,885	4,053 8	90.860, 94	6,9865 4	3,4932 7	17,7716	0	21,784 9	1,1627
2	91,43 26	33,0137	4,058 52	87.466, 84	7,2662 7	3,6331 4	17,9229	0	21,112 3	1,1635
2	91,43 26	33,0137	4,058 52	87.466, 84	7,2662 9	3,6331 5	17,9229	0	21,112 2	1,1635
2	91,50 85	34,5831	4,065 41	83.362, 83	7,6377 6	3,8188 9	18,1051	0	20,291 5	1,1644 8
2	91,66 25	37,6055	4,079 67	77.033, 21	8,2943 5	4,1471 8	18,384	0	19,011 6	1,1659 9



2	91,84 74	41,0096	4,097 21	71.426, 86	8,9771 9	4,4886	18,6291	0	17,871 4	1,1673 3
2	92,06 93	44,8531	4,118 7	66.329, 30	9,6991 7	4,8495 9	18,8504	0	16,833 7	1,1685 4
2	92,33 55	49,2011	4,144 85	61.627, 72	10,468 7	5,2343 5	19,0532	0	15,878 6	1,1696 7
2	92,65 5	54,1265	4,176 33	57.256, 78	11,291 8	5,6459 2	19,2408	0	14,994 8	1,1707 2
2	93,03 84	59,709	4,213 75	53.183, 10	12,175	6,0875 1	19,5748	0	14,176 3	1,1711 2
2	93,49 84	66,0463	4,258 04	49.368, 42	13,122 4	6,5612	19,9608	0	13,416	1,1712 4
2	94,05 05	73,2477	4,310 8	45.789, 29	14,136 1	7,0680 5	20,3244	0	12,709 9	1,1713 5
2	94,71 29	81,4368	4,374 22	42.429, 77	15,218 4	7,6092 2	20,6672	0	12,054 7	1,1714 4
2	95,50 79	90,764	4,451 1	39.269, 59	16,373 5	8,1867 8	20,991	0	11,447	1,1715 2
2	96,46 19	101,395	4,545 08	36.297, 83	17,602 7	8,8014 1	21,2968	0	10,884 6	1,1715 8
2	97,60 66	113,531	4,661	33.500, 06	18,908 8	9,4544 3	21,5858	0	10,364 9	1,1716 4
2	98,98 03	127,402	4,805 32	30.863, 29	20,293 8	10,147	21,8593	0	9,8856 3	1,1716 8
2	100,6 29	143,287	4,986 82	28.372, 75	21,761 4	10,880 7	22,1184	0	9,4443 2	1,1717 1
2	102,6 07	161,525	5,217 31	26.010, 85	23,318 1	11,659 1	22,3646	0	9,0381 4	1,1717 3
2	104,9 81	182,504	5,512 81	23.764, 20	24,969 3	12,484 7	22,5989	0	8,6654 2	1,1717 3
2	106,2 47	193,371	5,678 95	22.750, 14	25,775 3	12,887 7	22,7046	0	8,5023 3	1,1717 3
2	107,8 29	206,634	5,896 69	21.622, 66	26,717	13,358 6	22,8219	0	8,3258 1	1,1717 3
2	111,2 47	234,46	6,398 81	19.567, 34	28,575 4	14,287 8	23,0348	0	8,0176 1	1,1717 1
2	115,3 49	266,759	7,052 76	17.577, 47	30,578 1	15,289 2	23,2389	0	7,7382 8	1,1716 8



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2	120,2 72	304,248	7,912 64	15.637, 44	32,759 5	16,379 9	23,4346	0	7,4888 5	1,1716 4
2	120,3 39	304,752	7,924 96	15.613, 51	32,788	16,394 1	23,437	0	7,4859 4	1,1716 4

