

**Supplementary Table 12: Determination of transcription units architecture and calculation of 5'UTR length**

TU	Strand	Start	End	Len	MU Assembly	TSS	Current Annotation	Assembly	Promoter	Start	5'UTR Len
TU-0001	FWD	150	5000	4850	MU-1;MU-2	148	thrL;thrA;thrB;thrC		thrL	190	42
TU-0002	FWD	150	5000	4850	MU-1;MU-2	163	thrL;thrA;thrB;thrC		thrL	190	27
TU-0003	FWD	150	5000	4850	MU-1;MU-2	170	thrL;thrA;thrB;thrC		thrL	190	20
TU-0004	FWD	2600	5000	2400	MU-2	2688	thrB;thrC		thrB	2801	113
TU-0005	FWD	5050	5525	475	MU-3	5118	yaaX		yaaX	5234	116
TU-0006	FWD	8200	9200	1000	MU-4	8191	talB		talB	8238	47
TU-0007	FWD	8200	9200	1000	MU-4	8198	talB		talB	8238	40
TU-0008	FWD	8200	9200	1000	MU-4	8204	talB		talB	8238	34
TU-0009	FWD	8200	9200	1000	MU-4	8211	talB		talB	8238	27
TU-0010	FWD	8200	9200	1000	MU-4	8230	talB		talB	8238	8
TU-0011	FWD	9300	10100	800	MU-5	9277	mog		mog	9306	29
TU-0012	FWD	12051	15326	3275	MU-6;MU-7	12048	dnaK;Tpke11;dnaJ		dnaK	12163	115
TU-0013	FWD	12051	15326	3275	MU-6;MU-7	12123	dnaK;Tpke11;dnaJ		dnaK	12163	40
TU-0014	FWD	12051	15326	3275	MU-6;MU-7	12159	dnaK;Tpke11;dnaJ		dnaK	12163	4
TU-0015	FWD	12051	15326	3275	MU-6;MU-7	12142	dnaK;Tpke11;dnaJ		dnaK	12163	21
TU-0016	FWD	14076	15326	1250	MU-7	14052	Tpke11;dnaJ		Tpke11	14080	28
TU-0017	FWD	15351	16801	1450	MU-8	15247	insL		insL	15445	198
TU-0018	FWD	15351	16801	1450	MU-8	15253	insL		insL	15445	192
TU-0019	FWD	15351	16801	1450	MU-8	15276	insL		insL	15445	169
TU-0020	FWD	15351	16801	1450	MU-8	15338	insL		insL	15445	107
TU-0021	FWD	16976	17051	75	MU-9	16959	sokC		sokC	16952	-7
TU-0022	FWD	17576	19701	2125	MU-10	17462	nhaA;nhaR		nhaA	17489	27
TU-0023	FWD	19801	20501	700	MU-11	19727	NT				
TU-0024	FWD	19801	20501	700	MU-11	19742	NT				
TU-0025	FWD	21001	21376	375	MU-12	20912	yaaY		yaaY	21181	269
TU-0026	FWD	21401	24976	3575	MU-13	21383	ribF;ileS		ribF	21407	24
TU-0027	FWD	21401	24976	3575	MU-13	21395	ribF;ileS		ribF	21407	12
TU-0028	FWD	25001	25726	725	MU-14	24971	lspA		lspA	25207	236
TU-0029	FWD	25001	25726	725	MU-14	25006	lspA		lspA	25207	201
TU-0030	FWD	25751	28201	2450	MU-15	25695	fkpB;ispH;rihC		fkpB	25826	131
TU-0031	FWD	25751	28201	2450	MU-15	25698	fkpB;ispH;rihC		fkpB	25826	128
TU-0032	FWD	25751	28201	2450	MU-15	25701	fkpB;ispH;rihC		fkpB	25826	125
TU-0033	FWD	25751	28201	2450	MU-15	25804	fkpB;ispH;rihC		fkpB	25826	22
TU-0034	FWD	28276	29201	925	MU-16	28289	dapB		dapB	28374	85
TU-0035	FWD	28276	29201	925	MU-16	28343	dapB		dapB	28374	31
TU-0036	FWD	29555	34055	4500	MU-17	29551	carA;carB		carA	29651	100
TU-0037	FWD	29555	34055	4500	MU-17	29620	carA;carB		carA	29651	31
TU-0038	FWD	29555	34055	4500	MU-17	29632	carA;carB		carA	29651	19
TU-0039	FWD	34234	34784	550	MU-18	34226	caiF		caiF	34300	74
TU-0040	FWD	34234	34784	550	MU-18	34273	caiF		caiF	34300	27
TU-0041	FWD	42403	45750	3347	MU-19		fixA;fixB;fixC;fixX		fixA	42403	
TU-0042	FWD	45807	47138	1331	MU-20		yaaU		yaaU	45807	
TU-0043	FWD	47234	49509	2275	MU-21	47215	kefF;kefC		kefF	47246	31
TU-0044	FWD	49809	50509	700	MU-22	49788	folA		folA	49823	35

TU-0045	FWD	49809	50509	700 MU-22	49799 folA	folA	49823	24
TU-0046	FWD	57284	58734	1450 MU-23	57259 djIA	djIA	57364	105
TU-0047	FWD	57284	58734	1450 MU-23	57261 djIA	djIA	57364	103
TU-0048	FWD	58784	59709	925 MU-24	58946 yabP	yabP	58474	-472
TU-0049	FWD	70184	71184	1000 MU-25	70221 araC	araC	70387	166
TU-0050	FWD	71234	72284	1050 MU-26	71240 yabI	yabI	71351	111
TU-0051	FWD	71234	72284	1050 MU-26	71271 yabI	yabI	71351	80
TU-0052	FWD	77409	78909	1500 MU-27	77357 sgrS;setA	sgrS	77367	10
TU-0053	FWD	77409	78909	1500 MU-27	77367 sgrS;setA	sgrS	77367	0
TU-0054	FWD	84359	84734	375 MU-28	84298 leuO	leuO	84368	70
TU-0055	FWD	84359	84734	375 MU-28	84307 leuO	leuO	84368	61
TU-0056	FWD	85609	87834	2225 MU-29	85599 ilvI;ilvH	ilvI	85630	31
TU-0057	FWD	85609	87834	2225 MU-29	85604 ilvI;ilvH	ilvI	85630	26
TU-0058	FWD	88009	89159	1150 MU-30	87837 fruR	fruR	88028	191
TU-0059	FWD	88009	89159	1150 MU-30	87868 fruR	fruR	88028	160
TU-0060	FWD	88009	89159	1150 MU-30	87969 fruR	fruR	88028	59
TU-0061	FWD	89634	107459	17825 MU-31;MU-32;MU-33;MU-34;MU-35;MU-36;MU-37;MU-38;MU-39	89589 mraZ;mraW;ftsL;ftsI;murE;murF;mraY;murD;ftsW;murG;murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	mraZ	89634	45
TU-0062	FWD	89959	107459	17500 MU-32;MU-33;MU-34;MU-35;MU-36;MU-37;MU-38;MU-39	89954 mraW;ftsL;ftsI;murE;murF;mraY;murD;ftsW;murG;murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	mraW	90094	140
TU-0063	FWD	89959	107459	17500 MU-32;MU-33;MU-34;MU-35;MU-36;MU-37;MU-38;MU-39	90014 mraW;ftsL;ftsI;murE;murF;mraY;murD;ftsW;murG;murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	mraW	90094	80
TU-0064	FWD	90334	107459	17125 MU-33;MU-34;MU-35;MU-36;MU-37;MU-38;MU-39	90327 ftsL;ftsI;murE;murF;mraY;murD;ftsW;murG;murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	ftsL	91032	705
TU-0065	FWD	90709	107459	16750 MU-34;MU-35;MU-36;MU-37;MU-38;MU-39	90682 ftsL;ftsI;murE;murF;mraY;murD;ftsW;murG;murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	ftsL	91032	350
TU-0066	FWD	90709	107459	16750 MU-34;MU-35;MU-36;MU-37;MU-38;MU-39	91028 ftsL;ftsI;murE;murF;mraY;murD;ftsW;murG;murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	ftsL	91032	4
TU-0067	FWD	93134	107459	14325 MU-35;MU-36;MU-37;MU-38;MU-39	93137 murE;murF;mraY;murD;ftsW;murG;murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	murE	93166	29
TU-0068	FWD	93134	107459	14325 MU-35;MU-36;MU-37;MU-38;MU-39	93145 murE;murF;mraY;murD;ftsW;murG;murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	murE	93166	21
TU-0069	FWD	100784	107459	6675 MU-36;MU-37;MU-38;MU-39	100740 murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	murC	100765	25
TU-0070	FWD	100784	107459	6675 MU-36;MU-37;MU-38;MU-39	100750 murC;ddlB;ftsQ;ftsA;ftsZ;lpxC	murC	100765	15
TU-0071	FWD	102784	107459	4675 MU-37;MU-38;MU-39	102763 ftsQ;ftsA;ftsZ;lpxC	ftsQ	103155	392
TU-0072	FWD	104609	107459	2850 MU-38;MU-39	104560 ftsZ;lpxC	ftsZ	105305	745
TU-0073	FWD	106509	107459	950 MU-39	106507 lpxC	lpxC	106557	50
TU-0074	FWD	106509	107459	950 MU-39	106519 lpxC	lpxC	106557	38
TU-0075	FWD	106509	107459	950 MU-39	106530 lpxC	lpxC	106557	27
TU-0076	FWD	107709	107984	275 MU-40	107561 secM;secA;mutT	secM	107705	144
TU-0077	FWD	108009	111584	3575 MU-41	107977 secA;mutT	secA	108279	302
TU-0078	FWD	108009	111584	3575 MU-41	108025 secA;mutT	secA	108279	254
TU-0079	FWD	108009	111584	3575 MU-41	108119 secA;mutT	secA	108279	160
TU-0080	FWD	108009	111584	3575 MU-41	108132 secA;mutT	secA	108279	147
TU-0081	FWD	113409	114484	1075 MU-42	113396 guaC	guaC	113444	48
TU-0082	FWD	113409	114484	1075 MU-42	113415 guaC	guaC	113444	29

TU-0083	FWD	113409	114484	1075 MU-42	113436 guaC	guaC	113444	8
TU-0084	FWD	118734	120209	1475 MU-43	118701 ampD;ampE	ampD	118733	32
TU-0085	FWD	118734	120209	1475 MU-43	118918 ampD;ampE	ampD	118733	-185
TU-0086	FWD	122063	127588	5525 MU-44;MU-45	122034 pdhR;aceE;aceF;lpd	pdhR	122092	58
TU-0087	FWD	122988	127588	4600 MU-45	122852 aceE;aceF;lpd	aceE	123017	165
TU-0088	FWD	122988	127588	4600 MU-45	122860 aceE;aceF;lpd	aceE	123017	157
TU-0089	FWD	122988	127588	4600 MU-45	122969 aceE;aceF;lpd	aceE	123017	48
TU-0090	FWD	122988	127588	4600 MU-45	122975 aceE;aceF;lpd	aceE	123017	42
TU-0091	FWD	122988	127588	4600 MU-45	122985 aceE;aceF;lpd	aceE	123017	32
TU-0092	FWD	122988	127588	4600 MU-45	122992 aceE;aceF;lpd	aceE	123017	25
TU-0093	FWD	122988	127588	4600 MU-45	123003 aceE;aceF;lpd	aceE	123017	14
TU-0094	FWD	127638	129321	1683 MU-46	127700 lpd	lpd	127912	212
TU-0095	FWD	127638	129321	1683 MU-46	127717 lpd	lpd	127912	195
TU-0096	FWD	129571	129596	25 MU-47	129500 NT			
TU-0097	FWD	130246	130671	425 MU-48	130202 NT			
TU-0098	FWD	131546	134246	2700 MU-49	131519 acnB	acnB	131615	96
TU-0099	FWD	131546	134246	2700 MU-49	131743 acnB	acnB	131615	-128
TU-0100	FWD	134346	134821	475 MU-50	134339 yacl	yacl	134388	49
TU-0101	FWD	137071	138596	1525 MU-51	137044 cueO	cueO	137083	39
TU-0102	FWD	137071	138596	1525 MU-51	137049 cueO	cueO	137083	34
TU-0103	FWD	141371	142596	1225 MU-52	141360 hpt	hpt	141431	71
TU-0104	FWD	141371	142596	1225 MU-52	141407 hpt	hpt	141431	24
TU-0105	FWD	142646	144946	2300 MU-53	142733 yadG;yadH;yadI	yadG	142779	46
TU-0106	FWD	145071	146250	1179 MU-54	145108 yadE	yadE	145081	-27
TU-0107	FWD	146968	147870	902 MU-55	yadD	yadD	146968	
TU-0108	FWD	147600	147825	225 MU-56	147583 NT			
TU-0109	FWD	147600	147825	225 MU-56	147647 NT			
TU-0110	FWD	162101	164526	2425 MU-57	162077 hrpB	hrpB	162105	28
TU-0111	FWD	164601	167226	2625 MU-58	164648 mrcB	mrcB	164730	82
TU-0112	FWD	164601	167226	2625 MU-58	164658 mrcB	mrcB	164730	72
TU-0113	FWD	167451	173576	6125 MU-59;MU-60	167427 fhuA;fhuC;fhuD;fhuB	fhuA	167484	57
TU-0114	FWD	167451	173576	6125 MU-59;MU-60	167443 fhuA;fhuC;fhuD;fhuB	fhuA	167484	41
TU-0115	FWD	169776	173576	3800 MU-60	169728 fhuC;fhuD;fhuB	fhuC	169778	50
TU-0116	FWD	169776	173576	3800 MU-60	169733 fhuC;fhuD;fhuB	fhuC	169778	45
TU-0117	FWD	174951	176576	1625 MU-61	174931 clcA	clcA	175107	176
TU-0118	FWD	174951	176576	1625 MU-61	174975 clcA	clcA	175107	132
TU-0119	FWD	174951	176576	1625 MU-61	175009 clcA	clcA	175107	98
TU-0120	FWD	174951	176576	1625 MU-61	175074 clcA	clcA	175107	33
TU-0121	FWD	176601	177051	450 MU-62	176558 erpA	erpA	176610	52
TU-0122	FWD	176601	177051	450 MU-62	176561 erpA	erpA	176610	49
TU-0123	FWD	176601	177051	450 MU-62	176583 erpA	erpA	176610	27
TU-0124	FWD	176601	177051	450 MU-62	176592 erpA	erpA	176610	18
TU-0125	FWD	179226	180582	1356 MU-63	179264 dgt	dgt	179237	-27
TU-0126	FWD	180882	183582	2700 MU-64	180852 degP;cdaR	degP	180884	32
TU-0127	FWD	180882	183582	2700 MU-64	180859 degP;cdaR	degP	180884	25
TU-0128	FWD	186157	186832	675 MU-65	186142 NT			

TU-0129	FWD	189607	189757	150 MU-66	189639 tff	tff	189712	73
TU-0130	FWD	189807	191707	1900 MU-67	189842 rpsB;tsf	rpsB	189874	32
TU-0131	FWD	189807	191707	1900 MU-67	189866 rpsB;tsf	rpsB	189874	8
TU-0132	FWD	191757	192732	975 MU-68	191754 pyrH	pyrH	191855	101
TU-0133	FWD	191757	192732	975 MU-68	191812 pyrH	pyrH	191855	43
TU-0134	FWD	191757	192732	975 MU-68	191820 pyrH	pyrH	191855	35
TU-0135	FWD	192757	194532	1775 MU-69	192617 frr;dxr	frr	192872	255
TU-0136	FWD	192757	194532	1775 MU-69	192666 frr;dxr	frr	192872	206
TU-0137	FWD	192757	194532	1775 MU-69	192790 frr;dxr	frr	192872	82
TU-0138	FWD	192757	194532	1775 MU-69	192797 frr;dxr	frr	192872	75
TU-0139	FWD	192757	194532	1775 MU-69	192814 frr;dxr	frr	192872	58
TU-0140	FWD	192757	194532	1775 MU-69	192854 frr;dxr	frr	192872	18
TU-0141	FWD	192757	194532	1775 MU-69	192863 frr;dxr	frr	192872	9
TU-0142	FWD	194632	196532	1900 MU-70	194843 ispU;cdsA	ispU	194903	60
TU-0143	FWD	196557	200257	3700 MU-71;MU-72	196415 rseP;bamA	rseP	196546	131
TU-0144	FWD	196557	200257	3700 MU-71;MU-72	196429 rseP;bamA	rseP	196546	117
TU-0145	FWD	197907	200257	2350 MU-72	197823 bamA	bamA	197928	105
TU-0146	FWD	197907	200257	2350 MU-72	197883 bamA	bamA	197928	45
TU-0147	FWD	200282	202007	1725 MU-73	200138 skp;lpxD	skp	200482	344
TU-0148	FWD	200282	202007	1725 MU-73	200212 skp;lpxD	skp	200482	270
TU-0149	FWD	200282	202007	1725 MU-73	200256 skp;lpxD	skp	200482	226
TU-0150	FWD	200282	202007	1725 MU-73	200299 skp;lpxD	skp	200482	183
TU-0151	FWD	200282	202007	1725 MU-73	200305 skp;lpxD	skp	200482	177
TU-0152	FWD	200282	202007	1725 MU-73	200317 skp;lpxD	skp	200482	165
TU-0153	FWD	200282	202007	1725 MU-73	200378 skp;lpxD	skp	200482	104
TU-0154	FWD	200282	202007	1725 MU-73	200387 skp;lpxD	skp	200482	95
TU-0155	FWD	200282	202007	1725 MU-73	200399 skp;lpxD	skp	200482	83
TU-0156	FWD	202032	208407	6375 MU-74	202019 fabZ;lpxA;lpxB;rnhB;dnaE	fabZ	202101	82
TU-0157	FWD	202032	208407	6375 MU-74	202066 fabZ;lpxA;lpxB;rnhB;dnaE	fabZ	202101	35
TU-0158	FWD	202032	208407	6375 MU-74	202074 fabZ;lpxA;lpxB;rnhB;dnaE	fabZ	202101	27
TU-0159	FWD	202032	208407	6375 MU-74	202082 fabZ;lpxA;lpxB;rnhB;dnaE	fabZ	202101	19
TU-0160	FWD	208432	209582	1150 MU-75	208412 accA	accA	208621	209
TU-0161	FWD	209682	211757	2075 MU-76	209658 ldcC	ldcC	209679	21
TU-0162	FWD	211782	213682	1900 MU-77	211858 yaeR;tilS	yaeR	211877	19
TU-0163	FWD	214307	216107	1800 MU-78;MU-79	214269 yaeQ;yaeJ;nlpE	yaeQ	214291	22
TU-0164	FWD	214307	216107	1800 MU-78;MU-79	214284 yaeQ;yaeJ;nlpE	yaeQ	214291	7
TU-0165	FWD	215332	216107	775 MU-79	215123 nlpE	nlpE	215269	146
TU-0166	FWD	222832	223707	875 MU-80	222806 gmhB	gmhB	222833	27
TU-0167	FWD	223732	225607	1875 MU-81	223771 rrsH;ileV;alaV	rrsH	223771	0
TU-0168	FWD	225632	229012	3380 MU-82	225711 rrlH;rrfH;aspU	rrlH	225759	48
TU-0169	FWD	229162	229862	700 MU-83	229134 dkgB	dkgB	229167	33
TU-0170	FWD	231087	232587	1500 MU-84	231063 yafD;yafE	yafD	231122	59
TU-0171	FWD	234813	235463	650 MU-85	234785 yafS	yafS	234816	31
TU-0172	FWD	235963	236888	925 MU-86	236021 dnaQ	dnaQ	236067	46
TU-0173	FWD	236938	237038	100 MU-87	236861 aspV	aspV	236931	70
TU-0174	FWD	237335	238120	785 MU-88	yafT	yafT	237335	

TU-0175	FWD	238462	238586	124 MU-89	C0067	C0067	238462	
TU-0176	FWD	239106	239378	272 MU-90	yafF	yafF	239106	
TU-0177	FWD	240338	240813	475 MU-91	240333 ivy	ivy	240343	10
TU-0178	FWD	243488	245313	1825 MU-92	243512 lpcA;yafJ	lpcA	243543	31
TU-0179	FWD	243488	245313	1825 MU-92	243522 lpcA;yafJ	lpcA	243543	21
TU-0180	FWD	246688	248038	1350 MU-93	246656 yafL;yafM	yafL	246712	56
TU-0181	FWD	248138	248338	200 MU-94	248128 NT			
TU-0182	FWD	250538	250788	250 MU-95	250492 lafU	lafU	250072	-420
TU-0183	FWD	250863	251838	975 MU-96	250883 dinB	dinB	250898	15
TU-0184	FWD	251913	252813	900 MU-97	251969 yafN;yafO;yafP	yafN	252005	36
TU-0185	FWD	252709	253161	452 MU-98	yafP	yafP	252709	
TU-0186	FWD	253363	253463	100 MU-99	253336 NT			
TU-0187	FWD	253479	253685	206 MU-100	ykfJ	ykfJ	253479	
TU-0188	FWD	253702	254202	500 MU-101	prfH	prfH	253702	
TU-0189	FWD	255938	256438	500 MU-102	255918 gpt	gpt	255977	59
TU-0190	FWD	255938	256438	500 MU-102	255924 gpt	gpt	255977	53
TU-0191	FWD	255938	256438	500 MU-102	255936 gpt	gpt	255977	41
TU-0192	FWD	256513	257788	1275 MU-103	256502 frsA	frsA	256527	25
TU-0193	FWD	256513	257788	1275 MU-103	256509 frsA	frsA	256527	18
TU-0194	FWD	257813	258388	575 MU-104	257810 crl	crl	257829	19
TU-0195	FWD	259489	261989	2500 MU-105	259572 proB;proA	proB	259612	40
TU-0196	FWD	259489	261989	2500 MU-105	259576 proB;proA	proB	259612	36
TU-0197	FWD	259489	261989	2500 MU-105	259584 proB;proA	proB	259612	28
TU-0198	FWD	262089	262214	125 MU-106	262064 thrW	thrW	262095	31
TU-0199	FWD	262089	262214	125 MU-106	262114 thrW	thrW	262095	-19
TU-0200	FWD	268364	268539	175 MU-107	268350 NT			
TU-0201	FWD	269514	272564	3050 MU-108;MU-109	269482 insN;insI;insN	insN	269502	20
TU-0202	FWD	270864	272564	1700 MU-109	270974 insN	insN	270988	14
TU-0203	FWD	270864	272564	1700 MU-109	270979 insN	insN	270988	9
TU-0204	FWD	274539	277114	2575 MU-110	274508 mmuP;mmuM	mmuP	274549	41
TU-0205	FWD	278414	279314	900 MU-111	NT			
TU-0206	FWD	281481	287623	6142 MU-112	yagE;yagF;yagG;yagH	yagE	281481	
TU-0207	FWD	289715	290040	325 MU-113	289619 NT			
TU-0208	FWD	290065	290590	525 MU-114	NT			
TU-0209	FWD	290765	291390	625 MU-115	290751 yagJ	yagJ	290724	-27
TU-0210	FWD	294940	295365	425 MU-116	294852 NT			
TU-0211	FWD	296365	296940	575 MU-117	296384 ptwF	ptwF	296430	46
TU-0212	FWD	302165	303140	975 MU-118	302181 yagU	yagU	302215	34
TU-0213	FWD	302165	303140	975 MU-118	302183 yagU	yagU	302215	32
TU-0214	FWD	311336	311563	227 MU-119	ykgL	ykgL	311336	
TU-0215	FWD	312068	312193	125 MU-120	312032 NT			
TU-0216	FWD	313581	314452	871 MU-121	eaeH	eaeH	313581	
TU-0217	FWD	314493	315693	1200 MU-122	insE;insF	insE	314506	
TU-0218	FWD	316663	316791	128 MU-123	ykgQ	ykgQ	316663	
TU-0219	FWD	319468	319743	275 MU-124	319342 ykgD	ykgD	319451	109
TU-0220	FWD	319468	319743	275 MU-124	319351 ykgD	ykgD	319451	100

TU-0221	FWD	320818	323868	3050 MU-125	320708 ykgE;ykgF;ykgG	ykgE	320832	124
TU-0222	FWD	328693	330368	1675 MU-126	328645 betT	betT	328687	42
TU-0223	FWD	330393	330768	375 MU-127	330428 NT			
TU-0224	FWD	331293	332618	1325 MU-128	331089 yahA	yahA	331595	506
TU-0225	FWD	331293	332618	1325 MU-128	331266 yahA	yahA	331595	329
TU-0226	FWD	331293	332618	1325 MU-128	331462 yahA	yahA	331595	133
TU-0227	FWD	331293	332618	1325 MU-128	331470 yahA	yahA	331595	125
TU-0228	FWD	334943	338943	4000 MU-129	334399 yahD;yahE;yahF;yahG	yahD	334504	105
TU-0229	FWD	334943	338943	4000 MU-129	334470 yahD;yahE;yahF;yahG	yahD	334504	34
TU-0230	FWD	339218	341793	2575 MU-130;MU-131	339162 yahI;yahJ	yahI	339389	227
TU-0231	FWD	340368	341793	1425 MU-131	340325 yahJ	yahJ	340349	24
TU-0232	FWD	341968	343143	1175 MU-132	342042 yahK	yahK	342108	66
TU-0233	FWD	341968	343143	1175 MU-132	342062 yahK	yahK	342108	46
TU-0234	FWD	341968	343143	1175 MU-132	342079 yahK	yahK	342108	29
TU-0235	FWD	343400	344215	815 MU-133	yahL	yahL	343400	
TU-0236	FWD	344493	344643	150 MU-134	344602 NT			
TU-0237	FWD	344628	344873	245 MU-135	yahM	yahM	344628	
TU-0238	FWD	345668	346043	375 MU-136	345656 yahO	yahO	345708	52
TU-0239	FWD	345668	346043	375 MU-136	345664 yahO	yahO	345708	44
TU-0240	FWD	345668	346043	375 MU-136	345678 yahO	yahO	345708	30
TU-0241	FWD	347893	353543	5650 MU-137	347871 prpB;prpC;prpD;prpE	prpB	347906	35
TU-0242	FWD	354143	357043	2900 MU-138	354108 codB;codA	codB	354146	38
TU-0243	FWD	354143	357043	2900 MU-138	354119 codB;codA	codB	354146	27
TU-0244	FWD	358023	360370	2347 MU-139	357998 cynT;cynS;cynX	cynT	358023	25
TU-0245	FWD	368052	374027	5975 MU-140	367744 mhpA;mhpB;mhpC;mhpD;mhpF;mhpE	mhpA	367835	91
TU-0246	FWD	374152	375852	1700 MU-141	374107 mhpT	mhpT	374683	576
TU-0247	FWD	375977	376952	975 MU-142	375966 yaiL	yaiL	375996	30
TU-0248	FWD	375977	376952	975 MU-142	375971 yaiL	yaiL	375996	25
TU-0249	FWD	380506	381781	1275 MU-143	insC;insD	insC	380575	
TU-0250	FWD	382156	382581	425 MU-144	382126 NT			
TU-0251	FWD	384456	387831	3375 MU-145	384430 tauA;tauB;tauC;tauD	tauA	384456	26
TU-0252	FWD	389475	390932	1457 MU-146	389071 yaiT	yaiT	389475	404
TU-0253	FWD	390961	391361	400 MU-147	NT			
TU-0254	FWD	389475	394353	4878 MU-148	yaiT;yaiV	yaiT	389475	
TU-0255	FWD	395536	396775	1239 MU-149	395657 sbmA	sbmA	395863	206
TU-0256	FWD	395536	396775	1239 MU-149	395704 sbmA	sbmA	395863	159
TU-0257	FWD	395536	396775	1239 MU-149	395779 sbmA	sbmA	395863	84
TU-0258	FWD	396875	398179	1304 MU-150	396858 yaiW	yaiW	397096	238
TU-0259	FWD	398804	399379	575 MU-151	398796 yaiZ	yaiZ	398817	21
TU-0260	FWD	400579	400954	375 MU-152	400543 iraP	iraP	400610	67
TU-0261	FWD	400579	400954	375 MU-152	400587 iraP	iraP	400610	23
TU-0262	FWD	400979	402829	1850 MU-153	400875 phoA;psiF	phoA	400971	96
TU-0263	FWD	400979	402829	1850 MU-153	400902 phoA;psiF	phoA	400971	69
TU-0264	FWD	400979	402829	1850 MU-153	400916 phoA;psiF	phoA	400971	55
TU-0265	FWD	402980	404030	1050 MU-154	402912 adrA	adrA	402927	15
TU-0266	FWD	405005	405455	450 MU-155	404965 yaiI	yaiI	404988	23

TU-0267	FWD	405530	406530	1000 MU-156;MU-157	405456 aroL;yaiA;aroM	aroL	405629	173
TU-0268	FWD	405530	406530	1000 MU-156;MU-157	405502 aroL;yaiA;aroM	aroL	405629	127
TU-0269	FWD	406205	407380	1175 MU-157;MU-158	406176 yaiA;aroM	yaiA	406203	27
TU-0270	FWD	406555	407380	825 MU-158	406399 aroM	aroM	406652	253
TU-0271	FWD	407405	407680	275 MU-159	407371 yaiE	yaiE	407401	30
TU-0272	FWD	407780	408280	500 MU-160	407685 ykiA	ykiA	407893	208
TU-0273	FWD	409305	410605	1300 MU-161	409344 mak	mak	409368	24
TU-0274	FWD	415456	416281	825 MU-162	415429 NT			
TU-0275	FWD	416381	418381	2000 MU-163	416378 phoB;phoR	phoB	416366	-12
TU-0276	FWD	418581	421606	3025 MU-164;MU-165	418645 brnQ;proY	brnQ	418815	170
TU-0277	FWD	418581	421606	3025 MU-164;MU-165	418776 brnQ;proY	brnQ	418815	39
TU-0278	FWD	420206	421606	1400 MU-165	420146 proY	proY	420210	64
TU-0279	FWD	421806	423656	1850 MU-166	421719 malZ	malZ	421739	20
TU-0280	FWD	424231	426056	1825 MU-167	424209 queA;tgt	queA	424235	26
TU-0281	FWD	426081	426481	400 MU-168	425886 NT			
TU-0282	FWD	426081	426481	400 MU-168	425978 NT			
TU-0283	FWD	426081	426481	400 MU-168	426063 NT			
TU-0284	FWD	426081	426481	400 MU-168	426165 NT			
TU-0285	FWD	426531	426831	300 MU-169	426428 yajC;secD;secF	yajC	426511	83
TU-0286	FWD	426531	426831	300 MU-169	426439 yajC;secD;secF	yajC	426511	72
TU-0287	FWD	426531	426831	300 MU-169	426472 yajC;secD;secF	yajC	426511	39
TU-0288	FWD	426859	429709	2850 MU-170	426798 secD;secF	secD	426871	73
TU-0289	FWD	426859	429709	2850 MU-170	426873 secD;secF	secD	426871	-2
TU-0290	FWD	426859	429709	2850 MU-170	426882 secD;secF	secD	426871	-11
TU-0291	FWD	426859	429709	2850 MU-170	426887 secD;secF	secD	426871	-16
TU-0292	FWD	429809	430284	475 MU-171	429809 yajD	yajD	429829	20
TU-0293	FWD	432212	436337	4125 MU-172;MU-173;MU-174	432199 nrdR;ribD;ribE;nusB;thiL;pgpA	nrdR	432226	27
TU-0294	FWD	433737	436337	2600 MU-173;MU-174	433735 ribE;nusB;thiL;pgpA	ribE	433871	136
TU-0295	FWD	433737	436337	2600 MU-173;MU-174	433817 ribE;nusB;thiL;pgpA	ribE	433871	54
TU-0296	FWD	433737	436337	2600 MU-173;MU-174	433820 ribE;nusB;thiL;pgpA	ribE	433871	51
TU-0297	FWD	433737	436337	2600 MU-173;MU-174	433828 ribE;nusB;thiL;pgpA	ribE	433871	43
TU-0298	FWD	435737	436337	600 MU-174	435808 pgpA	pgpA	435813	5
TU-0299	FWD	437412	437687	275 MU-175	437492 NT			
TU-0300	FWD	440712	442212	1500 MU-176	440693 thiI	thiI	440773	80
TU-0301	FWD	443812	444487	675 MU-177	443824 yajQ	yajQ	443907	83
TU-0302	FWD	443812	444487	675 MU-177	443852 yajQ	yajQ	443907	55
TU-0303	FWD	443812	444487	675 MU-177	443861 yajQ	yajQ	443907	46
TU-0304	FWD	443812	444487	675 MU-177	443882 yajQ	yajQ	443907	25
TU-0305	FWD	443812	444487	675 MU-177	443888 yajQ	yajQ	443907	19
TU-0306	FWD	453587	454037	450 MU-178	453575 bolA	bolA	453696	121
TU-0307	FWD	453587	454037	450 MU-178	453607 bolA	bolA	453696	89
TU-0308	FWD	453587	454037	450 MU-178	453649 bolA	bolA	453696	47
TU-0309	FWD	453587	454037	450 MU-178	453658 bolA	bolA	453696	38
TU-0310	FWD	454112	455762	1650 MU-179	454217 tig	tig	454357	140
TU-0311	FWD	454112	455762	1650 MU-179	454228 tig	tig	454357	129
TU-0312	FWD	454112	455762	1650 MU-179	454331 tig	tig	454357	26

TU-0313	FWD	455787	457912	2125 MU-180	455778 clpP;clpX	clpP	455901	123
TU-0314	FWD	455787	457912	2125 MU-180	455801 clpP;clpX	clpP	455901	100
TU-0315	FWD	455787	457912	2125 MU-180	455829 clpP;clpX	clpP	455901	72
TU-0316	FWD	455787	457912	2125 MU-180	455867 clpP;clpX	clpP	455901	34
TU-0317	FWD	455787	457912	2125 MU-180	455873 clpP;clpX	clpP	455901	28
TU-0318	FWD	455787	457912	2125 MU-180	455882 clpP;clpX	clpP	455901	19
TU-0319	FWD	457980	459055	1075 MU-181	457992 lon	lon	458112	120
TU-0320	FWD	457980	459055	1075 MU-181	458039 lon	lon	458112	73
TU-0321	FWD	457980	459055	1075 MU-181	458090 lon	lon	458112	22
TU-0322	FWD	459080	460555	1475 MU-182	459037 NT			
TU-0323	FWD	459080	460555	1475 MU-182	459330 NT			
TU-0324	FWD	459080	460555	1475 MU-182	459337 NT			
TU-0325	FWD	459080	460555	1475 MU-182	459339 NT			
TU-0326	FWD	460580	461005	425 MU-183	460556 hupB	hupB	460675	119
TU-0327	FWD	460580	461005	425 MU-183	460615 hupB	hupB	460675	60
TU-0328	FWD	460580	461005	425 MU-183	460619 hupB	hupB	460675	56
TU-0329	FWD	460580	461005	425 MU-183	460637 hupB	hupB	460675	38
TU-0330	FWD	460580	461005	425 MU-183	460655 hupB	hupB	460675	20
TU-0331	FWD	461030	464005	2975 MU-184	461076 ppiD;ybaV;ybaW	ppiD	461139	63
TU-0332	FWD	466630	467480	850 MU-185	466606 cof	cof	466636	30
TU-0333	FWD	467605	471605	4000 MU-186;MU-187	467581 ybaO;mdlA;mdlB	ybaO	467607	26
TU-0334	FWD	470330	471605	1275 MU-187	mdlB	mdlB	469860	
TU-0335	FWD	471805	473480	1675 MU-188;MU-189	471781 glnK;amtB	glnK	471822	41
TU-0336	FWD	472155	473480	1325 MU-189	472073 amtB	amtB	472190	117
TU-0337	FWD	474555	475155	600 MU-190	474530 ybaY	ybaY	474603	73
TU-0338	FWD	474555	475155	600 MU-190	474538 ybaY	ybaY	474603	65
TU-0339	FWD	475680	475780	100 MU-191	475672 ffs	ffs	475672	0
TU-0340	FWD	475880	476255	375 MU-192	475842 ybaA	ybaA	475896	54
TU-0341	FWD	477905	478980	1075 MU-193	478077 NT			
TU-0342	FWD	484983	485533	550 MU-194	484940 acrR	acrR	484985	45
TU-0343	FWD	485733	489283	3550 MU-195	485713 kefA	kefA	485760	47
TU-0344	FWD	490108	490508	400 MU-196	490082 ybaN	ybaN	490106	24
TU-0345	FWD	490533	491208	675 MU-197	490534 apt	apt	490636	102
TU-0346	FWD	491283	493058	1775 MU-198	491278 dnaX	dnaX	491316	38
TU-0347	FWD	493083	494233	1150 MU-199	493133 ybaB;recR	ybaB	493300	167
TU-0348	FWD	493083	494233	1150 MU-199	493139 ybaB;recR	ybaB	493300	161
TU-0349	FWD	493083	494233	1150 MU-199	493170 ybaB;recR	ybaB	493300	130
TU-0350	FWD	493083	494233	1150 MU-199	493242 ybaB;recR	ybaB	493300	58
TU-0351	FWD	493083	494233	1150 MU-199	493275 ybaB;recR	ybaB	493300	25
TU-0352	FWD	494308	496183	1875 MU-200	494300 htpG	htpG	494344	44
TU-0353	FWD	494308	496183	1875 MU-200	494306 htpG	htpG	494344	38
TU-0354	FWD	494308	496183	1875 MU-200	494314 htpG	htpG	494344	30
TU-0355	FWD	494308	496183	1875 MU-200	494328 htpG	htpG	494344	16
TU-0356	FWD	496383	497183	800 MU-201	496357 adk	adk	496399	42
TU-0357	FWD	497283	498108	825 MU-202	497255 hemH	hemH	497279	24
TU-0358	FWD	499362	500787	1425 MU-203	499323 gsk	gsk	499349	26



TU-0359	FWD	504137	505864	1727 MU-204	504107 ushA	ushA	504138	31
TU-0360	FWD	504137	505864	1727 MU-204	504112 ushA	ushA	504138	26
TU-0361	FWD	506264	506489	225 MU-205	506428 sroB	sroB	506428	0
TU-0362	FWD	507414	508039	625 MU-206	507400 ybaQ	ybaQ	507442	42
TU-0363	FWD	507414	508039	625 MU-206	507406 ybaQ	ybaQ	507442	36
TU-0364	FWD	510814	513114	2300 MU-207	510797 ybaS;ybaT	ybaS	510865	68
TU-0365	FWD	510814	513114	2300 MU-207	510827 ybaS;ybaT	ybaS	510865	38
TU-0366	FWD	513139	513889	750 MU-208	513098 cueR	cueR	513217	119
TU-0367	FWD	515139	516639	1500 MU-209	515116 ybbL;ybbM	ybbL	515143	27
TU-0368	FWD	518414	522014	3600 MU-210	518602 ybbA;ybbP	ybbA	518957	355
TU-0369	FWD	518414	522014	3600 MU-210	518895 ybbA;ybbP	ybbA	518957	62
TU-0370	FWD	522439	526339	3900 MU-211	522451 rhsD	rhsD	522485	34
TU-0371	FWD	526514	527864	1350 MU-212	526780 ybbC;yIbH	ybbC	526805	25
TU-0372	FWD	527864	528354	490 MU-213	ybbD	ybbD	527864	
TU-0373	FWD	528724	528816	92 MU-214	yIbI	yIbI	528724	
TU-0374	FWD	531639	532114	475 MU-215	531614 allA	allA	531675	61
TU-0375	FWD	532214	532864	650 MU-216	532189 allR	allR	532235	46
TU-0376	FWD	532889	533039	150 MU-217	532861 NT			
TU-0377	FWD	532889	533039	150 MU-217	532866 NT			
TU-0378	FWD	534064	534514	450 MU-218	534032 NT			
TU-0379	FWD	533140	542257	9117 MU-219	533001 gcl;hyi;glxR;ybbV;ybbW;allB;ybbY;glxK	gcl	533140	139
TU-0380	FWD	535810	542257	6447 MU-220	535605 glxR;ybbV;ybbW;allB;ybbY;glxK	glxR	535810	205
TU-0381	FWD	536857	542257	5400 MU-221	536895 ybbW;allB;ybbY;glxK	ybbW	536857	-38
TU-0382	FWD	541214	542039	825 MU-222	540988 glxK	glxK	541112	124
TU-0383	FWD	545904	550555	4651 MU-223	fdrA;yIbE;yIbF;ybcF	fdrA	545904	
TU-0384	FWD	553814	555314	1500 MU-224	553800 cysS	cysS	553834	34
TU-0385	FWD	557435	557977	542 MU-225	557392 sfmA	sfmA	557435	43
TU-0386	FWD	558197	561523	3326 MU-226	sfmC;sfmD	sfmC	558197	
TU-0387	FWD	561559	563068	1509 MU-227	sfmH;sfmF	sfmH	561559	
TU-0388	FWD	563939	564139	200 MU-228	563958 argU	argU	563946	-12
TU-0389	FWD	563939	564139	200 MU-228	563959 argU	argU	563946	-13
TU-0390	FWD	565599	565999	400 MU-229	565404 peaD;renD	peaD	565599	195
TU-0391	FWD	566014	567439	1425 MU-230	insE;insF;renD	insE	566056	
TU-0392	FWD	567539	567839	300 MU-231	567514 emrE	emrE	567538	24
TU-0393	FWD	568125	569651	1526 MU-232	ybcK	ybcK	568125	
TU-0394	FWD	570141	571516	1375 MU-233	570094 ybcL;ybcM	ybcL	570116	22
TU-0395	FWD	571591	573093	1502 MU-234	571542 yIcH;ybcN;ninE;ybcO;rusA;yIcG	yIcH	571591	49
TU-0396	FWD	573179	573562	383 MU-235	573132 quuD	quuD	573179	47
TU-0397	FWD	576091	576449	358 MU-236	576081 NT			
TU-0398	FWD	576699	577274	575 MU-237	576504 essD;arrD;rzpD;rzoD	essD	576621	117
TU-0399	FWD	578953	579653	700 MU-238	578930 ybcW	ybcW	579103	173
TU-0400	FWD	578953	579653	700 MU-238	579059 ybcW	ybcW	579103	44
TU-0401	FWD	580057	580885	828 MU-239	nohB;aaaD	nohB	580057	
TU-0402	FWD	580790	581140	350 MU-240	580819 tfaD	tfaD	580883	64
TU-0403	FWD	582176	582358	182 MU-241	tfaX	tfaX	582176	
TU-0404	FWD	582840	583815	975 MU-242	appY	appY	582904	

TU-0405	FWD	585215	585315	100 MU-243	pauD	pauD	585280	
TU-0406	FWD	594823	596196	1373 MU-244	594797 cusC	cusC	594823	26
TU-0407	FWD	596295	600695	4400 MU-245	596325 cusF;cusB;cusA	cusF	596354	29
TU-0408	FWD	601170	602520	1350 MU-246	601152 pheP	pheP	601182	30
TU-0409	FWD	607059	607211	152 MU-247	607066 hokE	hokE	607059	-7
TU-0410	FWD	607245	608545	1300 MU-248	607179 insL	insL	607288	109
TU-0411	FWD	611945	617371	5426 MU-249	611909 fes;ybdZ;entF	fes	612038	129
TU-0412	FWD	617477	618610	1133 MU-250	617410 fepE	fepE	617477	67
TU-0413	FWD	621496	622721	1225 MU-251	621481 entS	entS	621523	42
TU-0414	FWD	621496	622721	1225 MU-251	621483 entS	entS	621523	40
TU-0415	FWD	624096	628971	4875 MU-252	624054 entC;entE;entB;entA;ybdB	entC	624108	54
TU-0416	FWD	629046	631996	2950 MU-253	629079 cstA;ybdD	cstA	629117	38
TU-0417	FWD	629046	631996	2950 MU-253	629088 cstA;ybdD	cstA	629117	29
TU-0418	FWD	629046	631996	2950 MU-253	629096 cstA;ybdD	cstA	629117	21
TU-0419	FWD	632796	634146	1350 MU-254	632780 ybdL	ybdL	632809	29
TU-0420	FWD	632796	634146	1350 MU-254	632789 ybdL	ybdL	632809	20
TU-0421	FWD	637871	640549	2678 MU-255	638054 ahpC;ahpF	ahpC	638168	114
TU-0422	FWD	637871	640549	2678 MU-255	638104 ahpC;ahpF	ahpC	638168	64
TU-0423	FWD	637871	640549	2678 MU-255	638130 ahpC;ahpF	ahpC	638168	38
TU-0424	FWD	637871	640549	2678 MU-255	638144 ahpC;ahpF	ahpC	638168	24
TU-0425	FWD	637871	640549	2678 MU-255	638149 ahpC;ahpF	ahpC	638168	19
TU-0426	FWD	637871	640549	2678 MU-255	638189 ahpC;ahpF	ahpC	638168	-21
TU-0427	FWD	637871	640549	2678 MU-255	638227 ahpC;ahpF	ahpC	638168	-59
TU-0428	FWD	641274	642581	1307 MU-256	641285 ybdR	ybdR	641311	26
TU-0429	FWD	651849	653724	1875 MU-257	651740 dpiB;dpiA	dpiB	651458	-282
TU-0430	FWD	655824	656124	300 MU-258	655710 pagP	pagP	655780	70
TU-0431	FWD	655824	656124	300 MU-258	655753 pagP	pagP	655780	27
TU-0432	FWD	656474	656799	325 MU-259	656473 cspE	cspE	656515	42
TU-0433	FWD	657199	657974	775 MU-260	657187 ybeM	ybeM	657254	67
TU-0434	FWD	658024	658374	350 MU-261	658045 tatE	tatE	658170	125
TU-0435	FWD	663280	663505	225 MU-262	663180 NT			
TU-0436	FWD	663280	663505	225 MU-262	663285 NT			
TU-0437	FWD	674180	674980	800 MU-263	674160 ybeL	ybeL	674241	81
TU-0438	FWD	674180	674980	800 MU-263	674216 ybeL	ybeL	674241	25
TU-0439	FWD	675934	678065	2131 MU-264	ybeR;djlB	ybeR	675934	
TU-0440	FWD	678731	680886	2155 MU-265	678687 ybeU;djlC	ybeU	678731	44
TU-0441	FWD	694330	695630	1300 MU-266	694300 ubiF	ubiF	694324	24
TU-0442	FWD	695830	696655	825 MU-267	695655 NT			
TU-0443	FWD	702680	705055	2375 MU-268	702830 nagE	nagE	703167	337
TU-0444	FWD	702680	705055	2375 MU-268	703063 nagE	nagE	703167	104
TU-0445	FWD	705180	707155	1975 MU-269	705222 glnS	glnS	705316	94
TU-0446	FWD	705180	707155	1975 MU-269	705283 glnS	glnS	705316	33
TU-0447	FWD	705180	707155	1975 MU-269	705286 glnS	glnS	705316	30
TU-0448	FWD	705180	707155	1975 MU-269	705301 glnS	glnS	705316	15
TU-0449	FWD	705180	707155	1975 MU-269	705309 glnS	glnS	705316	7
TU-0450	FWD	707557	709339	1782 MU-270	707487 ybfM;ybfN	ybfM	707557	70

TU-0451	FWD	707557	709339	1782 MU-270	707512 ybfM;ybfN	ybfM	707557	45
TU-0452	FWD	709980	710055	75 MU-271	710000 NT			
TU-0453	FWD	712105	714580	2475 MU-272	712074 seqA;pgm	seqA	712210	136
TU-0454	FWD	712105	714580	2475 MU-272	712139 seqA;pgm	seqA	712210	71
TU-0455	FWD	714635	715129	494 MU-273	714596 ybfP	ybfP	714635	39
TU-0456	FWD	715530	715555	25 MU-274	NT			
TU-0457	FWD	719806	720063	257 MU-275	ybfK	ybfK	719806	
TU-0458	FWD	728255	728655	400 MU-276	728295 ybfA	ybfA	728357	62
TU-0459	FWD	728255	728655	400 MU-276	728306 ybfA	ybfA	728357	51
TU-0460	FWD	728255	728655	400 MU-276	728311 ybfA	ybfA	728357	46
TU-0461	FWD	728755	733180	4425 MU-277	728572 rhsC;ybfB	rhsC	728806	234
TU-0462	FWD	733530	734305	775 MU-278	733014 ybfO	ybfO	733356	342
TU-0463	FWD	733530	734305	775 MU-278	733048 ybfO	ybfO	733356	308
TU-0464	FWD	734505	735655	1150 MU-279	734611 ybfC	ybfC	734873	262
TU-0465	FWD	734505	735655	1150 MU-279	734641 ybfC	ybfC	734873	232
TU-0466	FWD	735668	735922	254 MU-280	ybfQ	ybfQ	735668	
TU-0467	FWD	736048	737184	1136 MU-281	ybfL	ybfL	736048	
TU-0468	FWD	737315	738076	761 MU-282	737286 ybfD	ybfD	737315	29
TU-0469	FWD	738183	740533	2350 MU-283	738203 ybgA;phr	ybgA	738224	21
TU-0470	FWD	741908	746408	4500 MU-284;MU-285	741851 ybgI;ybgJ;ybgK;ybgL;nei	ybgI	742050	199
TU-0471	FWD	741908	746408	4500 MU-284;MU-285	742021 ybgI;ybgJ;ybgK;ybgL;nei	ybgI	742050	29
TU-0472	FWD	744608	746408	1800 MU-285	ybgL;nei	ybgL	744388	
TU-0473	FWD	746833	747633	800 MU-286	NT			
TU-0474	FWD	754158	764658	10500 MU-287;MU-288;MU-289	754178 sdhC;sdhD;sdhA;sdhB;sucA;sucB;sucC;sucD	sdhC	754400	222
TU-0475	FWD	754708	757683	2975 MU-288	754738 sdhA;sdhB	sdhA	755130	392
TU-0476	FWD	754708	757683	2975 MU-288	754745 sdhA;sdhB	sdhA	755130	385
TU-0477	FWD	757758	764658	6900 MU-289	757777 sucA;sucB;sucC;sucD	sucA	757929	152
TU-0478	FWD	757758	764658	6900 MU-289	757802 sucA;sucB;sucC;sucD	sucA	757929	127
TU-0479	FWD	757758	764658	6900 MU-289	757808 sucA;sucB;sucC;sucD	sucA	757929	121
TU-0480	FWD	765558	769633	4075 MU-290	765093 mngA;mngB	mngA	765207	114
TU-0481	FWD	770383	773258	2875 MU-291	770474 cydA;cydB	cydA	770681	207
TU-0482	FWD	770383	773258	2875 MU-291	770487 cydA;cydB	cydA	770681	194
TU-0483	FWD	770383	773258	2875 MU-291	770517 cydA;cydB	cydA	770681	164
TU-0484	FWD	770383	773258	2875 MU-291	770523 cydA;cydB	cydA	770681	158
TU-0485	FWD	770383	773258	2875 MU-291	770603 cydA;cydB	cydA	770681	78
TU-0486	FWD	773283	773583	300 MU-292	773229 ybgT	ybgT	773419	190
TU-0487	FWD	773608	773808	200 MU-293	ybgE	ybgE	773532	
TU-0488	FWD	773958	776708	2750 MU-294	773934 ybgC;tolQ;tolR;tolA	ybgC	773975	41
TU-0489	FWD	776733	779733	3000 MU-295	776788 tolB;pal;ybgF	tolB	776963	175
TU-0490	FWD	776733	779733	3000 MU-295	776892 tolB;pal;ybgF	tolB	776963	71
TU-0491	FWD	776733	779733	3000 MU-295	776907 tolB;pal;ybgF	tolB	776963	56
TU-0492	FWD	779758	780233	475 MU-296	779735 lysT;valT;lysW	lysT	779777	42
TU-0493	FWD	780258	780458	200 MU-297	780263 valZ;lysY	valZ	780291	28
TU-0494	FWD	780483	781033	550 MU-298	780570 lysZ;lysQ	lysZ	780592	22
TU-0495	FWD	781258	782158	900 MU-299	781226 nadA	nadA	781308	82

TU-0496	FWD	781258	782158	900 MU-299	781237 nadA	nadA	781308	71
TU-0497	FWD	781258	782158	900 MU-299	781283 nadA	nadA	781308	25
TU-0498	FWD	782183	783508	1325 MU-300	782246 pnuC	pnuC	782389	143
TU-0499	FWD	782183	783508	1325 MU-300	782268 pnuC	pnuC	782389	121
TU-0500	FWD	784833	786008	1175 MU-301	784815 aroG	aroG	784856	41
TU-0501	FWD	784833	786008	1175 MU-301	784821 aroG	aroG	784856	35
TU-0502	FWD	784833	786008	1175 MU-301	784826 aroG	aroG	784856	30
TU-0503	FWD	784833	786008	1175 MU-301	784830 aroG	aroG	784856	26
TU-0504	FWD	786933	786983	50 MU-302	786750 NT			
TU-0505	FWD	793833	794133	300 MU-303	793974 ybhT	ybhT	793996	22
TU-0506	FWD	794308	796733	2425 MU-304	794219 modA;modB;modC	modA	794312	93
TU-0507	FWD	794308	796733	2425 MU-304	794285 modA;modB;modC	modA	794312	27
TU-0508	FWD	797533	797708	175 MU-305	797506 NT			
TU-0509	FWD	797733	798808	1075 MU-306	797668 pgl	pgl	797809	141
TU-0510	FWD	797733	798808	1075 MU-306	797674 pgl	pgl	797809	135
TU-0511	FWD	797733	798808	1075 MU-306	797680 pgl	pgl	797809	129
TU-0512	FWD	797733	798808	1075 MU-306	797778 pgl	pgl	797809	31
TU-0513	FWD	799982	804987	5005 MU-307	ybhH;ybhI;ybhJ	ybhH	799982	
TU-0514	FWD	808504	812306	3802 MU-308	808524 bioB;bioF;bioC;bioD	bioB	808567	43
TU-0515	FWD	808504	812306	3802 MU-308	808533 bioB;bioF;bioC;bioD	bioB	808567	34
TU-0516	FWD	812531	814913	2382 MU-309	812660 uvrB	uvrB	812749	89
TU-0517	FWD	816090	819040	2950 MU-310;MU-311	816050 moaA;moaB;moaC;moaD;moaE	moaA	816267	217
TU-0518	FWD	816090	819040	2950 MU-310;MU-311	816137 moaA;moaB;moaC;moaD;moaE	moaA	816267	130
TU-0519	FWD	817265	819040	1775 MU-311	817199 moaB;moaC;moaD;moaE	moaB	817278	79
TU-0520	FWD	817265	819040	1775 MU-311	817207 moaB;moaC;moaD;moaE	moaB	817278	71
TU-0521	FWD	817265	819040	1775 MU-311	817223 moaB;moaC;moaD;moaE	moaB	817278	55
TU-0522	FWD	817265	819040	1775 MU-311	817235 moaB;moaC;moaD;moaE	moaB	817278	43
TU-0523	FWD	819115	819815	700 MU-312	819081 ybhL	ybhL	819107	26
TU-0524	FWD	819115	819815	700 MU-312	819090 ybhL	ybhL	819107	17
TU-0525	FWD	820016	820729	713 MU-313	ybhM	ybhM	820016	
TU-0526	FWD	820790	820890	100 MU-314	NT			
TU-0527	FWD	823865	824390	525 MU-315	823826 ybhQ	ybhQ	823853	27
TU-0528	FWD	830040	831590	1550 MU-316	830008 rhIE	rhIE	830095	87
TU-0529	FWD	832290	834290	2000 MU-317	832266 dinG	dinG	832293	27
TU-0530	FWD	832290	834290	2000 MU-317	832278 dinG	dinG	832293	15
TU-0531	FWD	834390	835421	1031 MU-318	834346 ybiB	ybiB	834471	125
TU-0532	FWD	834390	835421	1031 MU-318	834393 ybiB	ybiB	834471	78
TU-0533	FWD	834390	835421	1031 MU-318	834404 ybiB	ybiB	834471	67
TU-0534	FWD	835571	836821	1250 MU-319	835541 ybiC	ybiC	835574	33
TU-0535	FWD	837821	838296	475 MU-320	837896 NT			
TU-0536	FWD	841546	842446	900 MU-321	841376 rlmF	rlmF	841555	179
TU-0537	FWD	841546	842446	900 MU-321	841479 rlmF	rlmF	841555	76
TU-0538	FWD	841546	842446	900 MU-321	841538 rlmF	rlmF	841555	17
TU-0539	FWD	849322	850197	875 MU-322	849434 ompX	ompX	849673	239
TU-0540	FWD	849322	850197	875 MU-322	849446 ompX	ompX	849673	227
TU-0541	FWD	849322	850197	875 MU-322	849536 ompX	ompX	849673	137

TU-0542	FWD	849322	850197	875 MU-322	849610 ompX	ompX	849673	63
TU-0543	FWD	849322	850197	875 MU-322	849622 ompX	ompX	849673	51
TU-0544	FWD	849322	850197	875 MU-322	849628 ompX	ompX	849673	45
TU-0545	FWD	849322	850197	875 MU-322	849640 ompX	ompX	849673	33
TU-0546	FWD	849322	850197	875 MU-322	849646 ompX	ompX	849673	27
TU-0547	FWD	851894	852163	269 MU-323	yliL	yliL	851894	
TU-0548	FWD	852322	854047	1725 MU-324	852360 mntR;ybiR	mntR	852406	46
TU-0549	FWD	855122	856847	1725 MU-325	855156 ybiT	ybiT	855186	30
TU-0550	FWD	859172	859675	503 MU-326	859050 NT			
TU-0551	FWD	859172	859675	503 MU-326	859134 NT			
TU-0552	FWD	862900	863500	600 MU-327	862837 fsaA	fsaA	862865	28
TU-0553	FWD	865750	872000	6250 MU-328;MU-329	865760 iaaA;gsiA;gsiB;gsiC;gsiD	iaaA	865791	31
TU-0554	FWD	870800	872000	1200 MU-329	870904 gsiD	gsiD	871113	209
TU-0555	FWD	870800	872000	1200 MU-329	870945 gsiD	gsiD	871113	168
TU-0556	FWD	872150	875975	3825 MU-330	872121 yliE;yliF	yliE	872202	81
TU-0557	FWD	872150	875975	3825 MU-330	872128 yliE;yliF	yliE	872202	74
TU-0558	FWD	872150	875975	3825 MU-330	872170 yliE;yliF	yliE	872202	32
TU-0559	FWD	872150	875975	3825 MU-330	872180 yliE;yliF	yliE	872202	22
TU-0560	FWD	877350	877850	500 MU-331	877440 bssR	bssR	877471	31
TU-0561	FWD	877900	878950	1050 MU-332	877945 yliI	yliI	877965	20
TU-0562	FWD	879860	881135	1275 MU-333	879841 dacC	dacC	879950	109
TU-0563	FWD	879860	881135	1275 MU-333	879851 dacC	dacC	879950	99
TU-0564	FWD	879860	881135	1275 MU-333	879858 dacC	dacC	879950	92
TU-0565	FWD	879860	881135	1275 MU-333	879868 dacC	dacC	879950	82
TU-0566	FWD	879860	881135	1275 MU-333	879918 dacC	dacC	879950	32
TU-0567	FWD	882810	884435	1625 MU-334	882793 cmr	cmr	882896	103
TU-0568	FWD	882810	884435	1625 MU-334	882872 cmr	cmr	882896	24
TU-0569	FWD	886685	887185	500 MU-335	886624 ybjK	ybjK	886646	22
TU-0570	FWD	889154	889604	450 MU-336	889111 ybjM	ybjM	889312	201
TU-0571	FWD	890129	892629	2500 MU-337;MU-338;MU-339	890086 ybjC;nfsA;rimK;ybjN	ybjC	890136	50
TU-0572	FWD	891279	892629	1350 MU-338;MU-339	891082 rimK;ybjN	rimK	891190	108
TU-0573	FWD	892104	892629	525 MU-339	892149 ybjN	ybjN	892180	31
TU-0574	FWD	892879	897107	4228 MU-340	892867 potF;potG;potH;potI;ybjO	potF	893007	140
TU-0575	FWD	897232	897657	425 MU-341	ybjO	ybjO	897212	
TU-0576	FWD	897707	898957	1250 MU-342	897617 rumB	rumB	897741	124
TU-0577	FWD	903757	905182	1425 MU-343	903740 ybjQ;amiD	ybjQ	903816	76
TU-0578	FWD	903757	905182	1425 MU-343	903746 ybjQ;amiD	ybjQ	903816	70
TU-0579	FWD	903757	905182	1425 MU-343	903754 ybjQ;amiD	ybjQ	903816	62
TU-0580	FWD	903757	905182	1425 MU-343	903762 ybjQ;amiD	ybjQ	903816	54
TU-0581	FWD	903757	905182	1425 MU-343	903777 ybjQ;amiD	ybjQ	903816	39
TU-0582	FWD	903757	905182	1425 MU-343	903793 ybjQ;amiD	ybjQ	903816	23
TU-0583	FWD	905282	905907	625 MU-344	905279 NT			
TU-0584	FWD	913958	914383	425 MU-345	913951 NT			
TU-0585	FWD	915583	917283	1700 MU-346	915532 ybjD	ybjD	915696	164
TU-0586	FWD	918408	921085	2677 MU-347	918360 macA;macB	macA	918458	98
TU-0587	FWD	918408	921085	2677 MU-347	918396 macA;macB	macA	918458	62

TU-0588	FWD	921135	922060	925 MU-348	921139 NT				
TU-0589	FWD	921135	922060	925 MU-348	921194 NT				
TU-0590	FWD	922085	924898	2813 MU-349	922282 clpS;clpA	clpS	922136	-146	
TU-0591	FWD	922085	924898	2813 MU-349	922314 clpS;clpA	clpS	922136	-178	
TU-0592	FWD	922085	924898	2813 MU-349	922434 clpS;clpA	clpS	922136	-298	
TU-0593	FWD	931584	932409	825 MU-350	931551 lrp	lrp	931818	267	
TU-0594	FWD	931584	932409	825 MU-350	931654 lrp	lrp	931818	164	
TU-0595	FWD	931584	932409	825 MU-350	931799 lrp	lrp	931818	19	
TU-0596	FWD	932434	936484	4050 MU-351	932358 ftsK	ftsK	932447	89	
TU-0597	FWD	932434	936484	4050 MU-351	932404 ftsK	ftsK	932447	43	
TU-0598	FWD	936509	938634	2125 MU-352	936440 lolA;rarA	lolA	936595	155	
TU-0599	FWD	936509	938634	2125 MU-352	936511 lolA;rarA	lolA	936595	84	
TU-0600	FWD	936509	938634	2125 MU-352	936551 lolA;rarA	lolA	936595	44	
TU-0601	FWD	938659	939934	1275 MU-353	938576 serS	serS	938651	75	
TU-0602	FWD	938659	939934	1275 MU-353	938624 serS	serS	938651	27	
TU-0603	FWD	938659	939934	1275 MU-353	938645 serS	serS	938651	6	
TU-0604	FWD	940084	943859	3775 MU-354	940046 dmsA;dmsB;dmsC	dmsA	940182	136	
TU-0605	FWD	940084	943859	3775 MU-354	940082 dmsA;dmsB;dmsC	dmsA	940182	100	
TU-0606	FWD	945084	946059	975 MU-355	945064 ycaD	ycaD	945094	30	
TU-0607	FWD	946084	946234	150 MU-356	946043 NT				
TU-0608	FWD	946084	946234	150 MU-356	946080 NT				
TU-0609	FWD	946452	947882	1430 MU-357	ycaM	ycaM	946452		
TU-0610	FWD	948909	949484	575 MU-358	948867 ycaK	ycaK	948891	24	
TU-0611	FWD	955961	956786	825 MU-359	955897 ycaP	ycaP	955985	88	
TU-0612	FWD	956836	959336	2500 MU-360	956802 serC;aroA	serC	956876	74	
TU-0613	FWD	956836	959336	2500 MU-360	956808 serC;aroA	serC	956876	68	
TU-0614	FWD	959636	960161	525 MU-361	959494 ycaL	ycaL	959487	-7	
TU-0615	FWD	960361	960911	550 MU-362	960303 cmk	cmk	960424	121	
TU-0616	FWD	960361	960911	550 MU-362	960386 cmk	cmk	960424	38	
TU-0617	FWD	960361	960911	550 MU-362	960408 cmk	cmk	960424	16	
TU-0618	FWD	960936	963011	2075 MU-363	960944 rpsA	rpsA	961218	274	
TU-0619	FWD	960936	963011	2075 MU-363	961060 rpsA	rpsA	961218	158	
TU-0620	FWD	960936	963011	2075 MU-363	961116 rpsA	rpsA	961218	102	
TU-0621	FWD	963036	963336	300 MU-364	962867 ihfB	ihfB	963051	184	
TU-0622	FWD	963561	965037	1476 MU-365	963495 ycaI	ycaI	963543	48	
TU-0623	FWD	965837	969337	3500 MU-366	965817 msbA;lpxK;ycaQ	msbA	965844	27	
TU-0624	FWD	969887	970737	850 MU-367	969867 ycaR;kdsB	ycaR	969896	29	
TU-0625	FWD	970962	971887	925 MU-368	970942 ycbJ	ycbJ	970975	33	
TU-0626	FWD	972737	979937	7200 MU-369	972720 smtA;mukF;mukE;mukB	smtA	972760	40	
TU-0627	FWD	980187	982112	1925 MU-370	980154 ycbB	ycbB	980270	116	
TU-0628	FWD	980187	982112	1925 MU-370	980247 ycbB	ycbB	980270	23	
TU-0629	FWD	982137	983687	1550 MU-371;MU-372	982054 ycbK;ycbL	ycbK	982298	244	
TU-0630	FWD	982137	983687	1550 MU-371;MU-372	982102 ycbK;ycbL	ycbK	982298	196	
TU-0631	FWD	982862	983687	825 MU-372	982798 ycbL	ycbL	982873	75	
TU-0632	FWD	985188	985413	225 MU-373	985190 NT				
TU-0633	FWD	986467	986967	500 MU-374	986622 NT				

TU-0634	FWD	989717	992442	2725 MU-375	989737 pepN	pepN	989845	108
TU-0635	FWD	989717	992442	2725 MU-375	989749 pepN	pepN	989845	96
TU-0636	FWD	989717	992442	2725 MU-375	989815 pepN	pepN	989845	30
TU-0637	FWD	997091	1003880	6789 MU-376	ycbQ;ycbR;ycbS;ycbT;ycbU;ycbV;ycbF	ycbQ	997091	
TU-0638	FWD	1003968	1004993	1025 MU-377	1003961 pyrD	pyrD	1003991	30
TU-0639	FWD	1005068	1005793	725 MU-378	1005076 ycbW	ycbW	1005175	99
TU-0640	FWD	1006918	1010893	3975 MU-379	1006895 rlmL;uup	rlmL	1007067	172
TU-0641	FWD	1006918	1010893	3975 MU-379	1006926 rlmL;uup	rlmL	1007067	141
TU-0642	FWD	1006918	1010893	3975 MU-379	1006929 rlmL;uup	rlmL	1007067	138
TU-0643	FWD	1006918	1010893	3975 MU-379	1007025 rlmL;uup	rlmL	1007067	42
TU-0644	FWD	1010918	1014643	3725 MU-380	1010883 pqiA;pqiB;ymbA	pqiA	1011224	341
TU-0645	FWD	1010918	1014643	3725 MU-380	1010988 pqiA;pqiB;ymbA	pqiA	1011224	236
TU-0646	FWD	1014793	1015293	500 MU-381	1014873 rmf	rmf	1014938	65
TU-0647	FWD	1014793	1015293	500 MU-381	1014882 rmf	rmf	1014938	56
TU-0648	FWD	1014793	1015293	500 MU-381	1014905 rmf	rmf	1014938	33
TU-0649	FWD	1017718	1018143	425 MU-382	1017682 ycbG	ycbG	1017708	26
TU-0650	FWD	1019543	1020118	575 MU-383	1019566 NT			
TU-0651	FWD	1020368	1021018	650 MU-384	1020306 sxy	sxy	1020361	55
TU-0652	FWD	1023693	1025743	2050 MU-385	1023665 helD	helD	1023694	29
TU-0653	FWD	1026993	1027661	668 MU-386	1027106 yccU	yccU	1027169	63
TU-0654	FWD	1026993	1027661	668 MU-386	1027150 yccU	yccU	1027169	19
TU-0655	FWD	1029186	1029737	551 MU-387	1029195 yccX	yccX	1029287	92
TU-0656	FWD	1029186	1029737	551 MU-387	1029201 yccX	yccX	1029287	86
TU-0657	FWD	1030712	1030787	75 MU-388	1030656 NT			
TU-0658	FWD	1031212	1036362	5150 MU-389	1031208 hyaA;hyaB;hyaC;hyaD;hyaE;hyaF	hyaA	1031362	154
TU-0659	FWD	1036962	1041237	4275 MU-390;MU-391	1036930 appC;appB;yccB;appA	appC	1036963	33
TU-0660	FWD	1039862	1041237	1375 MU-391	1039819 appA	appA	1039840	21
TU-0661	FWD	1049037	1049937	900 MU-392	1049039 insA;insB	insA	1049056	17
TU-0662	FWD	1050684	1050896	212 MU-393	1050625 cspG	cspG	1050684	59
TU-0663	FWD	1051070	1051300	230 MU-394	ymcE	ymcE	1051070	
TU-0664	FWD	1051237	1051562	325 MU-395	1051218 gnsA	gnsA	1051290	72
TU-0665	FWD	1055512	1056287	775 MU-396	torT	torT	1055484	
TU-0666	FWD	1057487	1061362	3875 MU-397;MU-398	1057130 torC;torA;torD	torC	1057307	177
TU-0667	FWD	1060837	1061362	525 MU-398	1060747 torD	torD	1061022	275
TU-0668	FWD	1063259	1064515	1256 MU-399	1063246 yccE	yccE	1063259	13
TU-0669	FWD	1064812	1066037	1225 MU-400	1064782 agp	agp	1064808	26
TU-0670	FWD	1067262	1067687	425 MU-401	1067262 ymdF	ymdF	1067304	42
TU-0671	FWD	1073387	1074087	700 MU-402	1073321 rutR	rutR	1073465	144
TU-0672	FWD	1073387	1074087	700 MU-402	1073443 rutR	rutR	1073465	22
TU-0673	FWD	1078312	1080287	1975 MU-403	1078392 putP	putP	1078528	136
TU-0674	FWD	1078312	1080287	1975 MU-403	1078447 putP	putP	1078528	81
TU-0675	FWD	1078312	1080287	1975 MU-403	1078512 putP	putP	1078528	16
TU-0676	FWD	1080537	1083912	3375 MU-404	1080520 efeU;efeO;efeB	efeU	1080579	59
TU-0677	FWD	1080537	1083912	3375 MU-404	1080533 efeU;efeO;efeB	efeU	1080579	46
TU-0678	FWD	1084187	1085287	1100 MU-405	1084120 phoH	phoH	1084215	95
TU-0679	FWD	1084187	1085287	1100 MU-405	1084166 phoH	phoH	1084215	49

TU-0680	FWD	1092112	1093162	1050 MU-406	1092062 ycdT	ycdT	1092099	37
TU-0681	FWD	1092112	1093162	1050 MU-406	1092067 ycdT	ycdT	1092099	32
TU-0682	FWD	1093412	1093887	475 MU-407	1093229 NT			
TU-0683	FWD	1094728	1095069	341 MU-408	ymdE	ymdE	1094728	
TU-0684	FWD	1095066	1096052	986 MU-409	ycdU	ycdU	1095066	
TU-0685	FWD	1097012	1099412	2400 MU-410;MU-411	1096981 ghrA;ycdX;ycdY	ghrA	1097109	128
TU-0686	FWD	1097012	1099412	2400 MU-410;MU-411	1096990 ghrA;ycdX;ycdY	ghrA	1097109	119
TU-0687	FWD	1097012	1099412	2400 MU-410;MU-411	1097010 ghrA;ycdX;ycdY	ghrA	1097109	99
TU-0688	FWD	1097012	1099412	2400 MU-410;MU-411	1097049 ghrA;ycdX;ycdY	ghrA	1097109	60
TU-0689	FWD	1097012	1099412	2400 MU-410;MU-411	1097057 ghrA;ycdX;ycdY	ghrA	1097109	52
TU-0690	FWD	1098187	1099412	1225 MU-411	1098081 ycdX;ycdY	ycdX	1098102	21
TU-0691	FWD	1099462	1099987	525 MU-412	1099336 ycdZ	ycdZ	1099519	183
TU-0692	FWD	1099462	1099987	525 MU-412	1099405 ycdZ	ycdZ	1099519	114
TU-0693	FWD	1103174	1104948	1774 MU-413	csgB;csgA;csgC;ymdA	csgB	1103174	
TU-0694	FWD	1103590	1104015	425 MU-414	1103559 csgA	csgA	1103670	111
TU-0695	FWD	1105040	1107190	2150 MU-415	1105020 ymdB;ymdC	ymdB	1105043	23
TU-0696	FWD	1108465	1112740	4275 MU-416	1108478 mdoG;mdoH	mdoG	1108558	80
TU-0697	FWD	1108465	1112740	4275 MU-416	1108501 mdoG;mdoH	mdoG	1108558	57
TU-0698	FWD	1112802	1113029	227 MU-417	yceK	yceK	1112802	
TU-0699	FWD	1116015	1117065	1050 MU-418	1115959 yceA	yceA	1116030	71
TU-0700	FWD	1116015	1117065	1050 MU-418	1115994 yceA	yceA	1116030	36
TU-0701	FWD	1124722	1128573	3851 MU-419;MU-420	1124698 rimJ;yceH;yceM;yceN	rimJ	1124785	87
TU-0702	FWD	1124722	1128573	3851 MU-419;MU-420	1124706 rimJ;yceH;yceM;yceN	rimJ	1124785	79
TU-0703	FWD	1127047	1128573	1526 MU-420	1127058 yceN	yceN	1127062	4
TU-0704	FWD	1130241	1133780	3539 MU-421	1130215 flgB;flgC;flgD;flgE;flgF	flgB	1130241	26
TU-0705	FWD	1130241	1133780	3539 MU-421	1130271 flgB;flgC;flgD;flgE;flgF	flgB	1130241	-30
TU-0706	FWD	1133952	1137535	3583 MU-422	1133923 flgG;flgH;flgI;flgJ	flgG	1133952	29
TU-0707	FWD	1137628	1140103	2475 MU-423	1137576 flgK;flgL	flgK	1137601	25
TU-0708	FWD	1143725	1144045	320 MU-424	yceQ	yceQ	1143725	
TU-0709	FWD	1144129	1145104	975 MU-425	1144163 rluC	rluC	1144163	0
TU-0710	FWD	1145829	1145904	75 MU-426	1145813 psrD	psrD	1145812	-1
TU-0711	FWD	1145929	1146604	675 MU-427	1145871 yceD;rpmF	yceD	1146017	146
TU-0712	FWD	1145929	1146604	675 MU-427	1145942 yceD;rpmF	yceD	1146017	75
TU-0713	FWD	1145929	1146604	675 MU-427	1146015 yceD;rpmF	yceD	1146017	2
TU-0714	FWD	1146629	1146854	225 MU-428	1146523 rpmF;plsX;fabH;fabD;fabG	rpmF	1146590	67
TU-0715	FWD	1146629	1146854	225 MU-428	1146530 rpmF;plsX;fabH;fabD;fabG	rpmF	1146590	60
TU-0716	FWD	1146629	1146854	225 MU-428	1146538 rpmF;plsX;fabH;fabD;fabG	rpmF	1146590	52
TU-0717	FWD	1146629	1146854	225 MU-428	1146573 rpmF;plsX;fabH;fabD;fabG	rpmF	1146590	17
TU-0718	FWD	1146879	1147629	750 MU-429	1146994 rpmF;plsX;fabH;fabD;fabG	rpmF	1146590	-404
TU-0719	FWD	1147654	1150755	3101 MU-430	1147191 fabH;fabD;fabG	fabH	1147982	791
TU-0720	FWD	1147654	1150755	3101 MU-430	1147299 fabH;fabD;fabG	fabH	1147982	683
TU-0721	FWD	1147654	1150755	3101 MU-430	1147410 fabH;fabD;fabG	fabH	1147982	572
TU-0722	FWD	1150780	1151080	300 MU-431	1150734 acpP;fabF	acpP	1150838	104
TU-0723	FWD	1150780	1151080	300 MU-431	1150759 acpP;fabF	acpP	1150838	79
TU-0724	FWD	1150780	1151080	300 MU-431	1150772 acpP;fabF	acpP	1150838	66
TU-0725	FWD	1150780	1151080	300 MU-431	1150783 acpP;fabF	acpP	1150838	55



TU-0726	FWD	1150780	1151080	300 MU-431	1150791 acpP;fabF	acpP	1150838	47
TU-0727	FWD	1150780	1151080	300 MU-431	1150799 acpP;fabF	acpP	1150838	39
TU-0728	FWD	1150780	1151080	300 MU-431	1150828 acpP;fabF	acpP	1150838	10
TU-0729	FWD	1151105	1152380	1275 MU-432	1151079 fabF	fabF	1151162	83
TU-0730	FWD	1151105	1152380	1275 MU-432	1151133 fabF	fabF	1151162	29
TU-0731	FWD	1152530	1156780	4250 MU-433;MU-434	1152502 pabC;yceG;tmk;holB;ycfH	pabC	1152523	21
TU-0732	FWD	1154230	1156780	2550 MU-434	1154242 tmk;holB;ycfH	tmk	1154347	105
TU-0733	FWD	1154230	1156780	2550 MU-434	1154281 tmk;holB;ycfH	tmk	1154347	66
TU-0734	FWD	1156805	1158530	1725 MU-435	1156852 ptsG	ptsG	1157092	240
TU-0735	FWD	1156805	1158530	1725 MU-435	1156960 ptsG	ptsG	1157092	132
TU-0736	FWD	1156805	1158530	1725 MU-435	1156971 ptsG	ptsG	1157092	121
TU-0737	FWD	1156805	1158530	1725 MU-435	1156977 ptsG	ptsG	1157092	115
TU-0738	FWD	1156805	1158530	1725 MU-435	1156990 ptsG	ptsG	1157092	102
TU-0739	FWD	1161055	1164905	3850 MU-436;MU-437;MU-438	1161048 hinT;ycfL;ycfM;thiK;nagZ;ycfP	hinT	1161108	60
TU-0740	FWD	1161055	1164905	3850 MU-436;MU-437;MU-438	1161078 hinT;ycfL;ycfM;thiK;nagZ;ycfP	hinT	1161108	30
TU-0741	FWD	1161055	1164905	3850 MU-436;MU-437;MU-438	1161086 hinT;ycfL;ycfM;thiK;nagZ;ycfP	hinT	1161108	22
TU-0742	FWD	1163055	1164905	1850 MU-437;MU-438	1163108 nagZ;ycfP	nagZ	1163318	210
TU-0743	FWD	1163055	1164905	1850 MU-437;MU-438	1163203 nagZ;ycfP	nagZ	1163318	115
TU-0744	FWD	1164280	1164905	625 MU-438	1164238 ycfP	ycfP	1164366	128
TU-0745	FWD	1165305	1166605	1300 MU-439	1165249 ndh	ndh	1165308	59
TU-0746	FWD	1165305	1166605	1300 MU-439	1165275 ndh	ndh	1165308	33
TU-0747	FWD	1166830	1167355	525 MU-440	1166736 ycfJ	ycfJ	1166822	86
TU-0748	FWD	1168180	1168580	400 MU-441	1168242 bhsA	bhsA	1168296	54
TU-0749	FWD	1174655	1177180	2525 MU-442	1174623 lolC;lolD;lolE	lolC	1174650	27
TU-0750	FWD	1177205	1179705	2500 MU-443	1177461 nagK;cobB	nagK	1177816	355
TU-0751	FWD	1177205	1179705	2500 MU-443	1177640 nagK;cobB	nagK	1177816	176
TU-0752	FWD	1184987	1186362	1375 MU-444	1184963 pepT	pepT	1185067	104
TU-0753	FWD	1184987	1186362	1375 MU-444	1185028 pepT	pepT	1185067	39
TU-0754	FWD	1184987	1186362	1375 MU-444	1185046 pepT	pepT	1185067	21
TU-0755	FWD	1194216	1195901	1685 MU-445	1194184 icd	icd	1194346	162
TU-0756	FWD	1194216	1195901	1685 MU-445	1194193 icd	icd	1194346	153
TU-0757	FWD	1194216	1195901	1685 MU-445	1194231 icd	icd	1194346	115
TU-0758	FWD	1194216	1195901	1685 MU-445	1194325 icd	icd	1194346	21
TU-0759	FWD	1194216	1195901	1685 MU-445	1194242 icd	icd	1194346	104
TU-0760	FWD	1195937	1196009	72 MU-446	C0293	C0293	1195937	
TU-0761	FWD	1197826	1198526	700 MU-447	1197892 lit	lit	1197918	26
TU-0762	FWD	1200701	1201026	325 MU-448	1200691 ymfI	ymfI	1200720	29
TU-0763	FWD	1202247	1206720	4473 MU-449	1202232 ymfT;ymfL;ymfM;ymfN;ymfR;ymfO;ymfP;ymfQ	ymfT	1202247	15
TU-0764	FWD	1206724	1207768	1044 MU-450	ycfK;ymfS	ycfK	1206724	
TU-0765	FWD	1208908	1209462	554 MU-451	pinE	pinE	1208908	
TU-0766	FWD	1209569	1210402	833 MU-452	1209545 mcrA	mcrA	1209569	24
TU-0767	FWD	1210668	1210793	125 MU-453	1210545 icdC	icdC	1210636	91
TU-0768	FWD	1214994	1216319	1325 MU-454	1214975 ycgZ;ymgA;ariR;ymgC	ycgZ	1215012	37
TU-0769	FWD	1214994	1216319	1325 MU-454	1214994 ycgZ;ymgA;ariR;ymgC	ycgZ	1215012	18
TU-0770	FWD	1216519	1217094	575 MU-455	1216355 ycgG	ycgG	1216551	196

TU-0771	FWD	1218206	1218424	218 MU-456	ymgF	ymgF	1218206	
TU-0772	FWD	1219019	1219569	550 MU-457	1218588 ycgH	ycgH	1218824	236
TU-0773	FWD	1219919	1221419	1500 MU-458	1219841 NT			
TU-0774	FWD	1222487	1222672	185 MU-459	ymgJ	ymgJ	1222487	
TU-0775	FWD	1222844	1223094	250 MU-460	1223002 ycgI	ycgI	1222787	-215
TU-0776	FWD	1225744	1226595	851 MU-461	1225704 ycgJ	ycgJ	1225823	119
TU-0777	FWD	1226695	1227945	1250 MU-462	1226908 ycgL;ycgM	ycgL	1226904	-4
TU-0778	FWD	1227970	1228545	575 MU-463	1227925 ycgN	ycgN	1228038	113
TU-0779	FWD	1227970	1228545	575 MU-463	1228020 ycgN	ycgN	1228038	18
TU-0780	FWD	1227970	1228545	575 MU-463	1228027 ycgN	ycgN	1228038	11
TU-0781	FWD	1229920	1232345	2425 MU-464	1230085 C0299;umuD;umuC	C0299	1229852	-233
TU-0782	FWD	1234145	1234870	725 MU-465	1234128 fadR	fadR	1234161	33
TU-0783	FWD	1234145	1234870	725 MU-465	1234136 fadR	fadR	1234161	25
TU-0784	FWD	1236770	1239220	2450 MU-466	1236748 dadA;dadX	dadA	1236794	46
TU-0785	FWD	1236770	1239220	2450 MU-466	1236754 dadA;dadX	dadA	1236794	40
TU-0786	FWD	1236770	1239220	2450 MU-466	1236762 dadA;dadX	dadA	1236794	32
TU-0787	FWD	1241270	1241770	500 MU-467	1241244 NT			
TU-0788	FWD	1242370	1243070	700 MU-468	1242351 emtA	emtA	1242403	52
TU-0789	FWD	1242370	1243070	700 MU-468	1242388 emtA	emtA	1242403	15
TU-0790	FWD	1243920	1244220	300 MU-469	1243901 ymgE	ymgE	1243951	50
TU-0791	FWD	1243920	1244220	300 MU-469	1243934 ymgE	ymgE	1243951	17
TU-0792	FWD	1244270	1244649	379 MU-470	ycgY	ycgY	1244383	
TU-0793	FWD	1250249	1252174	1925 MU-471	1250212 dhaR	dhaR	1250289	77
TU-0794	FWD	1250249	1252174	1925 MU-471	1250224 dhaR	dhaR	1250289	65
TU-0795	FWD	1257924	1258624	700 MU-472	1257889 ychH	ychH	1258014	125
TU-0796	FWD	1257924	1258624	700 MU-472	1257939 ychH	ychH	1258014	75
TU-0797	FWD	1257924	1258624	700 MU-472	1257961 ychH	ychH	1258014	53
TU-0798	FWD	1257924	1258624	700 MU-472	1257999 ychH	ychH	1258014	15
TU-0799	FWD	1262849	1266299	3450 MU-473	1262806 hemA;prfA;prmC;ychQ	hemA	1262937	131
TU-0800	FWD	1262849	1266299	3450 MU-473	1262898 hemA;prfA;prmC;ychQ	hemA	1262937	39
TU-0801	FWD	1266399	1268499	2100 MU-474;MU-475	1266404 ychA;kdsA	ychA	1266543	139
TU-0802	FWD	1266399	1268499	2100 MU-474;MU-475	1266413 ychA;kdsA	ychA	1266543	130
TU-0803	FWD	1267174	1268499	1325 MU-475	1267041 kdsA	kdsA	1267388	347
TU-0804	FWD	1267174	1268499	1325 MU-475	1267079 kdsA	kdsA	1267388	309
TU-0805	FWD	1267174	1268499	1325 MU-475	1267253 kdsA	kdsA	1267388	135
TU-0806	FWD	1267174	1268499	1325 MU-475	1267259 kdsA	kdsA	1267388	129
TU-0807	FWD	1267174	1268499	1325 MU-475	1267374 kdsA	kdsA	1267388	14
TU-0808	FWD	1268546	1268612	66 MU-476	rdIA	rdIA	1268546	
TU-0809	FWD	1269081	1269146	65 MU-477	rdIB	rdIB	1269081	
TU-0810	FWD	1269616	1269683	67 MU-478	rdIC	rdIC	1269616	
TU-0811	FWD	1271274	1271524	250 MU-479	1271318 chaB	chaB	1271342	24
TU-0812	FWD	1271549	1272524	975 MU-480	1271647 chaC	chaC	1271730	83
TU-0813	FWD	1271549	1272524	975 MU-480	1271652 chaC	chaC	1271730	78
TU-0814	FWD	1273000	1274300	1300 MU-481	1272845 ychO	ychO	1273007	162
TU-0815	FWD	1273000	1274300	1300 MU-481	1272970 ychO	ychO	1273007	37
TU-0816	FWD	1273000	1274300	1300 MU-481	1272976 ychO	ychO	1273007	31

TU-0817	FWD	1277200	1278675	1475 MU-482	narK	narK	1277180	
TU-0818	FWD	1277200	1278675	1475 MU-482	narK	narK	1277180	
TU-0819	FWD	1279050	1284550	5500 MU-483	1279048 narG;narH;narJ;narI	narG	1279087	39
TU-0820	FWD	1285932	1286207	275 MU-484	ychS	ychS	1285932	
TU-0821	FWD	1288250	1290600	2350 MU-485;MU-486	1288329 rssA;rssB	rssA	1288429	100
TU-0822	FWD	1288250	1290600	2350 MU-485;MU-486	1288358 rssA;rssB	rssA	1288429	71
TU-0823	FWD	1289375	1290600	1225 MU-486	1289379 rssB	rssB	1289465	86
TU-0824	FWD	1289375	1290600	1225 MU-486	1289443 rssB	rssB	1289465	22
TU-0825	FWD	1290625	1291575	950 MU-487	1290544 galU	galU	1290680	136
TU-0826	FWD	1290625	1291575	950 MU-487	1290550 galU	galU	1290680	130
TU-0827	FWD	1290625	1291575	950 MU-487	1290557 galU	galU	1290680	123
TU-0828	FWD	1290625	1291575	950 MU-487	1290562 galU	galU	1290680	118
TU-0829	FWD	1290625	1291575	950 MU-487	1290568 galU	galU	1290680	112
TU-0830	FWD	1290625	1291575	950 MU-487	1290586 galU	galU	1290680	94
TU-0831	FWD	1290625	1291575	950 MU-487	1290629 galU	galU	1290680	51
TU-0832	FWD	1290625	1291575	950 MU-487	1290637 galU	galU	1290680	43
TU-0833	FWD	1290625	1291575	950 MU-487	1290644 galU	galU	1290680	36
TU-0834	FWD	1290625	1291575	950 MU-487	1290649 galU	galU	1290680	31
TU-0835	FWD	1290625	1291575	950 MU-487	1290675 galU	galU	1290680	5
TU-0836	FWD	1292750	1293375	625 MU-488	1292716 tdk	tdk	1292750	34
TU-0837	FWD	1297825	1298325	500 MU-489	1297634 ychE	ychE	1297821	187
TU-0838	FWD	1298726	1299001	275 MU-490	1298695 NT			
TU-0839	FWD	1299026	1304726	5700 MU-491;MU-492	1299035 oppA;oppB;oppC;oppD;oppF	oppA	1299206	171
TU-0840	FWD	1299026	1304726	5700 MU-491;MU-492	1299087 oppA;oppB;oppC;oppD;oppF	oppA	1299206	119
TU-0841	FWD	1299026	1304726	5700 MU-491;MU-492	1299100 oppA;oppB;oppC;oppD;oppF	oppA	1299206	106
TU-0842	FWD	1299026	1304726	5700 MU-491;MU-492	1299154 oppA;oppB;oppC;oppD;oppF	oppA	1299206	52
TU-0843	FWD	1301126	1304726	3600 MU-492	1301158 oppB;oppC;oppD;oppF	oppB	1300923	-235
TU-0844	FWD	1301126	1304726	3600 MU-492	1301186 oppB;oppC;oppD;oppF	oppB	1300923	-263
TU-0845	FWD	1306751	1307101	350 MU-493	1306787 yciY	yciY	1306812	25
TU-0846	FWD	1309101	1309826	725 MU-494	1309082 tonB	tonB	1309113	31
TU-0847	FWD	1309101	1309826	725 MU-494	1309102 tonB	tonB	1309113	11
TU-0848	FWD	1312001	1312676	675 MU-495	1312015 ompW	ompW	1312044	29
TU-0849	FWD	1321227	1321802	575 MU-496	1321212 trpH	trpH	1321244	32
TU-0850	FWD	1321827	1322877	1050 MU-497	1321789 yciO	yciO	1322122	333
TU-0851	FWD	1323252	1324102	850 MU-498	yciQ	yciQ	1322770	
TU-0852	FWD	1324352	1324677	325 MU-499	1324321 NT			
TU-0853	FWD	1324727	1325752	1025 MU-500	1324784 rluB	rluB	1324876	92
TU-0854	FWD	1324727	1325752	1025 MU-500	1324836 rluB	rluB	1324876	40
TU-0855	FWD	1327352	1328377	1025 MU-501	1327326 sohB	sohB	1327356	30
TU-0856	FWD	1328827	1331652	2825 MU-502	1328821 topA	topA	1329072	251
TU-0857	FWD	1328827	1331652	2825 MU-502	1328843 topA	topA	1329072	229
TU-0858	FWD	1328827	1331652	2825 MU-502	1328907 topA	topA	1329072	165
TU-0859	FWD	1328827	1331652	2825 MU-502	1329004 topA	topA	1329072	68
TU-0860	FWD	1331813	1332813	1000 MU-503	1331785 cysB	cysB	1331879	94
TU-0861	FWD	1331813	1332813	1000 MU-503	1331795 cysB	cysB	1331879	84
TU-0862	FWD	1331813	1332813	1000 MU-503	1331804 cysB	cysB	1331879	75

TU-0863	FWD	1333138	1333613	475 MU-504	1333102 ymiA;yciX	ymia	1333184	82
TU-0864	FWD	1333138	1333613	475 MU-504	1333114 ymiA;yciX	ymia	1333184	70
TU-0865	FWD	1333138	1333613	475 MU-504	1333123 ymiA;yciX	ymia	1333184	61
TU-0866	FWD	1333763	1336913	3150 MU-505	1333453 acnA	acnA	1333855	402
TU-0867	FWD	1333763	1336913	3150 MU-505	1333805 acnA	acnA	1333855	50
TU-0868	FWD	1337363	1337938	575 MU-506	1337333 pgpB	pgpB	1337354	21
TU-0869	FWD	1337363	1337938	575 MU-506	1337396 pgpB	pgpB	1337354	-42
TU-0870	FWD	1337963	1339738	1775 MU-507	1338115 yciS;yciM	yciS	1338267	152
TU-0871	FWD	1337963	1339738	1775 MU-507	1338159 yciS;yciM	yciS	1338267	108
TU-0872	FWD	1339813	1341013	1200 MU-508	1339893 pyrF;yciH	pyrF	1339945	52
TU-0873	FWD	1339813	1341013	1200 MU-508	1339903 pyrF;yciH	pyrF	1339945	42
TU-0874	FWD	1359115	1364740	5625 MU-509	1359076 puuD;puuR;puuC;puuB;puuE	puuD	1359144	68
TU-0875	FWD	1359115	1364740	5625 MU-509	1359085 puuD;puuR;puuC;puuB;puuE	puuD	1359144	59
TU-0876	FWD	1359115	1364740	5625 MU-509	1359092 puuD;puuR;puuC;puuB;puuE	puuD	1359144	52
TU-0877	FWD	1359115	1364740	5625 MU-509	1359119 puuD;puuR;puuC;puuB;puuE	puuD	1359144	25
TU-0878	FWD	1366090	1367965	1875 MU-510;MU-511	1366062 pspA;pspB;pspC;pspD;pspE	pspA	1366103	41
TU-0879	FWD	1366090	1367965	1875 MU-510;MU-511	1366071 pspA;pspB;pspC;pspD;pspE	pspA	1366103	32
TU-0880	FWD	1367715	1367965	250 MU-511	1367686 pspE	pspE	1367713	27
TU-0881	FWD	1368590	1377965	9375 MU-512	ycjM;ycjN;ycjO;ycjP;ycjQ;ycjR;ycjS;ycjT;ycjU;ycjV;ompG	ycjM	1368240	
TU-0882	FWD	1382016	1384641	2625 MU-513	1382094 ycjX;ycjF	ycjX	1382141	47
TU-0883	FWD	1382016	1384641	2625 MU-513	1382105 ycjX;ycjF	ycjX	1382141	36
TU-0884	FWD	1384691	1386841	2150 MU-514	1384715 tyrR	tyrR	1384744	29
TU-0885	FWD	1384691	1386841	2150 MU-514	1384723 tyrR	tyrR	1384744	21
TU-0886	FWD	1386866	1388066	1200 MU-515	1386892 ycjG	ycjG	1386954	62
TU-0887	FWD	1390016	1390741	725 MU-516	1389971 ycjZ	ycjZ	1390015	44
TU-0888	FWD	1391016	1392666	1650 MU-517	1390986 mppA	mppA	1391251	265
TU-0889	FWD	1394091	1395266	1175 MU-518	1393945 insH	insH	1394100	155
TU-0890	FWD	1395391	1395841	450 MU-519	1395353 ynaJ	ynaJ	1395389	36
TU-0891	FWD	1395391	1395841	450 MU-519	1395364 ynaJ	ynaJ	1395389	25
TU-0892	FWD	1402717	1403792	1075 MU-520	1402725 abgR	abgR	1402765	40
TU-0893	FWD	1403942	1404742	800 MU-521	1403917 ydaL	ydaL	1404003	86
TU-0894	FWD	1403942	1404742	800 MU-521	1403980 ydaL	ydaL	1404003	23
TU-0895	FWD	1406017	1406542	525 MU-522	1406048 ydaN	ydaN	1406074	26
TU-0896	FWD	1406617	1407117	500 MU-523	1406499 NT			
TU-0897	FWD	1407167	1407242	75 MU-524	1407153 NT			
TU-0898	FWD	1407317	1408742	1425 MU-525	1407307 C0343;dbpA	C0343	1407387	80
TU-0899	FWD	1416695	1417183	488 MU-526	1416670 sieB	sieB	1416695	25
TU-0900	FWD	1418389	1421609	3220 MU-527	1418251 ydaS;ydaT;ydaU;ydaV;ydaW;rzpR;rzoR	ydaS	1418389	138
TU-0901	FWD	1421786	1423312	1526 MU-528	1421735 trkG	trkG	1421806	71
TU-0902	FWD	1423401	1424106	705 MU-529	ynaK;ydaY	ynaK	1423401	
TU-0903	FWD	1424478	1425622	1144 MU-530	ynaA;lomR	ynaA	1424478	
TU-0904	FWD	1427212	1428987	1775 MU-531	lomR;stfR;tfaR	lomR	1425413	
TU-0905	FWD	1429137	1430837	1700 MU-532	1429174 NT			
TU-0906	FWD	1431137	1431487	350 MU-533	1431209 NT			
TU-0907	FWD	1432488	1433313	825 MU-534	1432540 NT			

TU-0908	FWD	1435188	1435288	100 MU-535	1435014 micC	micC	1435145	131
TU-0909	FWD	1439063	1439638	575 MU-536	1439047 ydbJ	ydbJ	1439082	35
TU-0910	FWD	1441063	1444238	3175 MU-537;MU-538	1441032 ydbH;ynbE;ydbL	ydbH	1441075	43
TU-0911	FWD	1441063	1444238	3175 MU-537;MU-538	1441046 ydbH;ynbE;ydbL	ydbH	1441075	29
TU-0912	FWD	1443338	1444238	900 MU-538	1443593 ynbE;ydbL	ynbE	1443711	118
TU-0913	FWD	1445438	1447063	1625 MU-539	1445367 feaB	feaB	1445543	176
TU-0914	FWD	1451951	1460988	9037 MU-540;MU-541;MU-542	paaA;paaB;paaC;paaD;paaE;paaF;paaG;paaH;paaI;paaJ;paaK	paaA	1451951	
TU-0915	FWD	1459463	1460988	1525 MU-541;MU-542	1459465 paaJ	paaJ	1458917	-548
TU-0916	FWD	1460388	1460988	600 MU-542	1460199 paaK	paaK	1460149	-50
TU-0917	FWD	1461563	1463138	1575 MU-543	1461534 paaX;paaY	paaX	1461563	29
TU-0918	FWD	1464188	1465863	1675 MU-544	ydbA-1	ydbA	1463416	
TU-0919	FWD	1465913	1466163	250 MU-545	1465734 NT			
TU-0920	FWD	1465913	1466163	250 MU-545	1465893 NT			
TU-0921	FWD	1467238	1469113	1875 MU-546	1467293 ydbA;insI	ydbA	1467265	-28
TU-0922	FWD	1469163	1472038	2875 MU-547	1468976 ydbA-2	ydbA	1468541	-435
TU-0923	FWD	1469163	1472038	2875 MU-547	1469073 ydbA-2	ydbA	1468541	-532
TU-0924	FWD	1469163	1472038	2875 MU-547	1469159 ydbA-2	ydbA	1468541	-618
TU-0925	FWD	1472238	1472913	675 MU-548	1472213 ydbC	ydbC	1472245	32
TU-0926	FWD	1473168	1475474	2306 MU-549	ydbD	ydbD	1473168	
TU-0927	FWD	1475645	1480225	4580 MU-550	ynbA;ynbB;ynbC;ynbD	ynbA	1475645	
TU-0928	FWD	1481072	1484999	3927 MU-551	1481038 hrpA	hrpA	1481085	47
TU-0929	FWD	1485217	1486017	800 MU-552	1485191 ydcF	ydcF	1485259	68
TU-0930	FWD	1485217	1486017	800 MU-552	1485228 ydcF	ydcF	1485259	31
TU-0931	FWD	1486242	1488067	1825 MU-553	1486215 aldA	aldA	1486256	41
TU-0932	FWD	1488942	1489617	675 MU-554	1488899 cybB	cybB	1488926	27
TU-0933	FWD	1489667	1489967	300 MU-555	1489467 ydcA	ydcA	1489701	234
TU-0934	FWD	1490143	1490198	55 MU-556	1489838 sokB	sokB	1490143	305
TU-0935	FWD	1490442	1492142	1700 MU-557	1490461 trg	trg	1490494	33
TU-0936	FWD	1493242	1494267	1025 MU-558	1493185 ydcJ	ydcJ	1493312	127
TU-0937	FWD	1494817	1496527	1710 MU-559	1494803 mdoD	mdoD	1494880	77
TU-0938	FWD	1496652	1496902	250 MU-560	ydcH	ydcH	1496675	
TU-0939	FWD	1496952	1497477	525 MU-561	1496788 rimL	rimL	1496962	174
TU-0940	FWD	1498477	1500352	1875 MU-562	1498559 tehA;tehB	tehA	1498597	38
TU-0941	FWD	1500427	1501355	928 MU-563	1500452 ydcL	ydcL	1500481	29
TU-0942	FWD	1501530	1502880	1350 MU-564	1501681 ydcM	ydcM	1501681	0
TU-0943	FWD	1503982	1504057	75 MU-565	1503923 NT			
TU-0944	FWD	1504207	1506832	2625 MU-566	1504343 ydcN;ydcP	ydcN	1504196	-147
TU-0945	FWD	1507307	1507957	650 MU-567	1507299 yncN;ydcQ	yncN	1507310	11
TU-0946	FWD	1508007	1509213	1206 MU-568	1508002 ydcR	ydcR	1508027	25
TU-0947	FWD	1509543	1515050	5507 MU-569;MU-570	1509620 ydcS;ydcT;ydcU;ydcV;ydcW	ydcS	1509678	58
TU-0948	FWD	1509543	1515050	5507 MU-569;MU-570	1509628 ydcS;ydcT;ydcU;ydcV;ydcW	ydcS	1509678	50
TU-0949	FWD	1512525	1515050	2525 MU-570	1512672 ydcV;ydcW	ydcV	1512786	114
TU-0950	FWD	1515400	1515575	175 MU-571	1515286 ydcX	ydcX	1515413	127
TU-0951	FWD	1515400	1515575	175 MU-571	1515384 ydcX	ydcX	1515413	29
TU-0952	FWD	1515600	1516350	750 MU-572	1515636 ydcY	ydcY	1515672	36

TU-0953	FWD	1517050	1518875	1825 MU-573;MU-574	1517023 yncB;yncC	yncB	1517027	4
TU-0954	FWD	1518275	1518875	600 MU-574	1518295 yncC	yncC	1518286	-9
TU-0955	FWD	1518275	1518875	600 MU-574	1518318 yncC	yncC	1518286	-32
TU-0956	FWD	1521275	1522450	1175 MU-575	1521251 yncE	yncE	1521331	80
TU-0957	FWD	1521275	1522450	1175 MU-575	1521288 yncE	yncE	1521331	43
TU-0958	FWD	1524225	1524750	525 MU-576	1524249 yncG	yncG	1524271	22
TU-0959	FWD	1524964	1525176	212 MU-577	yncH	yncH	1524964	
TU-0960	FWD	1526225	1526875	650 MU-578	rhsE	rhsE	1525926	
TU-0961	FWD	1528256	1528431	175 MU-579	ydcD	ydcD	1527946	
TU-0962	FWD	1528610	1530976	2366 MU-580	1528575 yncI;ydcC	yncI	1528610	35
TU-0963	FWD	1530906	1531381	475 MU-581	1531009 pptA	pptA	1531076	67
TU-0964	FWD	1530906	1531381	475 MU-581	1531017 pptA	pptA	1531076	59
TU-0965	FWD	1530906	1531381	475 MU-581	1531054 pptA	pptA	1531076	22
TU-0966	FWD	1532056	1532881	825 MU-582	1532024 nhoA	nhoA	1532048	24
TU-0967	FWD	1545417	1548217	2800 MU-583	1545331 fdnG;fdnH;fdnI;C0362	fdnG	1545425	94
TU-0968	FWD	1550025	1550410	385 MU-584	C0362	C0362	1550025	
TU-0969	FWD	1554542	1555192	650 MU-585	1554623 osmC	osmC	1554649	26
TU-0970	FWD	1554542	1555192	650 MU-585	1554633 osmC	osmC	1554649	16
TU-0971	FWD	1590462	1590637	175 MU-586	1590454 NT			
TU-0972	FWD	1590462	1590637	175 MU-586	1590496 NT			
TU-0973	FWD	1601212	1603887	2675 MU-587	IsrA;IsrC;IsrD;IsrB	IsrA	1599514	
TU-0974	FWD	1604162	1605262	1100 MU-588	1604091 IsrF;IsrG	IsrF	1604124	33
TU-0975	FWD	1605362	1606412	1050 MU-589	1605347 tam	tam	1605370	23
TU-0976	FWD	1609962	1610212	250 MU-590	NT			
TU-0977	FWD	1612687	1613462	775 MU-591	1612804 yneJ	yneJ	1612828	24
TU-0978	FWD	1613787	1614902	1115 MU-592	yncK	yncK	1613787	
TU-0979	FWD	1615037	1616212	1175 MU-593	1615019 ydeA	ydeA	1615052	33
TU-0980	FWD	1615037	1616212	1175 MU-593	1615025 ydeA	ydeA	1615052	27
TU-0981	FWD	1617162	1618212	1050 MU-594	1617117 marR;marA;marB	marR	1617144	27
TU-0982	FWD	1619362	1620487	1125 MU-595	1619451 ydeE	ydeE	1619356	-95
TU-0983	FWD	1620587	1620837	250 MU-596	1620611 yneM	yncM	1620670	59
TU-0984	FWD	1620587	1620837	250 MU-596	1620623 yneM	yncM	1620670	47
TU-0985	FWD	1620587	1620837	250 MU-596	1620630 yneM	yncM	1620670	40
TU-0986	FWD	1622612	1623162	550 MU-597	1622714 ydeJ	ydeJ	1622797	83
TU-0987	FWD	1622612	1623162	550 MU-597	1622754 ydeJ	ydeJ	1622797	43
TU-0988	FWD	1622612	1623162	550 MU-597	1622768 ydeJ	ydeJ	1622797	29
TU-0989	FWD	1625487	1626287	800 MU-598	1625515 ydfG	ydfG	1625541	26
TU-0990	FWD	1625487	1626287	800 MU-598	1625525 ydfG	ydfG	1625541	16
TU-0991	FWD	1626337	1627037	700 MU-599	1626350 ydfH	ydfH	1626376	26
TU-0992	FWD	1627212	1627612	400 MU-600	1627192 ydfZ	ydfZ	1627239	47
TU-0993	FWD	1629462	1629787	325 MU-601	NT			
TU-0994	FWD	1630762	1631187	425 MU-602	1630662 ydfK	ydfK	1631063	401
TU-0995	FWD	1631646	1632236	590 MU-603	pinQ	pinQ	1631646	
TU-0996	FWD	1634780	1635481	701 MU-604	ynfO;ydfO	ynfO	1634780	
TU-0997	FWD	1639879	1640091	212 MU-605	cspF	cspF	1639879	
TU-0998	FWD	1640137	1640362	225 MU-606	1640110 NT			

TU-0999	FWD	1644090	1644315	225 MU-607	1644252 ydfV	ydfV	1643921	-331
TU-1000	FWD	1644390	1644690	300 MU-608	1644356 flxA	flxA	1644429	73
TU-1001	FWD	1644390	1644690	300 MU-608	1644385 flxA	flxA	1644429	44
TU-1002	FWD	1644390	1644690	300 MU-608	1644410 flxA	flxA	1644429	19
TU-1003	FWD	1645990	1646340	350 MU-609	1645955 dicA	dicA	1645958	3
TU-1004	FWD	1645990	1646340	350 MU-609	1645971 dicA	dicA	1645958	-13
TU-1005	FWD	1646540	1646840	300 MU-610	1646462 ydfA;ydfB;rzpQ	ydfA	1646532	70
TU-1006	FWD	1647240	1647415	175 MU-611	1647206 dicF	dicF	1647406	200
TU-1007	FWD	1647240	1647415	175 MU-611	1647275 dicF	dicF	1647406	131
TU-1008	FWD	1647633	1648009	376 MU-612	dicB;ydfD	dicB	1647633	
TU-1009	FWD	1648102	1648866	764 MU-613	ydfE	ydfE	1648102	
TU-1010	FWD	1648890	1650165	1275 MU-614	insD	insD	1648869	
TU-1011	FWD	1649575	1650732	1157 MU-615	intQ	intQ	1649575	
TU-1012	FWD	1653745	1654770	1025 MU-616	1653746 ynfB;speG	ynfB	1653832	86
TU-1013	FWD	1653745	1654770	1025 MU-616	1653808 ynfB;speG	ynfB	1653832	24
TU-1014	FWD	1655595	1655945	350 MU-617	1655563 ynfD	ynfD	1655589	26
TU-1015	FWD	1655595	1655945	350 MU-617	1655569 ynfD	ynfD	1655589	20
TU-1016	FWD	1656095	1663220	7125 MU-618;MU-619;MU-620;MU-621	1656059 ynfE;ynfF;ynfG;ynfH;dmsD	ynfE	1656093	34
TU-1017	FWD	1656095	1663220	7125 MU-618;MU-619;MU-620;MU-621	1656061 ynfE;ynfF;ynfG;ynfH;dmsD	ynfE	1656093	32
TU-1018	FWD	1657495	1663220	5725 MU-619;MU-620;MU-621	1657572 ynfF;ynfG;ynfH;dmsD	ynfF	1658580	1008
TU-1019	FWD	1657495	1663220	5725 MU-619;MU-620;MU-621	1657638 ynfF;ynfG;ynfH;dmsD	ynfF	1658580	942
TU-1020	FWD	1659745	1663220	3475 MU-620;MU-621	1659685 ynfG;ynfH;dmsD	ynfG	1661014	1329
TU-1021	FWD	1661620	1663220	1600 MU-621	1661476 ynfH;dmsD	ynfH	1661633	157
TU-1022	FWD	1661620	1663220	1600 MU-621	1661746 ynfH;dmsD	ynfH	1661633	-113
TU-1023	FWD	1663320	1663970	650 MU-622	1663316 clcB	clcB	1663339	23
TU-1024	FWD	1663320	1663970	650 MU-622	1663319 clcB	clcB	1663339	20
TU-1025	FWD	1667720	1669045	1325 MU-623	1667686 ynfM	ynfM	1667723	37
TU-1026	FWD	1667720	1669045	1325 MU-623	1667781 ynfM	ynfM	1667723	-58
TU-1027	FWD	1669370	1669670	300 MU-624	1669351 asr	asr	1669400	49
TU-1028	FWD	1669801	1669884	83 MU-625	ydgU	ydgU	1669801	
TU-1029	FWD	1669970	1670970	1000 MU-626	1669940 ydgD	ydgD	1669984	44
TU-1030	FWD	1671945	1672870	925 MU-627	1671914 tqSA	tqSA	1671937	23
TU-1031	FWD	1676295	1678345	2050 MU-628	1676332 ydgH;ydGI	ydgH	1676451	119
TU-1032	FWD	1676295	1678345	2050 MU-628	1676394 ydgH;ydGI	ydgH	1676451	57
TU-1033	FWD	1676295	1678345	2050 MU-628	1676402 ydgH;ydGI	ydgH	1676451	49
TU-1034	FWD	1678795	1679795	1000 MU-629	1678643 folM	folM	1679000	357
TU-1035	FWD	1678795	1679795	1000 MU-629	1678869 folM	folM	1679000	131
TU-1036	FWD	1680195	1682220	2025 MU-630	1680159 rstA;rstB	rstA	1680183	24
TU-1037	FWD	1680195	1682220	2025 MU-630	1680160 rstA;rstB	rstA	1680183	23
TU-1038	FWD	1682270	1683445	1175 MU-631	1682257 tus	tus	1682283	26
TU-1039	FWD	1686595	1687720	1125 MU-632	1686569 manA	manA	1686600	31
TU-1040	FWD	1686595	1687720	1125 MU-632	1686575 manA	manA	1686600	25
TU-1041	FWD	1687845	1689545	1700 MU-633	1687818 ydgA	ydgA	1687876	58
TU-1042	FWD	1697346	1700121	2775 MU-634;MU-635	1697338 malX;malY	malX	1697379	41
TU-1043	FWD	1697346	1700121	2775 MU-634;MU-635	1697348 malX;malY	malX	1697379	31
TU-1044	FWD	1698921	1700121	1200 MU-635	1698864 malY	malY	1698981	117

TU-1045	FWD	1700246	1701121	875 MU-636	1700228 add	add	1700257	29
TU-1046	FWD	1702171	1702196	25 MU-637	1702086 NT			
TU-1047	FWD	1702571	1702921	350 MU-638	1702412 blr	blr	1702575	163
TU-1048	FWD	1702571	1702921	350 MU-638	1702536 blr	blr	1702575	39
TU-1049	FWD	1702971	1703046	75 MU-639	1702879 cnu	cnu	1702973	94
TU-1050	FWD	1703096	1710096	7000 MU-640;MU-641	1703230 ydgK;rsxA;rsxB;rsxC;rsxD;rsxE;rsxF;rsyG;rsyE;nth	ydgK	1703274	44
TU-1051	FWD	1703746	1710096	6350 MU-641	rsxA;rsxB;rsxC;rsxD;rsxE;rsxF;rsyG;rsyE;nth	rsxA	1703791	
TU-1052	FWD	1710796	1712296	1500 MU-642	1710713 tppB	tppB	1710793	80
TU-1053	FWD	1712396	1713246	850 MU-643	1712376 gst	gst	1712401	25
TU-1054	FWD	1717796	1718721	925 MU-644	1717775 slyB	slyB	1717900	125
TU-1055	FWD	1717796	1718721	925 MU-644	1717783 slyB	slyB	1717900	117
TU-1056	FWD	1717796	1718721	925 MU-644	1717794 slyB	slyB	1717900	106
TU-1057	FWD	1717796	1718721	925 MU-644	1717801 slyB	slyB	1717900	99
TU-1058	FWD	1717796	1718721	925 MU-644	1717842 slyB	slyB	1717900	58
TU-1059	FWD	1717796	1718721	925 MU-644	1717855 slyB	slyB	1717900	45
TU-1060	FWD	1717796	1718721	925 MU-644	1717893 slyB	slyB	1717900	7
TU-1061	FWD	1718796	1722046	3250 MU-645	1718960 ydhI;ydhJ;ydhK	ydhI	1719049	89
TU-1062	FWD	1718796	1722046	3250 MU-645	1719022 ydhI;ydhJ;ydhK	ydhI	1719049	27
TU-1063	FWD	1724071	1725771	1700 MU-646	1724047 ydhM;nemA	ydhM	1724047	0
TU-1064	FWD	1724071	1725771	1700 MU-646	1724064 ydhM;nemA	ydhM	1724047	-17
TU-1065	FWD	1725846	1726265	419 MU-647	1725785 gloA	gloA	1725861	76
TU-1066	FWD	1725846	1726265	419 MU-647	1725824 gloA	gloA	1725861	37
TU-1067	FWD	1725846	1726265	419 MU-647	1725833 gloA	gloA	1725861	28
TU-1068	FWD	1726365	1731490	5125 MU-648	1726343 rnt;lhr	rnt	1726371	28
TU-1069	FWD	1732440	1733215	775 MU-649	1732405 ydhO	ydhO	1732459	54
TU-1070	FWD	1733365	1734090	725 MU-650	1733349 sodB	sodB	1733402	53
TU-1071	FWD	1733365	1734090	725 MU-650	1733362 sodB	sodB	1733402	40
TU-1072	FWD	1733365	1734090	725 MU-650	1733380 sodB	sodB	1733402	22
TU-1073	FWD	1735740	1736990	1250 MU-651	1735712 purR	purR	1735868	156
TU-1074	FWD	1735740	1736990	1250 MU-651	1735720 purR	purR	1735868	148
TU-1075	FWD	1737990	1738890	900 MU-652	1737904 ydhC	ydhC	1737935	31
TU-1076	FWD	1739240	1740565	1325 MU-653	1739225 cfa	cfa	1739437	212
TU-1077	FWD	1739240	1740565	1325 MU-653	1739338 cfa	cfa	1739437	99
TU-1078	FWD	1739240	1740565	1325 MU-653	1739404 cfa	cfa	1739437	33
TU-1079	FWD	1741415	1742840	1425 MU-654	1741414 mdtK	mdtK	1741481	67
TU-1080	FWD	1744465	1744665	200 MU-655	1744459 valV;valW	valV	1744459	0
TU-1081	FWD	1744715	1744990	275 MU-656	1744697 ydhR	ydhR	1744724	27
TU-1082	FWD	1745165	1746840	1675 MU-657	1745115 ydhS	ydhS	1745155	40
TU-1083	FWD	1753390	1755140	1750 MU-658	1753583 pykF	pykF	1753722	139
TU-1084	FWD	1753390	1755140	1750 MU-658	1753624 pykF	pykF	1753722	98
TU-1085	FWD	1753390	1755140	1750 MU-658	1753637 pykF	pykF	1753722	85
TU-1086	FWD	1753390	1755140	1750 MU-658	1753651 pykF	pykF	1753722	71
TU-1087	FWD	1753390	1755140	1750 MU-658	1753685 pykF	pykF	1753722	37
TU-1088	FWD	1753390	1755140	1750 MU-658	1753695 pykF	pykF	1753722	27
TU-1089	FWD	1753390	1755140	1750 MU-658	1753703 pykF	pykF	1753722	19
TU-1090	FWD	1755415	1755865	450 MU-659	1755407 lpp	lpp	1755445	38



TU-1091	FWD	1755415	1755865	450 MU-659	1755419 lpp	lpp	1755445	26
TU-1092	FWD	1766895	1768145	1250 MU-660	1766794 ydiK	ydiK	1767098	304
TU-1093	FWD	1768396	1768501	105 MU-661	1768396 rprA	rprA	1768396	0
TU-1094	FWD	1768645	1768845	200 MU-662	ydiL	ydiL	1768639	
TU-1095	FWD	1769095	1770309	1214 MU-663	ydiM	ydiM	1769095	
TU-1096	FWD	1770530	1772679	2149 MU-664	ydiN;ydiB	ydiN	1770530	
TU-1097	FWD	1772620	1773445	825 MU-665	1772646 aroD	aroD	1772710	64
TU-1098	FWD	1774045	1774945	900 MU-666	ydiF;ydiO	ydiF	1773611	
TU-1099	FWD	1777641	1780998	3357 MU-667	ydiQ;ydiR;ydiS;ydiT	ydiQ	1777641	
TU-1100	FWD	1781055	1782701	1646 MU-668	fadK	fadK	1781055	
TU-1101	FWD	1785472	1786322	850 MU-669	1785439 ydiA	ydiA	1785469	30
TU-1102	FWD	1786372	1787472	1100 MU-670	1786345 aroH	aroH	1786459	114
TU-1103	FWD	1786372	1787472	1100 MU-670	1786408 aroH	aroH	1786459	51
TU-1104	FWD	1786372	1787472	1100 MU-670	1786444 aroH	aroH	1786459	15
TU-1105	FWD	1787647	1787772	125 MU-671	1787609 ydiE	ydiE	1787637	28
TU-1106	FWD	1797297	1798022	725 MU-672	1797314 NT			
TU-1107	FWD	1801118	1803017	1899 MU-673	arpB	arpB	1801118	
TU-1108	FWD	1803222	1803297	75 MU-674	1803158 yniD	yniD	1803189	31
TU-1109	FWD	1804347	1805322	975 MU-675	1804346 pfkB	pfkB	1804394	48
TU-1110	FWD	1804347	1805322	975 MU-675	1804376 pfkB	pfkB	1804394	18
TU-1111	FWD	1805372	1806722	1350 MU-676;MU-677	1805399 ydiZ;yniA	ydiZ	1805424	25
TU-1112	FWD	1805797	1806722	925 MU-677	1805794 yniA	yniA	1805820	26
TU-1113	FWD	1807347	1808047	700 MU-678	1807303 yniC	yniC	1807404	101
TU-1114	FWD	1807347	1808047	700 MU-678	1807313 yniC	yniC	1807404	91
TU-1115	FWD	1807347	1808047	700 MU-678	1807348 yniC	yniC	1807404	56
TU-1116	FWD	1808247	1808597	350 MU-679	ydjM	ydjM	1808223	
TU-1117	FWD	1808947	1810672	1725 MU-680	1808906 ydjN	ydjN	1808958	52
TU-1118	FWD	1808947	1810672	1725 MU-680	1808938 ydjN	ydjN	1808958	20
TU-1119	FWD	1808947	1810672	1725 MU-680	1808943 ydjN	ydjN	1808958	15
TU-1120	FWD	1811854	1814229	2375 MU-681	1811839 katE	katE	1811891	52
TU-1121	FWD	1820460	1821335	875 MU-682	1820452 nadE	nadE	1820482	30
TU-1122	FWD	1820460	1821335	875 MU-682	1820460 nadE	nadE	1820482	22
TU-1123	FWD	1821435	1822310	875 MU-683	1821516 cho	cho	1821539	23
TU-1124	FWD	1830435	1831235	800 MU-684	1830423 xthA	xthA	1830452	29
TU-1125	FWD	1831385	1833210	1825 MU-685;MU-686	1831520 ydjX;ydjY;ydjZ;ynjA;ynjB;ynjC;ynjD;ynjE	ydjX	1831425	-95
TU-1126	FWD	1831985	1838735	6750 MU-686;MU-687	1832010 ydjY;ydjZ;ynjA;ynjB;ynjC;ynjD;ynjE	ydjY	1832140	130
TU-1127	FWD	1833360	1838735	5375 MU-687	1833171 ynjA;ynjB;ynjC;ynjD;ynjE	ynjA	1833539	368
TU-1128	FWD	1833360	1838735	5375 MU-687	1833341 ynjA;ynjB;ynjC;ynjD;ynjE	ynjA	1833539	198
TU-1129	FWD	1833360	1838735	5375 MU-687	1833483 ynjA;ynjB;ynjC;ynjD;ynjE	ynjA	1833539	56
TU-1130	FWD	1839510	1839860	350 MU-688	1839484 nudG	nudG	1839514	30
TU-1131	FWD	1840360	1841885	1525 MU-689	1840289 gdhA	gdhA	1840395	106
TU-1132	FWD	1840360	1841885	1525 MU-689	1840332 gdhA	gdhA	1840395	63
TU-1133	FWD	1840360	1841885	1525 MU-689	1840340 gdhA	gdhA	1840395	55
TU-1134	FWD	1840360	1841885	1525 MU-689	1840347 gdhA	gdhA	1840395	48
TU-1135	FWD	1840360	1841885	1525 MU-689	1840356 gdhA	gdhA	1840395	39
TU-1136	FWD	1840360	1841885	1525 MU-689	1840362 gdhA	gdhA	1840395	33

TU-1137	FWD	1840360	1841885	1525 MU-689	1840370	gdhA	gdhA	1840395	25
TU-1138	FWD	1840360	1841885	1525 MU-689	1840385	gdhA	gdhA	1840395	10
TU-1139	FWD	1846835	1848660	1825 MU-690	1846816	sppA	sppA	1846861	45
TU-1140	FWD	1848885	1850535	1650 MU-691	1848858	ansA;pncA	ansA	1848884	26
TU-1141	FWD	1850810	1850885	75 MU-692		NT			
TU-1142	FWD	1860560	1861810	1250 MU-693	1860550	gapA	gapA	1860795	245
TU-1143	FWD	1860560	1861810	1250 MU-693	1860641	gapA	gapA	1860795	154
TU-1144	FWD	1860560	1861810	1250 MU-693	1860750	gapA	gapA	1860795	45
TU-1145	FWD	1860560	1861810	1250 MU-693	1860759	gapA	gapA	1860795	36
TU-1146	FWD	1860560	1861810	1250 MU-693	1860764	gapA	gapA	1860795	31
TU-1147	FWD	1860560	1861810	1250 MU-693	1860768	gapA	gapA	1860795	27
TU-1148	FWD	1860560	1861810	1250 MU-693	1860775	gapA	gapA	1860795	20
TU-1149	FWD	1861860	1862710	850 MU-694	1861848	yeaD	yeaD	1861874	26
TU-1150	FWD	1864793	1868243	3450 MU-695	1864771	yeaG;yeaH	yeaG	1864932	161
TU-1151	FWD	1868409	1869884	1475 MU-696		yeaI	yeaI	1868409	
TU-1152	FWD	1869318	1869793	475 MU-697	1869267	NT			
TU-1153	FWD	1870018	1871418	1400 MU-698	1870070	yeaJ	yeaJ	1870065	-5
TU-1154	FWD	1871568	1872093	525 MU-699	1871568	yeaK	yeaK	1871598	30
TU-1155	FWD	1872143	1872693	550 MU-700	1872376	yeaL	yeaL	1872376	0
TU-1156	FWD	1873697	1874878	1181 MU-701	1873676	yeaN	yeaN	1873697	21
TU-1157	FWD	1874868	1875268	400 MU-702	1874890	yeaO	yeaO	1874933	43
TU-1158	FWD	1874868	1875268	400 MU-702	1874905	yeaO	yeaO	1874933	28
TU-1159	FWD	1875718	1876893	1175 MU-703	1875691	yeaP	yeaP	1875739	48
TU-1160	FWD	1880143	1880693	550 MU-704	1879856	yeaU	yeaU	1879936	80
TU-1161	FWD	1881212	1884834	3622 MU-705	1881168	yeaV;yeaW;yeaX	yeaV	1881212	44
TU-1162	FWD	1891343	1891743	400 MU-706	1891360	yoaB	yoaB	1891391	31
TU-1163	FWD	1891343	1891743	400 MU-706	1891366	yoaB	yoaB	1891391	25
TU-1164	FWD	1891343	1891743	400 MU-706	1891374	yoaB	yoaB	1891391	17
TU-1165	FWD	1891918	1892468	550 MU-707	1892041	yoaC	yoaC	1892097	56
TU-1166	FWD	1892793	1894770	1977 MU-708	1892781	pabB;nudL	pabB	1892829	48
TU-1167	FWD	1894820	1896370	1550 MU-709	1894833	sdaA	sdaA	1894956	123
TU-1168	FWD	1896445	1898070	1625 MU-710		yoaD	yoaD	1896451	
TU-1169	FWD	1899920	1902770	2850 MU-711;MU-712	1899959	manX;manY;manZ	manX	1900072	113
TU-1170	FWD	1899920	1902770	2850 MU-711;MU-712	1900054	manX;manY;manZ	manX	1900072	18
TU-1171	FWD	1901170	1902770	1600 MU-712	1901068	manY;manZ	manY	1901106	38
TU-1172	FWD	1901170	1902770	1600 MU-712	1901076	manY;manZ	manY	1901106	30
TU-1173	FWD	1902820	1903195	375 MU-713	1902743	yobD	yobD	1902825	82
TU-1174	FWD	1903595	1903995	400 MU-714	1903486	yebN	yebN	1903712	226
TU-1175	FWD	1906195	1906520	325 MU-715	1906179	NT			
TU-1176	FWD	1906945	1907170	225 MU-716	1906925	yobH	yobH	1906949	24
TU-1177	FWD	1908300	1909673	1373 MU-717		yebQ	yebQ	1908300	
TU-1178	FWD	1914270	1918070	3800 MU-718;MU-719	1914178	yebS;yebT	yebS	1914282	104
TU-1179	FWD	1914270	1918070	3800 MU-718;MU-719	1914258	yebS;yebT	yebS	1914282	24
TU-1180	FWD	1915295	1918070	2775 MU-719	1915436	yebT	yebT	1915534	98
TU-1181	FWD	1918245	1919670	1425 MU-720	1918223	rsmF	rsmF	1918247	24
TU-1182	FWD	1919770	1920045	275 MU-721	1919749	yebV	yebV	1919804	55

TU-1183	FWD	1920096	1920471	375 MU-722	1920121 yebW	yebW	1920145	24
TU-1184	FWD	1921071	1921321	250 MU-723	1921090 ryeA	ryeA	1921090	0
TU-1185	FWD	1923046	1923421	375 MU-724	1923112 holE	holE	1923132	20
TU-1186	FWD	1923446	1924246	800 MU-725	1923413 yobB	yobB	1923464	51
TU-1187	FWD	1924271	1924771	500 MU-726	1924122 exoX	exoX	1924144	22
TU-1188	FWD	1928921	1930096	1175 MU-727	1928881 purT	purT	1928905	24
TU-1189	FWD	1934424	1935599	1175 MU-728	1934613 yebK	yebK	1934676	63
TU-1190	FWD	1935624	1937199	1575 MU-729	1935526 pykA	pykA	1935673	147
TU-1191	FWD	1935624	1937199	1575 MU-729	1935566 pykA	pykA	1935673	107
TU-1192	FWD	1935624	1937199	1575 MU-729	1935571 pykA	pykA	1935673	102
TU-1193	FWD	1940649	1942374	1725 MU-730	1940581 znuC;znuB	znuC	1940686	105
TU-1194	FWD	1940649	1942374	1725 MU-730	1940614 znuC;znuB	znuC	1940686	72
TU-1195	FWD	1940649	1942374	1725 MU-730	1940625 znuC;znuB	znuC	1940686	61
TU-1196	FWD	1940649	1942374	1725 MU-730	1940658 znuC;znuB	znuC	1940686	28
TU-1197	FWD	1944275	1944877	602 MU-731	1944248 yebB	yebB	1944275	27
TU-1198	FWD	1948824	1950124	1300 MU-732	1948632 yecD;yecE	yecD	1948856	224
TU-1199	FWD	1948824	1950124	1300 MU-732	1948794 yecD;yecE	yecD	1948856	62
TU-1200	FWD	1950274	1952474	2200 MU-733	1950455 yecN;cmoA;cmoB	yecN	1950290	-165
TU-1201	FWD	1953649	1953874	225 MU-734	1953581 NT			
TU-1202	FWD	1958049	1959799	1750 MU-735	1958029 argS	argS	1958086	57
TU-1203	FWD	1959996	1960484	488 MU-736	yecT	yecT	1959996	
TU-1204	FWD	1970763	1970840	77 MU-737	C0465	C0465	1970763	
TU-1205	FWD	1977349	1977424	75 MU-738	1977320 NT			
TU-1206	FWD	1977699	1978299	600 MU-739	1977744 uspC	uspC	1977777	33
TU-1207	FWD	1980599	1980799	200 MU-740	1980567 NT			
TU-1208	FWD	1984802	1985427	625 MU-741	1984821 ftnB	ftnB	1984949	128
TU-1209	FWD	1986246	1986569	323 MU-742	yecR	yecR	1986246	
TU-1210	FWD	1986727	1987227	500 MU-743	1986706 ftnA	ftnA	1986740	34
TU-1211	FWD	1986727	1987227	500 MU-743	1986724 ftnA	ftnA	1986740	16
TU-1212	FWD	1987702	1988902	1200 MU-744	1987667 tyrP	tyrP	1987705	38
TU-1213	FWD	1993830	1994030	200 MU-745	1993798 yecF	yecF	1993842	44
TU-1214	FWD	1993830	1994030	200 MU-745	1993814 yecF	yecF	1993842	28
TU-1215	FWD	1994905	1995130	225 MU-746	1994856 NT			
TU-1216	FWD	1998530	1998730	200 MU-747	1998511 NT			
TU-1217	FWD	2001896	2004102	2206 MU-748	2001860 fliD;fliS;fliT	fliD	2001896	36
TU-1218	FWD	2001896	2004102	2206 MU-748	2001866 fliD;fliS;fliT	fliD	2001896	30
TU-1219	FWD	2004173	2005673	1500 MU-749	2004156 amyA	amyA	2004180	24
TU-1220	FWD	2006298	2007723	1425 MU-750	2006264 yedE;yedF	yedE	2006301	37
TU-1221	FWD	2007823	2008523	700 MU-751	2007826 yedK	yedK	2007845	19
TU-1222	FWD	2007823	2008523	700 MU-751	2007831 yedK	yedK	2007845	14
TU-1223	FWD	2008623	2009223	600 MU-752	2008610 yedL	yedL	2008624	14
TU-1224	FWD	2008623	2009223	600 MU-752	2008621 yedL	yedL	2008624	3
TU-1225	FWD	2010526	2010687	161 MU-753	intG	intG	2010526	
TU-1226	FWD	2011723	2016823	5100 MU-754	2011167 fliF;fliG;fliH;fliI;fliJ;fliK	fliF	2011253	86
TU-1227	FWD	2017748	2018998	1250 MU-755	2017609 fliL;fliM;fliN;fliO;fliP;fliQ;fliR	fliL	2017642	33
TU-1228	FWD	2019112	2021702	2590 MU-756	2018934 fliN;fliO;fliP;fliQ;fliR	fliN	2019112	178

TU-1229	FWD	2021992	2022615	623 MU-757	2021861 rcsA	rcsA	2021992	131
TU-1230	FWD	2022977	2023252	275 MU-758	2022951 yodD	yodD	2023010	59
TU-1231	FWD	2023302	2024427	1125 MU-759	2023477 yedP	yedP	2023535	58
TU-1232	FWD	2027563	2028483	920 MU-760	yedA	yedA	2027563	
TU-1233	FWD	2031673	2031763	90 MU-761	rseX	rseX	2031673	
TU-1234	FWD	2032027	2033202	1175 MU-762	2032159 yedS	yedS	2032075	-84
TU-1235	FWD	2033677	2034727	1050 MU-763	2033655 hchA	hchA	2033859	204
TU-1236	FWD	2033677	2034727	1050 MU-763	2033776 hchA	hchA	2033859	83
TU-1237	FWD	2033677	2034727	1050 MU-763	2033785 hchA	hchA	2033859	74
TU-1238	FWD	2033677	2034727	1050 MU-763	2033789 hchA	hchA	2033859	70
TU-1239	FWD	2033677	2034727	1050 MU-763	2033804 hchA	hchA	2033859	55
TU-1240	FWD	2036977	2037677	700 MU-764	2036955 yedX	yedX	2036980	25
TU-1241	FWD	2037752	2039127	1375 MU-765	2037773 yedY;yedZ	yedY	2037502	-271
TU-1242	FWD	2039377	2040127	750 MU-766	2039362 yodA	yodA	2039399	37
TU-1243	FWD	2039377	2040127	750 MU-766	2039368 yodA	yodA	2039399	31
TU-1244	FWD	2039377	2040127	750 MU-766	2039374 yodA	yodA	2039399	25
TU-1245	FWD	2039377	2040127	750 MU-766	2039382 yodA	yodA	2039399	17
TU-1246	FWD	2040152	2041112	960 MU-767	2039935 yodB	yodB	2040392	457
TU-1247	FWD	2041462	2042539	1077 MU-768	2041628 mtfA	mtfA	2041675	47
TU-1248	FWD	2042589	2042739	150 MU-769	2042462 asnT	asnT	2042573	111
TU-1249	FWD	2042962	2050038	7076 MU-770	yeeJ	yeeJ	2042962	
TU-1250	FWD	2047789	2049889	2100 MU-771	2047956 NT			
TU-1251	FWD	2051614	2052989	1375 MU-772	2051590 shiA	shiA	2051667	77
TU-1252	FWD	2053064	2054514	1450 MU-773	2053054 amn	amn	2053085	31
TU-1253	FWD	2054864	2055564	700 MU-774	2054822 yeeN	yeeN	2054882	60
TU-1254	FWD	2054864	2055564	700 MU-774	2054830 yeeN	yeeN	2054882	52
TU-1255	FWD	2054864	2055564	700 MU-774	2054841 yeeN	yeeN	2054882	41
TU-1256	FWD	2054864	2055564	700 MU-774	2054850 yeeN	yeeN	2054882	32
TU-1257	FWD	2054864	2055564	700 MU-774	2054862 yeeN	yeeN	2054882	20
TU-1258	FWD	2057884	2058034	150 MU-775	2057875 asnU	asnU	2057875	0
TU-1259	FWD	2060284	2060359	75 MU-776	asnV	asnV	2060284	
TU-1260	FWD	2066659	2066909	250 MU-777	2066552 yoeA	yoeA	2066659	107
TU-1261	FWD	2066934	2067209	275 MU-778	NT			
TU-1262	FWD	2068284	2068509	225 MU-779	2068330 yoeA	yoeA	2068294	-36
TU-1263	FWD	2068584	2069234	650 MU-780	2068543 yeeP	yeeP	2068684	141
TU-1264	FWD	2069434	2069459	25 MU-781	2069348 isrC	isrC	2069339	-9
TU-1265	FWD	2069536	2072686	3150 MU-782	2069496 flu	flu	2069563	67
TU-1266	FWD	2069536	2072686	3150 MU-782	2069533 flu	flu	2069563	30
TU-1267	FWD	2072803	2076131	3328 MU-783	yeeR;yeeS;yeeT;yeeU;yeeV;yeeW	yeeR	2072803	
TU-1268	FWD	2074332	2076131	1799 MU-784	2074114 yeeS;yeeT;yeeU;yeeV;yeeW	yeeS	2074332	218
TU-1269	FWD	2076086	2076136	50 MU-785	2076053 NT			
TU-1270	FWD	2076770	2076955	185 MU-786	yoeF	yoeF	2076770	
TU-1271	FWD	2080786	2082186	1400 MU-787	2080756 sbcB	sbcB	2080780	24
TU-1272	FWD	2087986	2095261	7275 MU-788;MU-789;MU-790	2087989 hisL;hisG;hisD;hisC;hisB;hisH;hisA;hisF;hisI	hisL	2088020	31
TU-1273	FWD	2087986	2095261	7275 MU-788;MU-789;MU-790	2088018 hisL;hisG;hisD;hisC;hisB;hisH;hisA;hisF;hisI	hisL	2088020	2
TU-1274	FWD	2088186	2095261	7075 MU-789;MU-790	2088157 hisG;hisD;hisC;hisB;hisH;hisA;hisF;hisI	hisG	2088216	59

TU-1275	FWD	2088186	2095261	7075 MU-789;MU-790	2088187 hisG;hisD;hisC;hisB;hisH;hisA;hisF;hisI	hisG	2088216	29
TU-1276	FWD	2088186	2095261	7075 MU-789;MU-790	2088197 hisG;hisD;hisC;hisB;hisH;hisA;hisF;hisI	hisG	2088216	19
TU-1277	FWD	2094636	2095261	625 MU-790	2094440 hisI	hisI	2094638	198
TU-1278	FWD	2094636	2095261	625 MU-790	2094579 hisI	hisI	2094638	59
TU-1279	FWD	2135916	2137541	1625 MU-791	2135887 yegH	yegH	2135926	39
TU-1280	FWD	2137591	2137691	100 MU-792	2137557 NT			
TU-1281	FWD	2141266	2144541	3275 MU-793	2141248 yegE	yegE	2141290	42
TU-1282	FWD	2141266	2144541	3275 MU-793	2141382 yegE	yegE	2141290	-92
TU-1283	FWD	2145716	2146991	1275 MU-794	2145873 yegD	yegD	2145698	-175
TU-1284	FWD	2149209	2149670	461 MU-795	yegJ	yegJ	2149209	
TU-1285	FWD	2151241	2151441	200 MU-796	2151335 ryeC	ryeC	2151333	-2
TU-1286	FWD	2151691	2151841	150 MU-797	2151670 ryeD	ryeD	2151668	-2
TU-1287	FWD	2152066	2163016	10950 MU-798;MU-799;MU-800	2152003 mdtA;mdtB;mdtC;mdtD;baeS;baeR	mdtA	2152040	37
TU-1288	FWD	2159266	2163016	3750 MU-799;MU-800	2159215 mdtD;baeS;baeR	mdtD	2159488	273
TU-1289	FWD	2159266	2163016	3750 MU-799;MU-800	2159276 mdtD;baeS;baeR	mdtD	2159488	212
TU-1290	FWD	2162291	2163016	725 MU-800	2162220 baeR	baeR	2162300	80
TU-1291	FWD	2163166	2163591	425 MU-801	2163156 yegP	yegP	2163213	57
TU-1292	FWD	2163616	2165041	1425 MU-802	2163618 yegQ	yegQ	2163692	74
TU-1293	FWD	2165116	2165166	50 MU-803	2165138 ryeE	ryeE	2165136	-2
TU-1294	FWD	2166741	2167591	850 MU-804	2166709 yegS	yegS	2166736	27
TU-1295	FWD	2168216	2169541	1325 MU-805	insE;insF	insE	2168251	
TU-1296	FWD	2176843	2180083	3240 MU-806	yegT;yegU;yegV	yegT	2176843	
TU-1297	FWD	2183966	2184591	625 MU-807	2183945 rcnA	rcnA	2183939	-6
TU-1298	FWD	2183966	2184591	625 MU-807	2183960 rcnA	rcnA	2183939	-21
TU-1299	FWD	2184916	2185266	350 MU-808	2184884 yohN	yohN	2184982	98
TU-1300	FWD	2184916	2185266	350 MU-808	2184935 yohN	yohN	2184982	47
TU-1301	FWD	2192291	2194341	2050 MU-809	2192291 metG	metG	2192322	31
TU-1302	FWD	2194496	2202311	7815 MU-810	yehH;yehI;yehK	yehH	2194496	
TU-1303	FWD	2202618	2209122	6504 MU-811	yehL;yehM;yehP;yehQ	yehL	2202618	
TU-1304	FWD	2209247	2209708	461 MU-812	yehR	yehR	2209247	
TU-1305	FWD	2212793	2213593	800 MU-813	2212711 mlrA	mlrA	2212888	177
TU-1306	FWD	2213693	2213868	175 MU-814	2213656 yohO	yohO	2213679	23
TU-1307	FWD	2216118	2216318	200 MU-815	2216103 NT			
TU-1308	FWD	2220143	2221968	1825 MU-816	2220176 dld	dld	2220207	31
TU-1309	FWD	2223818	2224443	625 MU-817	2223799 yohD	yohD	2223823	24
TU-1310	FWD	2226993	2227468	475 MU-818	2226980 NT			
TU-1311	FWD	2228543	2229443	900 MU-819	2228625 yohJ;yohK	yohJ	2228646	21
TU-1312	FWD	2229468	2230668	1200 MU-820	2229842 cdd	cdd	2229866	24
TU-1313	FWD	2230918	2231818	900 MU-821	2230872 sanA;yeiS	sanA	2230900	28
TU-1314	FWD	2232018	2234496	2478 MU-822	2232004 yeiT;yeiA	yeiT	2232055	51
TU-1315	FWD	2232018	2234496	2478 MU-822	2232009 yeiT;yeiA	yeiT	2232055	46
TU-1316	FWD	2241846	2242671	825 MU-823	2241903 yeiG	yeiG	2241932	29
TU-1317	FWD	2247971	2248446	475 MU-824	2247690 yeiH	yeiH	2247739	49
TU-1318	FWD	2248746	2250646	1900 MU-825	2248828 nfo;yeiI	nfo	2248862	34
TU-1319	FWD	2253377	2254036	659 MU-826	2253259 yeiL	yeiL	2253377	118
TU-1320	FWD	2261885	2263066	1181 MU-827	setB	setB	2261885	

TU-1321	FWD	2262871	2263371	500 MU-828	2262767 NT				
TU-1322	FWD	2263421	2264021	600 MU-829	2263437 yeiP	yeiP	2263472		35
TU-1323	FWD	2263421	2264021	600 MU-829	2263442 yeiP	yeiP	2263472		30
TU-1324	FWD	2263421	2264021	600 MU-829	2263448 yeiP	yeiP	2263472		24
TU-1325	FWD	2263421	2264021	600 MU-829	2263464 yeiP	yeiP	2263472		8
TU-1326	FWD	2264296	2265696	1400 MU-830	2264236 yeiQ	yeiQ	2264267		31
TU-1327	FWD	2265846	2267496	1650 MU-831	2265820 yeiR;lpdT	yeiR	2265851		31
TU-1328	FWD	2267846	2268596	750 MU-832	2267942 spr	spr	2268001		59
TU-1329	FWD	2267846	2268596	750 MU-832	2267949 spr	spr	2268001		52
TU-1330	FWD	2267846	2268596	750 MU-832	2267996 spr	spr	2268001		5
TU-1331	FWD	2268621	2270171	1550 MU-833	2268700 rtn	rtn	2268748		48
TU-1332	FWD	2270371	2275796	5425 MU-834;MU-835;MU-836	2270390 yejA;yejB;yejE;yejF	yejA	2270386		-4
TU-1333	FWD	2271946	2275796	3850 MU-835;MU-836	2271987 yejB;yejE;yejF	yejB	2272201		214
TU-1334	FWD	2273121	2275796	2675 MU-836	2273017 yejE;yejF	yejE	2273295		278
TU-1335	FWD	2273121	2275796	2675 MU-836	2273178 yejE;yejF	yejE	2273295		117
TU-1336	FWD	2276421	2277471	1050 MU-837	2276513 NT				
TU-1337	FWD	2278621	2280196	1575 MU-838	2278630 yejH	yejH	2278654		24
TU-1338	FWD	2280471	2280821	350 MU-839	2280402 rplY	rplY	2280539		137
TU-1339	FWD	2282022	2284122	2100 MU-840	2282124 yejL;yejM	yejL	2282151		27
TU-1340	FWD	2284197	2284297	100 MU-841	2284233 proL	proL	2284233		0
TU-1341	FWD	2288388	2289388	1000 MU-842	2288371 narP	narP	2288522		151
TU-1342	FWD	2288388	2289388	1000 MU-842	2288391 narP	narP	2288522		131
TU-1343	FWD	2288388	2289388	1000 MU-842	2288444 narP	narP	2288522		78
TU-1344	FWD	2301663	2301688	25 MU-843	2301615 yojO	yojO	2301628		13
TU-1345	FWD	2301863	2303063	1200 MU-844	2301894 eco	eco	2301927		33
TU-1346	FWD	2307050	2307150	100 MU-845	2307005 NT				
TU-1347	FWD	2311125	2311175	50 MU-846	2311106 micF	micF	2311106		0
TU-1348	FWD	2311500	2313875	2375 MU-847	2311474 rcsD	rcsD	2311510		36
TU-1349	FWD	2313900	2314925	1025 MU-848	2314084 rcsB	rcsB	2314199		115
TU-1350	FWD	2313900	2314925	1025 MU-848	2314140 rcsB	rcsB	2314199		59
TU-1351	FWD	2318075	2320425	2350 MU-849	2318037 atoS;atoC	atoS	2318065		28
TU-1352	FWD	2321469	2325315	3846 MU-850	atoD;atoA;atoE;atoB	atoD	2321469		
TU-1353	FWD	2337575	2338475	900 MU-851	2337562 ubiG	ubiG	2337589		27
TU-1354	FWD	2339250	2339425	175 MU-852	2339227 NT				
TU-1355	FWD	2342800	2346725	3925 MU-853;MU-854	2342780 nrdA;nrdB;yfaE	nrdA	2342887		107
TU-1356	FWD	2345275	2346725	1450 MU-854	2345374 nrdB;yfaE	nrdB	2345406		32
TU-1357	FWD	2347673	2347915	242 MU-855	yfaH	yfaH	2347673		
TU-1358	FWD	2348025	2348225	200 MU-856	2347962 NT				
TU-1359	FWD	2350728	2354178	3450 MU-857	2350615 glpA;glpB;glpC	glpA	2350669		54
TU-1360	FWD	2354926	2355825	899 MU-858	yfaD	yfaD	2354926		
TU-1361	FWD	2355604	2356154	550 MU-859	2355575 ypaA	ypaA	2355838		263
TU-1362	FWD	2362604	2362854	250 MU-860	2362549 nudI	nudI	2362576		27
TU-1363	FWD	2363879	2371279	7400 MU-861;MU-862;MU-863	2363738 arnB;arnC;arnA;arnD;arnT;arnE;arnF	arnB	2363950		212
TU-1364	FWD	2367379	2371279	3900 MU-862;MU-863	2367286 arnD;arnT;arnE;arnF	arnD	2368040		754
TU-1365	FWD	2367379	2371279	3900 MU-862;MU-863	2367400 arnD;arnT;arnE;arnF	arnD	2368040		640
TU-1366	FWD	2370254	2371279	1025 MU-863	2370154 arnE;arnF	arnE	2370579		425

TU-1367	FWD	2379629	2380504	875 MU-864	2379604 rbn	rbn	2379630	26
TU-1368	FWD	2379629	2380504	875 MU-864	2379610 rbn	rbn	2379630	20
TU-1369	FWD	2380735	2381946	1211 MU-865	elaD	elaD	2380735	
TU-1370	FWD	2383882	2385459	1577 MU-866	2383830 yfbL;yfbM	yfbL	2383882	52
TU-1371	FWD	2386630	2388005	1375 MU-867	2386595 yfbO;yfbP	yfbO	2386603	8
TU-1372	FWD	2405547	2407697	2150 MU-868;MU-869	2405531 yfbQ;yfbR	yfbQ	2405583	52
TU-1373	FWD	2406897	2407697	800 MU-869	2406858 yfbR	yfbR	2406884	26
TU-1374	FWD	2411297	2414872	3575 MU-870;MU-871	2411366 ackA;pta	ackA	2411492	126
TU-1375	FWD	2411297	2412697	1400 MU-870	2411459 ackA;pta	ackA	2411492	33
TU-1376	FWD	2412747	2414872	2125 MU-871	2412727 pta	pta	2412769	42
TU-1377	FWD	2415122	2416472	1350 MU-872	yfcC	yfcC	2415103	
TU-1378	FWD	2418647	2419222	575 MU-873	2418614 yfcG	yfcG	2418643	29
TU-1379	FWD	2419272	2420747	1475 MU-874;MU-875	2419323 folX;yfcH	folX	2419347	24
TU-1380	FWD	2419722	2420747	1025 MU-875	2419630 yfcH	yfcH	2419730	100
TU-1381	FWD	2435947	2437022	1075 MU-876	2435951 flk	flk	2435972	21
TU-1382	FWD	2439797	2441822	2025 MU-877	2439761 mnmC	mnmC	2439786	25
TU-1383	FWD	2446498	2447298	800 MU-878	2446603 yfcN	yfcN	2446628	25
TU-1384	FWD	2459250	2460625	1375 MU-879	2459227 fadL	fadL	2459328	101
TU-1385	FWD	2461034	2462092	1058 MU-880	yfdF	yfdF	2461034	
TU-1386	FWD	2463328	2464228	900 MU-881	2463296 yfdC	yfdC	2463323	27
TU-1387	FWD	2464353	2464428	75 MU-882	2464331 argW	argW	2464331	0
TU-1388	FWD	2464578	2465778	1200 MU-883	2464537 intS	intS	2464567	30
TU-1389	FWD	2464578	2465778	1200 MU-883	2464558 intS	intS	2464567	9
TU-1390	FWD	2465878	2468403	2525 MU-884;MU-885	2465852 yfdG;yfdH;yfdI	yfdG	2465877	25
TU-1391	FWD	2465878	2468403	2525 MU-884;MU-885	2465858 yfdG;yfdH;yfdI	yfdG	2465877	19
TU-1392	FWD	2466953	2468403	1450 MU-885	2467044 yfdI	yfdI	2467153	109
TU-1393	FWD	2466953	2468403	1450 MU-885	2467055 yfdI	yfdI	2467153	98
TU-1394	FWD	2468778	2469228	450 MU-886	2468770 tfaS	tfaS	2468837	67
TU-1395	FWD	2471626	2474253	2627 MU-887	yfdP;yfdQ;yfdR;yfdS;yfdT;ypdJ	yfdP	2471626	
TU-1396	FWD	2474278	2474553	275 MU-888	torI	torI	2474332	
TU-1397	FWD	2474606	2474620	14 MU-889	pawZ	pawZ	2474606	
TU-1398	FWD	2475869	2478128	2259 MU-890;MU-891	dsdX;dsdA	dsdX	2475869	
TU-1399	FWD	2477078	2478128	1050 MU-891	2477127 dsdA	dsdA	2477224	97
TU-1400	FWD	2477078	2478128	1050 MU-891	2477132 dsdA	dsdA	2477224	92
TU-1401	FWD	2481679	2483754	2075 MU-892	2481652 evgA;evgS	evgA	2481777	125
TU-1402	FWD	2481679	2483754	2075 MU-892	2481663 evgA;evgS	evgA	2481777	114
TU-1403	FWD	2484079	2485704	1625 MU-893	2483950 NT			
TU-1404	FWD	2492720	2492995	275 MU-894	ypdI	ypdI	2492720	
TU-1405	FWD	2493529	2493779	250 MU-895	2493621 lpxP	lpxP	2493667	46
TU-1406	FWD	2494829	2495004	175 MU-896	2494819 NT			
TU-1407	FWD	2497029	2499129	2100 MU-897	2496668 ypdA;ypdB	ypdA	2496693	25
TU-1408	FWD	2499204	2499879	675 MU-898	2499128 ypdC	ypdC	2499152	24
TU-1409	FWD	2507529	2508879	1350 MU-899	2507477 yfeO	yfeO	2507652	175
TU-1410	FWD	2508954	2509404	450 MU-900	2508983 ypeC	ypeC	2509023	40
TU-1411	FWD	2510829	2512379	1550 MU-901	2510904 nupC	nupC	2511064	160
TU-1412	FWD	2510829	2512379	1550 MU-901	2511000 nupC	nupC	2511064	64

TU-1413	FWD	2510829	2512379	1550 MU-901	2511032 nupC	nupC	2511064	32
TU-1414	FWD	2512404	2513604	1200 MU-902	2512273 insL	insL	2512353	80
TU-1415	FWD	2516479	2517204	725 MU-903	2516429 yfeC;yfeD	yfeC	2516489	60
TU-1416	FWD	2516479	2517204	725 MU-903	2516468 yfeC;yfeD	yfeC	2516489	21
TU-1417	FWD	2518929	2519504	575 MU-904	2518953 valU;valX;valY;lysV	valU	2518953	0
TU-1418	FWD	2523180	2523881	701 MU-905	2523196 yfeN	yfeN	2523149	-47
TU-1419	FWD	2524956	2526106	1150 MU-906	2524948 yfeH	yfeH	2524968	20
TU-1420	FWD	2529481	2530131	650 MU-907	2529446 cysZ	cysZ	2529485	39
TU-1421	FWD	2530381	2531581	1200 MU-908	2530399 cysK	cysK	2530431	32
TU-1422	FWD	2530381	2531581	1200 MU-908	2530408 cysK	cysK	2530431	23
TU-1423	FWD	2530381	2531581	1200 MU-908	2530418 cysK	cysK	2530431	13
TU-1424	FWD	2531606	2534381	2775 MU-909;MU-910	2531523 ptsH;ptsI;crr	ptsH	2531786	263
TU-1425	FWD	2531606	2534381	2775 MU-909;MU-910	2531529 ptsH;ptsI;crr	ptsH	2531786	257
TU-1426	FWD	2531606	2534381	2775 MU-909;MU-910	2531614 ptsH;ptsI;crr	ptsH	2531786	172
TU-1427	FWD	2531606	2534381	2775 MU-909;MU-910	2531617 ptsH;ptsI;crr	ptsH	2531786	169
TU-1428	FWD	2531606	2534381	2775 MU-909;MU-910	2531710 ptsH;ptsI;crr	ptsH	2531786	76
TU-1429	FWD	2531606	2534381	2775 MU-909;MU-910	2531713 ptsH;ptsI;crr	ptsH	2531786	73
TU-1430	FWD	2531606	2534381	2775 MU-909;MU-910	2531754 ptsH;ptsI;crr	ptsH	2531786	32
TU-1431	FWD	2531606	2534381	2775 MU-909;MU-910	2531757 ptsH;ptsI;crr	ptsH	2531786	29
TU-1432	FWD	2531606	2534381	2775 MU-909;MU-910	2531761 ptsH;ptsI;crr	ptsH	2531786	25
TU-1433	FWD	2533606	2534381	775 MU-910	2533502 crr	crr	2533856	354
TU-1434	FWD	2533606	2534381	775 MU-910	2533632 crr	crr	2533856	224
TU-1435	FWD	2533606	2534381	775 MU-910	2533789 crr	crr	2533856	67
TU-1436	FWD	2533606	2534381	775 MU-910	2533815 crr	crr	2533856	41
TU-1437	FWD	2533606	2534381	775 MU-910	2533834 crr	crr	2533856	22
TU-1438	FWD	2535431	2535756	325 MU-911	2535337 yfeK	yfeK	2535364	27
TU-1439	FWD	2535856	2536656	800 MU-912	2535779 yfeS	yfeS	2535771	-8
TU-1440	FWD	2541735	2541785	50 MU-913	NT			
TU-1441	FWD	2543810	2545910	2100 MU-914	2543753 murQ;murP	murQ	2543795	42
TU-1442	FWD	2543810	2545910	2100 MU-914	2543763 murQ;murP	murQ	2543795	32
TU-1443	FWD	2546510	2547560	1050 MU-915	2546310 yfeW	yfeW	2546124	-186
TU-1444	FWD	2550310	2552110	1800 MU-916	2550264 amiA;hemF	amiA	2550374	110
TU-1445	FWD	2550310	2552110	1800 MU-916	2550301 amiA;hemF	amiA	2550374	73
TU-1446	FWD	2555360	2555960	600 MU-917	2555334 NT			
TU-1447	FWD	2556810	2558085	1275 MU-918	2556798 intZ	intZ	2556880	82
TU-1448	FWD	2558385	2558860	475 MU-919	2558357 yffL	yffL	2558279	-78
TU-1449	FWD	2558385	2558860	475 MU-919	2558413 yffL	yffL	2558279	-134
TU-1450	FWD	2559390	2560015	625 MU-920	yffM;yffN	yffM	2559390	
TU-1451	FWD	2560136	2561136	1000 MU-921	2560064 yffO;yffP	yffO	2560133	69
TU-1452	FWD	2561586	2561786	200 MU-922	2561495 yffQ	yffQ	2561614	119
TU-1453	FWD	2561936	2562461	525 MU-923	2561969 yffR	yffR	2562002	33
TU-1454	FWD	2561936	2562461	525 MU-923	2561982 yffR	yffR	2562002	20
TU-1455	FWD	2562561	2563311	750 MU-924	2562517 yffS	yffS	2562545	28
TU-1456	FWD	2570187	2570462	275 MU-925	NT			
TU-1457	FWD	2576637	2579762	3125 MU-926	2576628 talA;tktB	talA	2576688	60
TU-1458	FWD	2576637	2579762	3125 MU-926	2576664 talA;tktB	talA	2576688	24



TU-1459	FWD	2583613	2585113	1500 MU-927	2583542 narQ	narQ	2583753	211
TU-1460	FWD	2583613	2585113	1500 MU-927	2583590 narQ	narQ	2583753	163
TU-1461	FWD	2585563	2587788	2225 MU-928	2585611 acrD	acrD	2585617	6
TU-1462	FWD	2589188	2591263	2075 MU-929;MU-930;MU-931	2589198 yffB;dapE;ypfN	yffB	2589269	71
TU-1463	FWD	2589438	2591263	1825 MU-930;MU-931	2589582 dapE;ypfN	dapE	2589629	47
TU-1464	FWD	2590713	2591263	550 MU-931	2590733 ypfN	ypfN	2590784	51
TU-1465	FWD	2594813	2594988	175 MU-932	2594784 NT			
TU-1466	FWD	2597863	2598963	1100 MU-933;MU-934	2597901 gcvR;bcp	gcvR	2597928	27
TU-1467	FWD	2598438	2598963	525 MU-934	2598431 bcp	bcp	2598500	69
TU-1468	FWD	2598438	2598963	525 MU-934	2598450 bcp	bcp	2598500	50
TU-1469	FWD	2598438	2598963	525 MU-934	2598459 bcp	bcp	2598500	41
TU-1470	FWD	2598438	2598963	525 MU-934	2598466 bcp	bcp	2598500	34
TU-1471	FWD	2599223	2612804	13581 MU-935	hyfA;hyfB;hyfC;hyfD;hyfE;hyfF;hyfG;hyfH;hyfI;hyfJ;hyfR;focB	hyfA	2599223	
TU-1472	FWD	2614040	2616065	2025 MU-936	2614048 yfgC;yfgD	yfgC	2614116	68
TU-1473	FWD	2614040	2616065	2025 MU-936	2614090 yfgC;yfgD	yfgC	2614116	26
TU-1474	FWD	2619191	2620891	1700 MU-937	2619175 purM;purN	purM	2619219	44
TU-1475	FWD	2620966	2624653	3687 MU-938	2620970 ppk;ppx	ppk	2621066	96
TU-1476	FWD	2620966	2624653	3687 MU-938	2620980 ppk;ppx	ppk	2621066	86
TU-1477	FWD	2626078	2626153	75 MU-939	2626040 NT			
TU-1478	FWD	2627303	2627503	200 MU-940	2627274 yfgG	yfgG	2627312	38
TU-1479	FWD	2627878	2628853	975 MU-941	2627785 yfgH;yfgI	yfgH	2627814	29
TU-1480	FWD	2632253	2633753	1500 MU-942	2632219 xseA	xseA	2632254	35
TU-1481	FWD	2650430	2651355	925 MU-943	2650491 sseA	sseA	2650516	25
TU-1482	FWD	2651537	2651745	208 MU-944	IS128	IS128	2651537	
TU-1483	FWD	2651899	2652149	250 MU-945	2651867 ryfA	ryfA	2651877	10
TU-1484	FWD	2661452	2662202	750 MU-946	2661428 suhB	suhB	2661464	36
TU-1485	FWD	2661452	2662202	750 MU-946	2661437 suhB	suhB	2661464	27
TU-1486	FWD	2662385	2663266	881 MU-947	yfhR	yfhR	2662385	
TU-1487	FWD	2663452	2664952	1500 MU-948	2663423 csiE	csiE	2663457	34
TU-1488	FWD	2666202	2666327	125 MU-949	2666220 NT			
TU-1489	FWD	2667227	2671777	4550 MU-950;MU-951	2667041 hcaE;hcaF;hcaC;hcaB;hcaD;yphA	hcaE	2667054	13
TU-1490	FWD	2671302	2671777	475 MU-951	2671343 yphA	yphA	2671368	25
TU-1491	FWD	2680827	2682077	1250 MU-952	2680827 yphH	yphH	2680885	58
TU-1492	FWD	2682152	2682252	100 MU-953	2682044 NT			
TU-1493	FWD	2683852	2685052	1200 MU-954	2683819 hmp	hmp	2683857	38
TU-1494	FWD	2683852	2685052	1200 MU-954	2683831 hmp	hmp	2683857	26
TU-1495	FWD	2693777	2694952	1175 MU-955	2693782 yfhD	yfhD	2693823	41
TU-1496	FWD	2696727	2698002	1275 MU-956;MU-957	2696762 yfhH;yfhL	yfhH	2696781	19
TU-1497	FWD	2697652	2698002	350 MU-957	2697658 yfhL	yfhL	2697685	27
TU-1498	FWD	2697652	2698002	350 MU-957	2697678 yfhL	yfhL	2697685	7
TU-1499	FWD	2698542	2698618	76 MU-958	ryfC	ryfC	2698542	
TU-1500	FWD	2708439	2710114	1675 MU-959	2708414 nadB	nadB	2708442	28
TU-1501	FWD	2710789	2712414	1625 MU-960	2710900 srmB	srmB	2710918	18
TU-1502	FWD	2713445	2714032	587 MU-961	eamB	eamB	2713445	
TU-1503	FWD	2714764	2715564	800 MU-962	2714752 ung	ung	2714776	24

TU-1504	FWD	2716714	2717164	450 MU-963	2716697 trxC	trxC	2716757	60
TU-1505	FWD	2717264	2720264	3000 MU-964	2717227 yfiP;yfiQ	yfiP	2717245	18
TU-1506	FWD	2720314	2722089	1775 MU-965;MU-966	2720309 pssA	pssA	2720749	440
TU-1507	FWD	2720664	2722089	1425 MU-966	2720643 pssA	pssA	2720749	106
TU-1508	FWD	2720664	2722089	1425 MU-966	2720648 pssA	pssA	2720749	101
TU-1509	FWD	2720664	2722089	1425 MU-966	2720691 pssA	pssA	2720749	58
TU-1510	FWD	2722150	2722473	323 MU-967	yfiM	yfiM	2722150	
TU-1511	FWD	2723890	2724040	150 MU-968	2723856 NT			
TU-1512	FWD	2733994	2734894	900 MU-969	2733982 bamD	bamD	2734168	186
TU-1513	FWD	2733994	2734894	900 MU-969	2734095 bamD	bamD	2734168	73
TU-1514	FWD	2733994	2734894	900 MU-969	2734107 bamD	bamD	2734168	61
TU-1515	FWD	2733994	2734894	900 MU-969	2734135 bamD	bamD	2734168	33
TU-1516	FWD	2735144	2735569	425 MU-970	2735146 raiA	raiA	2735176	30
TU-1517	FWD	2735144	2735569	425 MU-970	2735152 raiA	raiA	2735176	24
TU-1518	FWD	2735619	2736819	1200 MU-971	2735602 pheL;pheA	pheL	2735621	19
TU-1519	FWD	2739394	2739744	350 MU-972	2739371 yfiL	yfiL	2739382	11
TU-1520	FWD	2739869	2742119	2250 MU-973	2739846 yfiR;yfiN;yfiB	yfiR	2739897	51
TU-1521	FWD	2745970	2747970	2000 MU-974	2745953 ypjD;yfjD	ypjD	2745984	31
TU-1522	FWD	2748745	2749645	900 MU-975	2748759 nadK	nadK	2748853	94
TU-1523	FWD	2748745	2749645	900 MU-975	2748788 nadK	nadK	2748853	65
TU-1524	FWD	2749820	2751470	1650 MU-976	2749782 recN	recN	2749817	35
TU-1525	FWD	2749820	2751470	1650 MU-976	2749795 recN	recN	2749817	22
TU-1526	FWD	2751520	2751970	450 MU-977	2751510 smpA	smpA	2751627	117
TU-1527	FWD	2751520	2751970	450 MU-977	2751542 smpA	smpA	2751627	85
TU-1528	FWD	2751520	2751970	450 MU-977	2751577 smpA	smpA	2751627	50
TU-1529	FWD	2751520	2751970	450 MU-977	2751616 smpA	smpA	2751627	11
TU-1530	FWD	2752820	2753495	675 MU-978	2752854 smpB	smpB	2752918	64
TU-1531	FWD	2752820	2753495	675 MU-978	2752896 smpB	smpB	2752918	22
TU-1532	FWD	2753620	2754020	400 MU-979	2753615 ssrA	ssrA	2753615	0
TU-1533	FWD	2754170	2755370	1200 MU-980	2754155 intA	intA	2754181	26
TU-1534	FWD	2754170	2755370	1200 MU-980	2754190 intA	intA	2754181	-9
TU-1535	FWD	2755920	2756070	150 MU-981	NT			
TU-1536	FWD	2756666	2756878	212 MU-982	2756635 alpA	alpA	2756666	31
TU-1537	FWD	2757007	2759195	2188 MU-983	yfjI;yfjJ	yfjI	2757007	
TU-1538	FWD	2763411	2763811	400 MU-984	2763238 NT			
TU-1539	FWD	2763936	2764486	550 MU-985	2763916 rnlA	rnlA	2763940	24
TU-1540	FWD	2763936	2764486	550 MU-985	2763922 rnlA	rnlA	2763940	18
TU-1541	FWD	2764511	2765461	950 MU-986	2764659 yfjO	yfjO	2765006	347
TU-1542	FWD	2764511	2765461	950 MU-986	2764729 yfjO	yfjO	2765006	277
TU-1543	FWD	2766092	2766592	500 MU-987	yfjP;yfjQ	yfjP	2765732	
TU-1544	FWD	2767725	2769637	1912 MU-988	yfjR;ypjK;yfjS;yfjT	yfjR	2767725	
TU-1545	FWD	2769842	2770167	325 MU-989	2769830 NT			
TU-1546	FWD	2771242	2772842	1600 MU-990	2771308 yfjW	yfjW	2771340	32
TU-1547	FWD	2773417	2773492	75 MU-991	2773413 NT			
TU-1548	FWD	2773567	2775804	2237 MU-992	ypjI;yfjX;yfjY;ypjJ;yfjZ;ypjF	ypjI	2773567	
TU-1549	FWD	2775792	2776043	251 MU-993	2775809 psaA	psaA	2775994	185

TU-1550	FWD	2776893	2776993	100 MU-994	2776786 NT			
TU-1551	FWD	2784419	2786671	2252 MU-995	ygaQ	ygaQ	2784419	
TU-1552	FWD	2786976	2794352	7376 MU-996;MU-997;MU-998	2786949 csiD;ygaF;gabD;gabT;gabP;csiR	csiD	2787007	58
TU-1553	FWD	2788851	2794352	5501 MU-997;MU-998	2788933 gabD;gabT;gabP;csiR	gabD	2789295	362
TU-1554	FWD	2788851	2794352	5501 MU-997;MU-998	2788948 gabD;gabT;gabP;csiR	gabD	2789295	347
TU-1555	FWD	2793702	2794352	650 MU-998	2793646 csiR	csiR	2793696	50
TU-1556	FWD	2795252	2796027	775 MU-999	2795209 ygaV;ygaP	ygaV	2795233	24
TU-1557	FWD	2795252	2796027	775 MU-999	2795219 ygaV;ygaP	ygaV	2795233	14
TU-1558	FWD	2797127	2797902	775 MU-1000	2797144 ygaW	ygaW	2797186	42
TU-1559	FWD	2798177	2798502	325 MU-1001	2798143 ygaM	ygaM	2798156	13
TU-1560	FWD	2798177	2798502	325 MU-1001	2798150 ygaM	ygaM	2798156	6
TU-1561	FWD	2798702	2802478	3776 MU-1002	2798678 nrdH;nrdI;nrdE;nrdF	nrdH	2798745	67
TU-1562	FWD	2802828	2806028	3200 MU-1003	2802587 proV;proW;proX	proV	2802837	250
TU-1563	FWD	2802828	2806028	3200 MU-1003	2802771 proV;proW;proX	proV	2802837	66
TU-1564	FWD	2802828	2806028	3200 MU-1003	2802782 proV;proW;proX	proV	2802837	55
TU-1565	FWD	2806338	2807515	1177 MU-1004	ygaY	ygaY	2806338	
TU-1566	FWD	2807628	2808828	1200 MU-1005	2807591 ygaZ;ygaH	ygaZ	2807639	48
TU-1567	FWD	2807628	2808828	1200 MU-1005	2807602 ygaZ;ygaH	ygaZ	2807639	37
TU-1568	FWD	2807628	2808828	1200 MU-1005	2807710 ygaZ;ygaH	ygaZ	2807639	-71
TU-1569	FWD	2808853	2810103	1250 MU-1006	2808717 mprA	mprA	2808792	75
TU-1570	FWD	2808853	2810103	1250 MU-1006	2808741 mprA	mprA	2808792	51
TU-1571	FWD	2808853	2810103	1250 MU-1006	2808755 mprA	mprA	2808792	37
TU-1572	FWD	2808853	2810103	1250 MU-1006	2808768 mprA	mprA	2808792	24
TU-1573	FWD	2810128	2812178	2050 MU-1007	2809360 emrA;emrB	emrA	2809449	89
TU-1574	FWD	2812831	2812856	25 MU-1008	2812824 micA	micA	2812824	0
TU-1575	FWD	2823906	2826281	2375 MU-1009	2823750 srlA;srlE;srlB;srlD	srlA	2823854	104
TU-1576	FWD	2823906	2826281	2375 MU-1009	2823813 srlA;srlE;srlB;srlD	srlA	2823854	41
TU-1577	FWD	2826643	2827002	359 MU-1010	gutM	gutM	2826643	
TU-1578	FWD	2826981	2828756	1775 MU-1011;MU-1012	2826984 srlR;gutQ	srlR	2827069	85
TU-1579	FWD	2827781	2828756	975 MU-1012	2827732 gutQ	gutQ	2827835	103
TU-1580	FWD	2830756	2831056	300 MU-1013	2830462 norV;norW;C0664	norV	2830498	36
TU-1581	FWD	2835331	2835456	125 MU-1014	2835275 NT			
TU-1582	FWD	2837481	2840481	3000 MU-1015	2837449 ascF;ascB	ascF	2837546	97
TU-1583	FWD	2848706	2854256	5550 MU-1016;MU-1017;MU-1018	2848861 hypA;hypB;hypC;hypD;hypE;fhIA	hypA	2848669	-192
TU-1584	FWD	2850706	2854256	3550 MU-1017;MU-1018	2850757 hypE;fhIA	hypE	2851318	561
TU-1585	FWD	2852331	2854256	1925 MU-1018	2852316 fhIA	fhIA	2852360	44
TU-1586	FWD	2852331	2854256	1925 MU-1018	2852323 fhIA	fhIA	2852360	37
TU-1587	FWD	2855081	2857731	2650 MU-1019	2855046 mutS	mutS	2855115	69
TU-1588	FWD	2855081	2857731	2650 MU-1019	2855085 mutS	mutS	2855115	30
TU-1589	FWD	2855081	2857731	2650 MU-1019	2855105 mutS	mutS	2855115	10
TU-1590	FWD	2855081	2857731	2650 MU-1019	2855132 mutS	mutS	2855115	-17
TU-1591	FWD	2857782	2858438	656 MU-1020	pphB	pphB	2857782	
TU-1592	FWD	2859457	2864407	4950 MU-1021	2859414 ygbJ;ygbK;ygbL;ygbM;ygbN	ygbJ	2859452	38
TU-1593	FWD	2865857	2865932	75 MU-1022	2865777 NT			
TU-1594	FWD	2874607	2875632	1025 MU-1023	2874569 iap	iap	2874603	34
TU-1595	FWD	2890253	2892703	2450 MU-1024	2890212 sscR;ygcN;ygcO;ygcP	sscR	2890236	24

TU-1596	FWD	2898614	2901396	2782 MU-1025	yqcE;ygcE	yqcE	2898614	
TU-1597	FWD	2901938	2902488	550 MU-1026	2902008 NT			
TU-1598	FWD	2903733	2904605	872 MU-1027	ygcG	ygcG	2903733	
TU-1599	FWD	2912813	2915838	3025 MU-1028	2912910 barA	barA	2913079	169
TU-1600	FWD	2923363	2924213	850 MU-1029	2923341 queF	queF	2923370	29
TU-1601	FWD	2924263	2925688	1425 MU-1030	2924294 ygdH	ygdH	2924330	36
TU-1602	FWD	2926165	2929815	3650 MU-1031	2926172 sdaC;sdaB;ygdG	sdaC	2926251	79
TU-1603	FWD	2926165	2929815	3650 MU-1031	2926178 sdaC;sdaB;ygdG	sdaC	2926251	73
TU-1604	FWD	2926165	2929815	3650 MU-1031	2926223 sdaC;sdaB;ygdG	sdaC	2926251	28
TU-1605	FWD	2932257	2936908	4651 MU-1032	fucP;fucI;fucK	fucP	2932257	
TU-1606	FWD	2936515	2938123	1608 MU-1033	2936466 fucU;fucR	fucU	2936910	444
TU-1607	FWD	2936515	2938123	1608 MU-1033	2936671 fucU;fucR	fucU	2936910	239
TU-1608	FWD	2940748	2940848	100 MU-1034	2940718 gcvB	gcvB	2940718	0
TU-1609	FWD	2941348	2942998	1650 MU-1035;MU-1036	2941341 csdA;csdE	csdA	2941359	18
TU-1610	FWD	2942373	2942998	625 MU-1036	2942505 csdE	csdE	2942564	59
TU-1611	FWD	2943923	2944023	100 MU-1037	NT			
TU-1612	FWD	2945423	2945498	75 MU-1038	2945409 metZ;metW;metV	metZ	2945409	0
TU-1613	FWD	2947223	2949273	2050 MU-1039	2947233 argA	argA	2947264	31
TU-1614	FWD	2947223	2949273	2050 MU-1039	2947241 argA	argA	2947264	23
TU-1615	FWD	2967600	2968275	675 MU-1040	2967638 mutH	mutH	2967684	46
TU-1616	FWD	2968450	2968925	475 MU-1041	2968416 ygdQ	ygdQ	2968442	26
TU-1617	FWD	2969300	2969500	200 MU-1042	2969260 ygdR	ygdR	2969293	33
TU-1618	FWD	2969300	2969500	200 MU-1042	2969272 ygdR	ygdR	2969293	21
TU-1619	FWD	2969575	2970778	1203 MU-1043	2969587 tas	tas	2969619	32
TU-1620	FWD	2974578	2975778	1200 MU-1044	2974591 galR	galR	2974621	30
TU-1621	FWD	2977028	2977903	875 MU-1045	2976932 lysR	lysR	2977043	111
TU-1622	FWD	2980503	2980778	275 MU-1046	2980467 NT			
TU-1623	FWD	2981553	2981853	300 MU-1047	NT			
TU-1624	FWD	2983869	2985098	1229 MU-1048	2983673 yqeG	yqeG	2983869	196
TU-1625	FWD	2985558	2986190	632 MU-1049	2985533 yqeH	yqeH	2985558	25
TU-1626	FWD	2986524	2987808	1284 MU-1050	yqeI;yqeJ	yqeI	2986524	
TU-1627	FWD	2988576	2989065	489 MU-1051	2988440 ygeF	ygeF	2988576	136
TU-1628	FWD	2989290	2989781	491 MU-1052	ygeG	ygeG	2989290	
TU-1629	FWD	2990116	2991492	1376 MU-1053	2990004 ygeH	ygeH	2990116	112
TU-1630	FWD	2991660	2991878	218 MU-1054	2991615 ygeI	ygeI	2991660	45
TU-1631	FWD	2991961	2992463	502 MU-1055	pbl	pbl	2991961	
TU-1632	FWD	2994300	2994625	325 MU-1056	NT			
TU-1633	FWD	2998425	3002100	3675 MU-1057	2998296 xdhA;xdhB;xdhC	xdhA	2998367	71
TU-1634	FWD	3005554	3010179	4625 MU-1058	ygeW;ygeX;ygeY;hyuA;yqeA	ygeW	3004284	
TU-1635	FWD	3013129	3013954	825 MU-1059	3013125 ygfJ	ygfJ	3013182	57
TU-1636	FWD	3016154	3021804	5650 MU-1060	ygfK;ssnA;ygfM;xdhD	ygfK	3014082	
TU-1637	FWD	3022373	3023773	1400 MU-1061	ygfO	ygfO	3022373	
TU-1638	FWD	3023729	3026502	2773 MU-1062	3023691 guaD;ygfQ	guaD	3023788	97
TU-1639	FWD	3029389	3030837	1448 MU-1063	ygfU	ygfU	3029389	
TU-1640	FWD	3031077	3031727	650 MU-1064	3031063 idi	idi	3031087	24
TU-1641	FWD	3031077	3031727	650 MU-1064	3031071 idi	idi	3031087	16

TU-1642	FWD	3037877	3038377	500 MU-1065	3037844 fldB	fldB	3037877	33
TU-1643	FWD	3039327	3040677	1350 MU-1066	3039304 ygfZ	ygfZ	3039335	31
TU-1644	FWD	3041627	3043177	1550 MU-1067	3041661 bglA	bglA	3041684	23
TU-1645	FWD	3041627	3043177	1550 MU-1067	3041716 bglA	bglA	3041684	-32
TU-1646	FWD	3053527	3053777	250 MU-1068	3053511 zapA	zapA	3053634	123
TU-1647	FWD	3053802	3054627	825 MU-1069	3053781 ssrS;ygfA	ssrS	3054005	224
TU-1648	FWD	3053802	3054627	825 MU-1069	3053790 ssrS;ygfA	ssrS	3054005	215
TU-1649	FWD	3053802	3054627	825 MU-1069	3053880 ssrS;ygfA	ssrS	3054005	125
TU-1650	FWD	3053802	3054627	825 MU-1069	3053996 ssrS;ygfA	ssrS	3054005	9
TU-1651	FWD	3054902	3055152	250 MU-1070	3054873 rygC	rygC	3054871	-2
TU-1652	FWD	3057777	3058503	726 MU-1071	3057743 argP	argP	3057775	32
TU-1653	FWD	3057777	3058503	726 MU-1071	3057751 argP	argP	3057775	24
TU-1654	FWD	3058872	3064302	5430 MU-1072	scpA;argK;scpB;scpC	scpA	3058872	
TU-1655	FWD	3065058	3065533	475 MU-1073	3065229 NT			
TU-1656	FWD	3079721	3080771	1050 MU-1074	3079905 yggG	yggG	3079935	30
TU-1657	FWD	3084209	3084424	215 MU-1075	yqqC	yqqC	3084209	
TU-1658	FWD	3084624	3085874	1250 MU-1076	3084589 metK	metK	3084728	139
TU-1659	FWD	3084624	3085874	1250 MU-1076	3084613 metK	metK	3084728	115
TU-1660	FWD	3084624	3085874	1250 MU-1076	3084691 metK	metK	3084728	37
TU-1661	FWD	3084624	3085874	1250 MU-1076	3084705 metK	metK	3084728	23
TU-1662	FWD	3084624	3085874	1250 MU-1076	3084711 metK	metK	3084728	17
TU-1663	FWD	3086249	3088974	2725 MU-1077	3086277 galP;yggI;endA	galP	3086306	29
TU-1664	FWD	3089124	3091049	1925 MU-1078	3089091 rsmE;gshB	rsmE	3089156	65
TU-1665	FWD	3089124	3091049	1925 MU-1078	3089097 rsmE;gshB	rsmE	3089156	59
TU-1666	FWD	3091074	3092024	950 MU-1079	3090922 yqqE;yqqF	yqqE	3090959	37
TU-1667	FWD	3091074	3092024	950 MU-1079	3090929 yqqE;yqqF	yqqE	3090959	30
TU-1668	FWD	3093124	3096449	3325 MU-1080;MU-1081	3093082 yggS;yggT;yggU;rdgB;yggW	yggS	3093120	38
TU-1669	FWD	3094624	3096449	1825 MU-1081	3094639 rdgB;yggW	rdgB	3094703	64
TU-1670	FWD	3094624	3096449	1825 MU-1081	3094645 rdgB;yggW	rdgB	3094703	58
TU-1671	FWD	3096574	3096599	25 MU-1082	3096582 NT			
TU-1672	FWD	3098699	3098874	175 MU-1083	NT			
TU-1673	FWD	3101024	3102049	1025 MU-1084	3101011 mutY	mutY	3101035	24
TU-1674	FWD	3101024	3102049	1025 MU-1084	3101024 mutY	mutY	3101035	11
TU-1675	FWD	3102074	3103524	1450 MU-1085	3102014 yggX;mltC	yggX	3102115	101
TU-1676	FWD	3102074	3103524	1450 MU-1085	3102064 yggX;mltC	yggX	3102115	51
TU-1677	FWD	3103699	3104624	925 MU-1086	3103673 nupG	nupG	3103736	63
TU-1678	FWD	3107238	3108288	1050 MU-1087	3107546 yqqA	yqqA	3107575	29
TU-1679	FWD	3108413	3108463	50 MU-1088	3108436 pheV	pheV	3108388	-48
TU-1680	FWD	3109263	3109588	325 MU-1089	3109328 NT			
TU-1681	FWD	3119263	3119613	350 MU-1090	3119402 C0719	C0719	3119380	-22
TU-1682	FWD	3126238	3127213	975 MU-1091	3126227 glcC	glcC	3126294	67
TU-1683	FWD	3128163	3129238	1075 MU-1092	3128104 insH	insH	3128200	96
TU-1684	FWD	3132153	3132845	692 MU-1093	yghT	yghT	3132153	
TU-1685	FWD	3136738	3137738	1000 MU-1094	3136722 yghU	yghU	3136749	27
TU-1686	FWD	3145913	3147038	1125 MU-1095	3145884 yghZ	yghZ	3145919	35
TU-1687	FWD	3147688	3148563	875 MU-1096	3147658 yghA	yghA	3147684	26

TU-1688	FWD	3150188	3151463	1275 MU-1097	3150232 metC	metC	3150258	26
TU-1689	FWD	3151488	3152213	725 MU-1098	3151551 yghB	yghB	3151585	34
TU-1690	FWD	3153322	3155522	2200 MU-1099;MU-1100	3153325 yqhD;dkgA	yqhD	3153377	52
TU-1691	FWD	3153322	3155522	2200 MU-1099;MU-1100	3153352 yqhD;dkgA	yqhD	3153377	25
TU-1692	FWD	3154647	3155522	875 MU-1100	3154594 dkgA	dkgA	3154645	51
TU-1693	FWD	3155672	3156906	1234 MU-1101	yqhG;yqhH	yqhG	3155672	
TU-1694	FWD	3167824	3169824	2000 MU-1102	3167822 qseB;qseC	qseB	3167850	28
TU-1695	FWD	3170552	3171152	600 MU-1103	3170526 mdaB	mdaB	3170552	26
TU-1696	FWD	3171177	3171527	350 MU-1104	3171143 ygiN	ygiN	3171164	21
TU-1697	FWD	3175102	3175277	175 MU-1105	3175035 NT			
TU-1698	FWD	3175902	3177702	1800 MU-1106	3175888 tolC	tolC	3176137	249
TU-1699	FWD	3175902	3177702	1800 MU-1106	3176023 tolC	tolC	3176137	114
TU-1700	FWD	3175902	3177702	1800 MU-1106	3176097 tolC	tolC	3176137	40
TU-1701	FWD	3177752	3179652	1900 MU-1107;MU-1108	3177739 ygiB;ygiC	ygiB	3177766	27
TU-1702	FWD	3178877	3179652	775 MU-1108	3178779 ygiC	ygiC	3178443	-336
TU-1703	FWD	3178877	3179652	775 MU-1108	3178893 ygiC	ygiC	3178443	-450
TU-1704	FWD	3178877	3179652	775 MU-1108	3178902 ygiC	ygiC	3178443	-459
TU-1705	FWD	3180477	3181327	850 MU-1109	3180445 zupT	zupT	3180572	127
TU-1706	FWD	3180477	3181327	850 MU-1109	3180472 zupT	zupT	3180572	100
TU-1707	FWD	3182852	3183127	275 MU-1110	3182820 yqiC	yqiC	3182862	42
TU-1708	FWD	3182852	3183127	275 MU-1110	3182835 yqiC	yqiC	3182862	27
TU-1709	FWD	3183436	3183987	551 MU-1111	ygiL	ygiL	3183436	
TU-1710	FWD	3184083	3184111	28 MU-1112	yqiG	yqiG	3184083	
TU-1711	FWD	3184127	3185552	1425 MU-1113	3184102 insC;insD	insC	3184209	107
TU-1712	FWD	3184083	3189718	5635 MU-1114	yqiG;yqiH;yqiI	yqiG	3185443	
TU-1713	FWD	3190230	3192547	2317 MU-1115	yqiJ;yqiK	yqiJ	3190230	
TU-1714	FWD	3199102	3201402	2300 MU-1116;MU-1117	3199068 htrG;cca	htrG	3199229	161
TU-1715	FWD	3199102	3201402	2300 MU-1116;MU-1117	3199114 htrG;cca	htrG	3199229	115
TU-1716	FWD	3199102	3201402	2300 MU-1116;MU-1117	3199202 htrG;cca	htrG	3199229	27
TU-1717	FWD	3199852	3201402	1550 MU-1117	3199811 cca	cca	3199913	102
TU-1718	FWD	3199852	3201402	1550 MU-1117	3199885 cca	cca	3199913	28
TU-1719	FWD	3199852	3201402	1550 MU-1117	3199888 cca	cca	3199913	25
TU-1720	FWD	3199852	3201402	1550 MU-1117	3199920 cca	cca	3199913	-7
TU-1721	FWD	3202627	3203352	725 MU-1118	3202677 ygiH	ygiH	3202716	39
TU-1722	FWD	3204485	3207509	3024 MU-1119	ttdA;ttdB;ttdT	ttdA	3204485	
TU-1723	FWD	3208702	3210627	1925 MU-1120	3208669 rpsU;dnaG	rpsU	3208803	134
TU-1724	FWD	3208702	3210627	1925 MU-1120	3208738 rpsU;dnaG	rpsU	3208803	65
TU-1725	FWD	3208702	3210627	1925 MU-1120	3208740 rpsU;dnaG	rpsU	3208803	63
TU-1726	FWD	3208702	3210627	1925 MU-1120	3208743 rpsU;dnaG	rpsU	3208803	60
TU-1727	FWD	3208702	3210627	1925 MU-1120	3208781 rpsU;dnaG	rpsU	3208803	22
TU-1728	FWD	3210652	3212952	2300 MU-1121	3210489 rpoD	rpoD	3211069	580
TU-1729	FWD	3210652	3212952	2300 MU-1121	3210710 rpoD	rpoD	3211069	359
TU-1730	FWD	3210652	3212952	2300 MU-1121	3210752 rpoD	rpoD	3211069	317
TU-1731	FWD	3210652	3212952	2300 MU-1121	3210963 rpoD	rpoD	3211069	106
TU-1732	FWD	3213652	3213677	25 MU-1122	3213668 ileX	ileX	3213620	-48
TU-1733	FWD	3214752	3215552	800 MU-1123	3214775 yqiI	yqiI	3214801	26

TU-1734	FWD	3217502	3219052	1550 MU-1124	3217481 ygjG	ygjG	3217516	35
TU-1735	FWD	3219428	3220353	925 MU-1125	3219417 ebgR	ebgR	3219488	71
TU-1736	FWD	3220655	3224193	3538 MU-1126	ebgA;ebgC	ebgA	3220655	
TU-1737	FWD	3224256	3225689	1433 MU-1127	ygjI	ygjI	3224256	
TU-1738	FWD	3225823	3229261	3438 MU-1128	ygjJ;ygjK	ygjJ	3225823	
TU-1739	FWD	3229703	3231653	1950 MU-1129	3229646 fadH	fadH	3229687	41
TU-1740	FWD	3233953	3234428	475 MU-1130	3233959 ygjP;ygjQ	ygjP	3233982	23
TU-1741	FWD	3235328	3236328	1000 MU-1131	3235304 ygjR	ygjR	3235333	29
TU-1742	FWD	3236378	3236553	175 MU-1132	3236497 psrN	psrN	3236396	-101
TU-1743	FWD	3236602	3237567	965 MU-1133	alx	alx	3236602	
TU-1744	FWD	3237903	3239128	1225 MU-1134	3237885 sstT	sstT	3237966	81
TU-1745	FWD	3243198	3244523	1325 MU-1135	3243045 exuT	exuT	3243126	81
TU-1746	FWD	3244648	3245423	775 MU-1136	3244646 exuR	exuR	3244674	28
TU-1747	FWD	3244648	3245423	775 MU-1136	3244656 exuR	exuR	3244674	18
TU-1748	FWD	3245523	3246823	1300 MU-1137	3245573 yqjA;yqjB	yqjA	3245795	222
TU-1749	FWD	3245523	3246823	1300 MU-1137	3245627 yqjA;yqjB	yqjA	3245795	168
TU-1750	FWD	3245523	3246823	1300 MU-1137	3245652 yqjA;yqjB	yqjA	3245795	143
TU-1751	FWD	3245523	3246823	1300 MU-1137	3245667 yqjA;yqjB	yqjA	3245795	128
TU-1752	FWD	3246873	3248398	1525 MU-1138	3246991 yqjC;yqjD;yqjE;yqjK	yqjC	3246991	0
TU-1753	FWD	3248448	3248923	475 MU-1139	3248592 yqjF	yqjF	3248584	-8
TU-1754	FWD	3249048	3250073	1025 MU-1140	3249186 yqjG	yqjG	3249046	-140
TU-1755	FWD	3250223	3250723	500 MU-1141	3250285 yhaH	yhaH	3250326	41
TU-1756	FWD	3250933	3251289	356 MU-1142	yhaI	yhaI	3250933	
TU-1757	FWD	3252349	3252524	175 MU-1143	3252319 yhaK	yhaK	3252341	22
TU-1758	FWD	3253049	3253324	275 MU-1144	3253037 yhaL	yhaL	3253065	28
TU-1759	FWD	3253049	3253324	275 MU-1144	3253039 yhaL	yhaL	3253065	26
TU-1760	FWD	3265402	3265620	218 MU-1145	tdcR	tdcR	3265402	
TU-1761	FWD	3265876	3267624	1748 MU-1146	yhaB;yhaC	yhaB	3265876	
TU-1762	FWD	3267751	3268195	444 MU-1147	3267552 NT			
TU-1763	FWD	3273295	3274845	1550 MU-1148	3273229 garD	garD	3273304	75
TU-1764	FWD	3273295	3274845	1550 MU-1148	3273257 garD	garD	3273304	47
TU-1765	FWD	3273295	3274845	1550 MU-1148	3273271 garD	garD	3273304	33
TU-1766	FWD	3274995	3275820	825 MU-1149	3274994 sohA;yhaV	sohA	3275024	30
TU-1767	FWD	3276936	3282025	5089 MU-1150	3276888 kbaZ;agaV;agaW;agaA;agaS;kbaY	kbaZ	3276936	48
TU-1768	FWD	3282192	3285047	2855 MU-1151	3281839 agaB;agaC;agaD;agaI	agaB	3282192	353
TU-1769	FWD	3285448	3290454	5006 MU-1152	3285425 yraH;yraI;yraJ;yraK	yraH	3285448	23
TU-1770	FWD	3291421	3295171	3750 MU-1153;MU-1154;MU-1155	3291391 yraM;yraN;diaA;yraP	yraM	3291422	31
TU-1771	FWD	3293846	3295171	1325 MU-1154;MU-1155	3293818 diaA;yraP	diaA	3293831	13
TU-1772	FWD	3294596	3295171	575 MU-1155	3294399 yraP	yraP	3294431	32
TU-1773	FWD	3296971	3297521	550 MU-1156	3296930 yhbO	yhbO	3296996	66
TU-1774	FWD	3297996	3298221	225 MU-1157	3297963 yhbQ	yhbQ	3297988	25
TU-1775	FWD	3299271	3301096	1825 MU-1158	3299461 yhbU;yhbV	yhbU	3299507	46
TU-1776	FWD	3301471	3302796	1325 MU-1159	3301434 yhbW	yhbW	3301470	36
TU-1777	FWD	3301471	3302796	1325 MU-1159	3301444 yhbW	yhbW	3301470	26
TU-1778	FWD	3309247	3309420	173 MU-1160	psrO	psrO	3309247	
TU-1779	FWD	3316521	3317946	1425 MU-1161	3316582 argG	argG	3316659	77

TU-1780	FWD	3316521	3317946	1425 MU-1161	3316589 argG	argG	3316659	70
TU-1781	FWD	3316521	3317946	1425 MU-1161	3316601 argG	argG	3316659	58
TU-1782	FWD	3316521	3317946	1425 MU-1161	3316636 argG	argG	3316659	23
TU-1783	FWD	3325796	3326171	375 MU-1162	3325781 yhbY	yhbY	3325812	31
TU-1784	FWD	3326971	3328521	1550 MU-1163	3326958 dacB	dacB	3326985	27
TU-1785	FWD	3331546	3333096	1550 MU-1164	3331658 ispB;sfsB	ispB	3331732	74
TU-1786	FWD	3331546	3333096	1550 MU-1164	3331724 ispB;sfsB	ispB	3331732	8
TU-1787	FWD	3331546	3333096	1550 MU-1164	3331736 ispB;sfsB	ispB	3331732	-4
TU-1788	FWD	3338272	3340272	2000 MU-1165	3338233 yrbG;kdsD	yrbG	3338297	64
TU-1789	FWD	3338272	3340272	2000 MU-1165	3338256 yrbG;kdsD	yrbG	3338297	41
TU-1790	FWD	3340297	3341272	975 MU-1166	3340285 kdsC;yrbK	kdsC	3340295	10
TU-1791	FWD	3341297	3342697	1400 MU-1167	3341327 lptA;lptB	lptA	3341402	75
TU-1792	FWD	3341297	3342697	1400 MU-1167	3341390 lptA;lptB	lptA	3341402	12
TU-1793	FWD	3342722	3346297	3575 MU-1168;MU-1169	3342713 rpoN;hpf;ptsN;yhbJ;npr	rpoN	3342739	26
TU-1794	FWD	3344247	3346297	2050 MU-1169	3344129 hpf;ptsN;yhbJ;npr	hpf	3344195	66
TU-1795	FWD	3344247	3346297	2050 MU-1169	3344137 hpf;ptsN;yhbJ;npr	hpf	3344195	58
TU-1796	FWD	3346472	3347397	925 MU-1170	3346447 yrbL	yrbL	3346474	27
TU-1797	FWD	3348604	3348704	100 MU-1171	3348610 ryhA	ryhA	3348599	-11
TU-1798	FWD	3350054	3350104	50 MU-1172	NT			
TU-1799	FWD	3352104	3352329	225 MU-1173	3352068 NT			
TU-1800	FWD	3352554	3358729	6175 MU-1174	3352533 gltB;gltD	gltB	3352654	121
TU-1801	FWD	3352554	3358729	6175 MU-1174	3352544 gltB;gltD	gltB	3352654	110
TU-1802	FWD	3352554	3358729	6175 MU-1174	3352583 gltB;gltD	gltB	3352654	71
TU-1803	FWD	3359204	3360079	875 MU-1175	3359153 gltF	gltF	3359198	45
TU-1804	FWD	3359204	3360079	875 MU-1175	3359163 gltF	gltF	3359198	35
TU-1805	FWD	3359204	3360079	875 MU-1175	3359175 gltF	gltF	3359198	23
TU-1806	FWD	3360134	3363573	3439 MU-1176	yhcA;yhcD;yhcE	yhcA	3360134	
TU-1807	FWD	3361129	3363029	1900 MU-1177	3360933 yhcD;yhcE	yhcD	3360829	-104
TU-1808	FWD	3361129	3363029	1900 MU-1177	3360973 yhcD;yhcE	yhcD	3360829	-144
TU-1809	FWD	3363207	3363573	366 MU-1178	yhcE	yhcE	3363207	
TU-1810	FWD	3365004	3365879	875 MU-1179	3364969 yhcF	yhcF	3364948	-21
TU-1811	FWD	3365004	3365879	875 MU-1179	3364973 yhcF	yhcF	3364948	-25
TU-1812	FWD	3365849	3366976	1127 MU-1180	yhcG	yhcG	3365849	
TU-1813	FWD	3372891	3374258	1367 MU-1181	dcuD	dcuD	3372891	
TU-1814	FWD	3378059	3378584	525 MU-1182	3378148 yhcB	yhcB	3378213	65
TU-1815	FWD	3378059	3378584	525 MU-1182	3378182 yhcB	yhcB	3378213	31
TU-1816	FWD	3378709	3380084	1375 MU-1183	3378675 degQ	degQ	3378765	90
TU-1817	FWD	3378709	3380084	1375 MU-1183	3378729 degQ	degQ	3378765	36
TU-1818	FWD	3380184	3381284	1100 MU-1184	3380203 degS	degS	3380222	19
TU-1819	FWD	3382684	3383184	500 MU-1185	3382622 argR	argR	3382725	103
TU-1820	FWD	3382684	3383184	500 MU-1185	3382699 argR	argR	3382725	26
TU-1821	FWD	3383528	3383803	275 MU-1186	3383540 yhcN	yhcN	3383560	20
TU-1822	FWD	3386978	3387503	525 MU-1187	3386963 NT			
TU-1823	FWD	3387553	3388428	875 MU-1188	3387502 aaeR	aaeR	3387542	40
TU-1824	FWD	3391028	3391128	100 MU-1189	3390911 NT			
TU-1825	FWD	3392528	3392628	100 MU-1190	3392539 NT			



TU-1826	FWD	3395878	3395928	50 MU-1191	3395856 NT			
TU-1827	FWD	3400628	3401353	725 MU-1192	3400640 NT			
TU-1828	FWD	3401378	3402578	1200 MU-1193	3401252 yhdH	yhdH	3401506	254
TU-1829	FWD	3401378	3402578	1200 MU-1193	3401401 yhdH	yhdH	3401506	105
TU-1830	FWD	3401378	3402578	1200 MU-1193	3401475 yhdH	yhdH	3401506	31
TU-1831	FWD	3402628	3403078	450 MU-1194	3402769 yrdE	yrdE	3402666	-103
TU-1832	FWD	3402628	3403078	450 MU-1194	3402779 yrdE	yrdE	3402666	-113
TU-1833	FWD	3403328	3405278	1950 MU-1195	3403396 accB;accC	accB	3403458	62
TU-1834	FWD	3403328	3405278	1950 MU-1195	3403474 accB;accC	accB	3403458	-16
TU-1835	FWD	3405406	3408006	2600 MU-1196;MU-1197	3405208 yhdT;panF;prmA	yhdT	3405397	189
TU-1836	FWD	3405406	3408006	2600 MU-1196;MU-1197	3405256 yhdT;panF;prmA	yhdT	3405397	141
TU-1837	FWD	3406831	3408006	1175 MU-1197	3407005 prmA	prmA	3407092	87
TU-1838	FWD	3406831	3408006	1175 MU-1197	3407062 prmA	prmA	3407092	30
TU-1839	FWD	3408206	3409606	1400 MU-1198	3408270 dusB;fis	dusB	3408302	32
TU-1840	FWD	3409675	3410756	1081 MU-1199;MU-1200	yhdJ;yhdU	yhdJ	3409675	
TU-1841	FWD	3410656	3410756	100 MU-1200	3410612 yhdU	yhdU	3410643	31
TU-1842	FWD	3411886	3416159	4273 MU-1201	3411816 acrE;acrF	acrE	3411886	70
TU-1843	FWD	3416357	3416557	200 MU-1202	3416353 yhdV	yhdV	3416412	59
TU-1844	FWD	3416982	3421182	4200 MU-1203	3417074 yhdW;yhdX;yhdY;yhdZ	yhdW	3417064	-10
TU-1845	FWD	3427232	3428007	775 MU-1204	3427233 yrdA	yrdA	3427258	25
TU-1846	FWD	3431707	3435882	4175 MU-1205	3431672 def;fmt;rsmB;trkA	def	3431712	40
TU-1847	FWD	3431707	3435882	4175 MU-1205	3431680 def;fmt;rsmB;trkA	def	3431712	32
TU-1848	FWD	3436032	3436457	425 MU-1206	3435866 mscL	mscL	3436046	180
TU-1849	FWD	3436032	3436457	425 MU-1206	3436063 mscL	mscL	3436046	-17
TU-1850	FWD	3453572	3463997	10425 MU-1207	3453562 gspC;gspD;gspE;gspF;gspG;gspH;gspI;gspJ;gspK;gspL;gspM;gspO	gspC	3453600	38
TU-1851	FWD	3453572	3463997	10425 MU-1207	3453580 gspC;gspD;gspE;gspF;gspG;gspH;gspI;gspJ;gspK;gspL;gspM;gspO	gspC	3453600	20
TU-1852	FWD	3475524	3475874	350 MU-1208	3475637 slyX	slyX	3475662	25
TU-1853	FWD	3476499	3476699	200 MU-1209	3476465 NT			
TU-1854	FWD	3479149	3483324	4175 MU-1210;MU-1211	3479280 yheS;yheT;yheU;prkB	yheS	3479311	31
TU-1855	FWD	3482024	3483324	1300 MU-1211	3482202 yheU;prkB	yheU	3482240	38
TU-1856	FWD	3483999	3486924	2925 MU-1212	3483975 crp;yhfK	crp	3484142	167
TU-1857	FWD	3483999	3486924	2925 MU-1212	3483987 crp;yhfK	crp	3484142	155
TU-1858	FWD	3483999	3486924	2925 MU-1212	3483071 crp;yhfK	crp	3484142	1071
TU-1859	FWD	3483999	3486924	2925 MU-1212	3484074 crp;yhfK	crp	3484142	68
TU-1860	FWD	3483999	3486924	2925 MU-1212	3484120 crp;yhfK	crp	3484142	22
TU-1861	FWD	3483999	3486924	2925 MU-1212	3484132 crp;yhfK	crp	3484142	10
TU-1862	FWD	3490574	3491749	1175 MU-1213	3490542 tsgA	tsgA	3490590	48
TU-1863	FWD	3491899	3495635	3736 MU-1214	3491922 nirB;nirD;nirC	nirB	3492033	111
TU-1864	FWD	3491899	3495635	3736 MU-1214	3492009 nirB;nirD;nirC	nirB	3492033	24
TU-1865	FWD	3495735	3497185	1450 MU-1215	3495774 cysG	cysG	3495850	76
TU-1866	FWD	3495735	3497185	1450 MU-1215	3495828 cysG	cysG	3495850	22
TU-1867	FWD	3497535	3497610	75 MU-1216	3497436 yhfL	yhfL	3497470	34
TU-1868	FWD	3497535	3497610	75 MU-1216	3497478 yhfL	yhfL	3497470	-8
TU-1869	FWD	3497932	3501974	4042 MU-1217	frlA;frlB;frlC;frlD	frlA	3497932	

TU-1870	FWD	3501985	3502860	875 MU-1218	3502047 frlR	frlR	3502074	27
TU-1871	FWD	3501985	3502860	875 MU-1218	3502055 frlR	frlR	3502074	19
TU-1872	FWD	3501985	3502860	875 MU-1218	3502099 frlR	frlR	3502074	-25
TU-1873	FWD	3506512	3506687	175 MU-1219	NT			
TU-1874	FWD	3520887	3523412	2525 MU-1220	3520848 mrcA	mrcA	3520893	45
TU-1875	FWD	3524312	3526612	2300 MU-1221	3524344 yrfF	yrfF	3524491	147
TU-1876	FWD	3526687	3528787	2100 MU-1222;MU-1223	3526662 yrfG;hslR;hslO	yrfG	3526691	29
TU-1877	FWD	3527162	3528787	1625 MU-1223	3527132 hslR;hslO	hslR	3527370	238
TU-1878	FWD	3530737	3532463	1726 MU-1224	3530701 pck	pck	3530840	139
TU-1879	FWD	3530737	3532463	1726 MU-1224	3530813 pck	pck	3530840	27
TU-1880	FWD	3534488	3535313	825 MU-1225	3534487 greB	greB	3534834	347
TU-1881	FWD	3534488	3535313	825 MU-1225	3534659 greB	greB	3534834	175
TU-1882	FWD	3534488	3535313	825 MU-1225	3534688 greB	greB	3534834	146
TU-1883	FWD	3535363	3537813	2450 MU-1226	3535375 yhgF	yhgF	3535407	32
TU-1884	FWD	3535363	3537813	2450 MU-1226	3535376 yhgF	yhgF	3535407	31
TU-1885	FWD	3538038	3540988	2950 MU-1227	3538080 feoA;feoB;feoC	feoA	3538185	105
TU-1886	FWD	3541863	3542263	400 MU-1228	yhgA	yhgA	3541189	
TU-1887	FWD	3542904	3543587	683 MU-1229	3542880 gntX	gntX	3542904	24
TU-1888	FWD	3543213	3544313	1100 MU-1230	3543480 gntY	gntY	3543646	166
TU-1889	FWD	3543213	3544313	1100 MU-1230	3543618 gntY	gntY	3543646	28
TU-1890	FWD	3543213	3544313	1100 MU-1230	3543630 gntY	gntY	3543646	16
TU-1891	FWD	3543213	3544313	1100 MU-1230	3543655 gntY	gntY	3543646	-9
TU-1892	FWD	3544488	3545888	1400 MU-1231	3544427 gntT	gntT	3544581	154
TU-1893	FWD	3544488	3545888	1400 MU-1231	3544499 gntT	gntT	3544581	82
TU-1894	FWD	3550788	3553938	3150 MU-1232	3551046 malT	malT	3551107	61
TU-1895	FWD	3556314	3556564	250 MU-1233	rtcR	rtcR	3556290	
TU-1896	FWD	3559964	3561939	1975 MU-1234	3559931 glpD	glpD	3560036	105
TU-1897	FWD	3559964	3561939	1975 MU-1234	3559948 glpD	glpD	3560036	88
TU-1898	FWD	3559964	3561939	1975 MU-1234	3560002 glpD	glpD	3560036	34
TU-1899	FWD	3559964	3561939	1975 MU-1234	3560011 glpD	glpD	3560036	25
TU-1900	FWD	3572822	3573897	1075 MU-1235	3572952 yhgN	yhgN	3573094	142
TU-1901	FWD	3579172	3579697	525 MU-1236	3579134 yhhY	yhhY	3579161	27
TU-1902	FWD	3579886	3581441	1555 MU-1237	yhhZ;yrhA	yhhZ	3579886	
TU-1903	FWD	3581470	3582195	725 MU-1238	3581412 insA;insB	insA	3581506	94
TU-1904	FWD	3581061	3581441	380 MU-1239	yrhA	yrhA	3582219	
TU-1905	FWD	3582427	3582582	155 MU-1240	yrhD	yrhD	3582427	
TU-1906	FWD	3582670	3583070	400 MU-1241	3582633 yrhB	yrhB	3582782	149
TU-1907	FWD	3584970	3585595	625 MU-1242	3584943 yhhA	yhhA	3584966	23
TU-1908	FWD	3590495	3590595	100 MU-1243	3590459 NT			
TU-1909	FWD	3590495	3590595	100 MU-1243	3590461 NT			
TU-1910	FWD	3595974	3596474	500 MU-1244	3595981 yhhK	yhhK	3596007	26
TU-1911	FWD	3602374	3603249	875 MU-1245	3602350 rsmD;yhhL	rsmD	3602416	66
TU-1912	FWD	3602374	3603249	875 MU-1245	3602360 rsmD;yhhL	rsmD	3602416	56
TU-1913	FWD	3603749	3606599	2850 MU-1246;MU-1247	3603759 yhhN;zntA	yhhN	3603774	15
TU-1914	FWD	3604474	3606599	2125 MU-1247	3604445 zntA	zntA	3604474	29
TU-1915	FWD	3607174	3607774	600 MU-1248	3607131 yhhQ	yhhQ	3607240	109

TU-1916	FWD	3607174	3607774	600 MU-1248	3607248 yhhQ	yhhQ	3607240	-8
TU-1917	FWD	3607874	3608499	625 MU-1249	3607940 dcrB	dcrB	3607978	38
TU-1918	FWD	3609899	3610724	825 MU-1250	3609865 yhhT	yhhT	3609888	23
TU-1919	FWD	3610799	3611724	925 MU-1251	3610784 acpT	acpT	3610992	208
TU-1920	FWD	3610799	3611724	925 MU-1251	3610789 acpT	acpT	3610992	203
TU-1921	FWD	3610799	3611724	925 MU-1251	3610844 acpT	acpT	3610992	148
TU-1922	FWD	3611690	3616605	4915 MU-1252	nikA;nikB;nikC;nikD;nikE	nikA	3611690	
TU-1923	FWD	3616574	3616824	250 MU-1253	3616560 nikR	nikR	3616611	51
TU-1924	FWD	3616574	3616824	250 MU-1253	3616569 nikR	nikR	3616611	42
TU-1925	FWD	3617224	3621674	4450 MU-1254	3617209 rhsB;yhhH	rhsB	3617215	6
TU-1926	FWD	3621924	3623474	1550 MU-1255	3621754 yrhC;yhhI	yrhC	3621910	156
TU-1927	FWD	3632874	3633549	675 MU-1256	3632765 yhiM	yhiM	3632822	57
TU-1928	FWD	3635549	3637324	1775 MU-1257	3635635 pitA	pitA	3635665	30
TU-1929	FWD	3635549	3637324	1775 MU-1257	3635677 pitA	pitA	3635665	-12
TU-1930	FWD	3637974	3638574	600 MU-1258	3638007 uspA	uspA	3638134	127
TU-1931	FWD	3637974	3638574	600 MU-1258	3638021 uspA	uspA	3638134	113
TU-1932	FWD	3637974	3638574	600 MU-1258	3638114 uspA	uspA	3638134	20
TU-1933	FWD	3638899	3640324	1425 MU-1259	3639000 yhiP	yhiP	3638885	-115
TU-1934	FWD	3643324	3645774	2450 MU-1260;MU-1261	3643355 yhiR;gor	yhiR	3643408	53
TU-1935	FWD	3644224	3645774	1550 MU-1261	3644298 gor	gor	3644322	24
TU-1936	FWD	3646124	3646249	125 MU-1262	3646086 NT			
TU-1937	FWD	3646560	3648035	1475 MU-1263	3646533 arsR;arsB	arsR	3646551	18
TU-1938	FWD	3648135	3648810	675 MU-1264	3648138 arsC	arsC	3648260	122
TU-1939	FWD	3648135	3648810	675 MU-1264	3648198 arsC	arsC	3648260	62
TU-1940	FWD	3649314	3650054	740 MU-1265	yhiS	yhiS	3649314	
TU-1941	FWD	3651985	3652710	725 MU-1266	3651959 slp	slp	3651984	25
TU-1942	FWD	3652706	3653236	530 MU-1267	dctR	dctR	3652706	
TU-1943	FWD	3655010	3655585	575 MU-1268	3654983 hdeD	hdeD	3655018	35
TU-1944	FWD	3655010	3655585	575 MU-1268	3654989 hdeD	hdeD	3655018	29
TU-1945	FWD	3655010	3655585	575 MU-1268	3655002 hdeD	hdeD	3655018	16
TU-1946	FWD	3655010	3655585	575 MU-1268	3655034 hdeD	hdeD	3655018	-16
TU-1947	FWD	3655835	3661460	5625 MU-1269;MU-1270	3655823 gadE;mdtE;mdtF	gadE	3656389	566
TU-1948	FWD	3655835	3661460	5625 MU-1269;MU-1270	3656265 gadE;mdtE;mdtF	gadE	3656389	124
TU-1949	FWD	3655835	3661460	5625 MU-1269;MU-1270	3656297 gadE;mdtE;mdtF	gadE	3656389	92
TU-1950	FWD	3655835	3661460	5625 MU-1269;MU-1270	3656322 gadE;mdtE;mdtF	gadE	3656389	67
TU-1951	FWD	3655835	3661460	5625 MU-1269;MU-1270	3656369 gadE;mdtE;mdtF	gadE	3656389	20
TU-1952	FWD	3657185	3661460	4275 MU-1270	3656973 gadE;mdtE;mdtF	gadE	3656389	-584
TU-1953	FWD	3657185	3661460	4275 MU-1270	3657015 mdtE;mdtF	mdtE	3657255	240
TU-1954	FWD	3657185	3661460	4275 MU-1270	3657239 mdtE;mdtF	mdtE	3657255	16
TU-1955	FWD	3662835	3662935	100 MU-1271	3662887 gadY	gadY	3662887	0
TU-1956	FWD	3664260	3664385	125 MU-1272	3664096 NT			
TU-1957	FWD	3667585	3668885	1300 MU-1273	3667508 treF	treF	3667615	107
TU-1958	FWD	3667585	3668885	1300 MU-1273	3667569 treF	treF	3667615	46
TU-1959	FWD	3667585	3668885	1300 MU-1273	3667572 treF	treF	3667615	43
TU-1960	FWD	3668910	3669435	525 MU-1274	3668915 NT			
TU-1961	FWD	3670415	3671440	1025 MU-1275	3670379 yhjC	yhjC	3670437	58

TU-1962	FWD	3671465	3672390	925 MU-1276	3671355 yhjD	yhjD	3671385	30
TU-1963	FWD	3672815	3674340	1525 MU-1277	3672780 yhjE	yhjE	3672809	29
TU-1964	FWD	3672815	3674340	1525 MU-1277	3672782 yhjE	yhjE	3672809	27
TU-1965	FWD	3677365	3678315	950 MU-1278	3677415 kdjK	kdjK	3677442	27
TU-1966	FWD	3694466	3697866	3400 MU-1279	3694420 bcsE;bcsF;bcsG	bcsE	3694481	61
TU-1967	FWD	3694466	3697866	3400 MU-1279	3694466 bcsE;bcsF;bcsG	bcsE	3694481	15
TU-1968	FWD	3698241	3698266	25 MU-1280	3698161 rdID	rdID	3698159	-2
TU-1969	FWD	3698491	3699141	650 MU-1281	3698565 yhjV	yhjV	3698586	21
TU-1970	FWD	3699691	3699816	125 MU-1282	3699582 NT			
TU-1971	FWD	3705969	3706294	325 MU-1283	3705912 NT			
TU-1972	FWD	3710794	3712169	1375 MU-1284	3710942 tag;yiaC	tag	3711115	173
TU-1973	FWD	3714569	3715194	625 MU-1285	3714525 yiaD	yiaD	3714570	45
TU-1974	FWD	3715319	3716269	950 MU-1286	3715310 ghrB	ghrB	3715333	23
TU-1975	FWD	3717469	3717794	325 MU-1287	3717454 yiaG	yiaG	3717501	47
TU-1976	FWD	3717469	3717794	325 MU-1287	3717461 yiaG	yiaG	3717501	40
TU-1977	FWD	3717469	3717794	325 MU-1287	3717466 yiaG	yiaG	3717501	35
TU-1978	FWD	3717919	3718244	325 MU-1288	3717912 cspA	cspA	3718072	160
TU-1979	FWD	3717919	3718244	325 MU-1288	3718038 cspA	cspA	3718072	34
TU-1980	FWD	3718703	3720072	1369 MU-1289	3718397 insJ;insK	insJ	3718703	306
TU-1981	FWD	3720094	3720169	75 MU-1290	sokA	sokA	3720099	
TU-1982	FWD	3724369	3724869	500 MU-1291	3723922 wecH	wecH	3723910	-12
TU-1983	FWD	3729154	3734246	5092 MU-1292;MU-1293	3729092 xylF;xylG;xylH;xylR	xylF	3729154	62
TU-1984	FWD	3732896	3734246	1350 MU-1293	3732937 xylR	xylR	3733002	65
TU-1985	FWD	3735101	3737326	2225 MU-1294	3735030 malS	malS	3735520	490
TU-1986	FWD	3735101	3737326	2225 MU-1294	3735218 malS	malS	3735520	302
TU-1987	FWD	3737726	3739276	1550 MU-1295	3737697 avtA	avtA	3737728	31
TU-1988	FWD	3740756	3748804	8048 MU-1296	3740696 yiaK;yiaL;yiaM;yiaN;yiaO;lyx;sgbH;sgbU;sgbE	yiaK	3740756	60
TU-1989	FWD	3748941	3749132	191 MU-1297	ysaD	ysaD	3748941	
TU-1990	FWD	3749926	3750676	750 MU-1298	3749991 yiaU	yiaU	3750015	24
TU-1991	FWD	3760152	3763827	3675 MU-1299	3760215 rhsA	rhsA	3760206	-9
TU-1992	FWD	3764127	3764977	850 MU-1300	3764190 yibA	yibA	3764360	170
TU-1993	FWD	3764127	3764977	850 MU-1300	3764321 yibA	yibA	3764360	39
TU-1994	FWD	3764127	3764977	850 MU-1300	3764326 yibA	yibA	3764360	34
TU-1995	FWD	3765052	3766027	975 MU-1301	3764936 yibJ	yibJ	3765244	308
TU-1996	FWD	3766252	3767202	950 MU-1302	yibG;yibS;yibW	yibG	3766200	
TU-1997	FWD	3767368	3767703	335 MU-1303	3767397 yibV	yibV	3767368	-29
TU-1998	FWD	3767971	3768169	198 MU-1304	yibU	yibU	3767971	
TU-1999	FWD	3770177	3772327	2150 MU-1305	3770149 mtIA	mtIA	3770304	155
TU-2000	FWD	3770177	3772327	2150 MU-1305	3770212 mtIA	mtIA	3770304	92
TU-2001	FWD	3772427	3774002	1575 MU-1306	3772407 mtID;mtIR	mtID	3772447	40
TU-2002	FWD	3772427	3774002	1575 MU-1306	3772421 mtID;mtIR	mtID	3772447	26
TU-2003	FWD	3772427	3774002	1575 MU-1306	3772428 mtID;mtIR	mtID	3772447	19
TU-2004	FWD	3772427	3774002	1575 MU-1306	3772439 mtID;mtIR	mtID	3772447	8
TU-2005	FWD	3774677	3775127	450 MU-1307	3774659 yibL	yibL	3774688	29
TU-2006	FWD	3775377	3779127	3750 MU-1308	3775315 lldP;lldR;lldD	lldP	3775422	107

TU-2007	FWD	3779252	3779702	450 MU-1309	3779202 yibK	yibK	3779238	36
TU-2008	FWD	3783102	3787177	4075 MU-1310;MU-1311;MU-1312	3783229 gpmM;envC;yibQ	gpmM	3783283	54
TU-2009	FWD	3783102	3787177	4075 MU-1310;MU-1311;MU-1312	3783250 gpmM;envC;yibQ	gpmM	3783283	33
TU-2010	FWD	3783102	3787177	4075 MU-1310;MU-1311;MU-1312	3783255 gpmM;envC;yibQ	gpmM	3783283	28
TU-2011	FWD	3783102	3787177	4075 MU-1310;MU-1311;MU-1312	3783260 gpmM;envC;yibQ	gpmM	3783283	23
TU-2012	FWD	3784952	3787177	2225 MU-1311;MU-1312	3784837 envC;yibQ	envC	3784861	24
TU-2013	FWD	3784952	3787177	2225 MU-1311;MU-1312	3784987 envC;yibQ	envC	3784861	-126
TU-2014	FWD	3784952	3787177	2225 MU-1311;MU-1312	3785034 envC;yibQ	envC	3784861	-173
TU-2015	FWD	3785902	3787177	1275 MU-1312	3786063 yibQ	yibQ	3786124	61
TU-2016	FWD	3791802	3796177	4375 MU-1313;MU-1314	3791776 rfaD;rfaF;rfaC;rfaL	rfaD	3792010	234
TU-2017	FWD	3791802	3796177	4375 MU-1313;MU-1314	3791833 rfaD;rfaF;rfaC;rfaL	rfaD	3792010	177
TU-2018	FWD	3791802	3796177	4375 MU-1313;MU-1314	3791962 rfaD;rfaF;rfaC;rfaL	rfaD	3792010	48
TU-2019	FWD	3791802	3796177	4375 MU-1313;MU-1314	3791993 rfaD;rfaF;rfaC;rfaL	rfaD	3792010	17
TU-2020	FWD	3795077	3796177	1100 MU-1314	3794947 rfaL	rfaL	3794971	24
TU-2021	FWD	3795077	3796177	1100 MU-1314	3795078 rfaL	rfaL	3794971	-107
TU-2022	FWD	3806556	3808431	1875 MU-1315;MU-1316	3806539 waaA;coaD	waaA	3806563	24
TU-2023	FWD	3807456	3808431	975 MU-1316	3807344 coaD	coaD	3807848	504
TU-2024	FWD	3810656	3813081	2425 MU-1317;MU-1318	3810724 dfp;dut;slmA	dfp	3810754	30
TU-2025	FWD	3811706	3813081	1375 MU-1318	3811780 dut;slmA	dut	3811955	175
TU-2026	FWD	3811706	3813081	1375 MU-1318	3811866 dut;slmA	dut	3811955	89
TU-2027	FWD	3814706	3815581	875 MU-1319	3814671 yicC	yicC	3814699	28
TU-2028	FWD	3814706	3815581	875 MU-1319	3814680 yicC	yicC	3814699	19
TU-2029	FWD	3815783	3816607	824 MU-1320	3815738 dinD	dinD	3815783	45
TU-2030	FWD	3816897	3817514	617 MU-1321	yicG	yicG	3816897	
TU-2031	FWD	3819431	3825281	5850 MU-1322;MU-1323	3819411 gmk;rpoZ;spoT;trmH;recG	gmk	3819451	40
TU-2032	FWD	3819431	3825281	5850 MU-1322;MU-1323	3819419 gmk;rpoZ;spoT;trmH;recG	gmk	3819451	32
TU-2033	FWD	3819431	3825281	5850 MU-1322;MU-1323	3819424 gmk;rpoZ;spoT;trmH;recG	gmk	3819451	27
TU-2034	FWD	3820131	3825281	5150 MU-1323	3819942 rpoZ;spoT;trmH;recG	rpoZ	3820129	187
TU-2035	FWD	3820131	3825281	5150 MU-1323	3819946 rpoZ;spoT;trmH;recG	rpoZ	3820129	183
TU-2036	FWD	3820131	3825281	5150 MU-1323	3820008 rpoZ;spoT;trmH;recG	rpoZ	3820129	121
TU-2037	FWD	3820131	3825281	5150 MU-1323	3820101 rpoZ;spoT;trmH;recG	rpoZ	3820129	28
TU-2038	FWD	3820131	3825281	5150 MU-1323	3820103 rpoZ;spoT;trmH;recG	rpoZ	3820129	26
TU-2039	FWD	3826956	3828331	1375 MU-1324	3826943 yicE	yicE	3826968	25
TU-2040	FWD	3826956	3828331	1375 MU-1324	3826958 yicE	yicE	3826968	10
TU-2041	FWD	3828481	3830181	1700 MU-1325	3828454 yicH	yicH	3828480	26
TU-2042	FWD	3834206	3834356	150 MU-1326	3834176 selC	selC	3834245	69
TU-2043	FWD	3834448	3834579	131 MU-1327	yicT	yicT	3834448	
TU-2044	FWD	3834976	3836160	1184 MU-1328	setC	setC	3834976	
TU-2045	FWD	3836256	3837206	950 MU-1329	3836236 yicL	yicL	3836271	35
TU-2046	FWD	3838031	3838531	500 MU-1330	3838038 yicS	yicS	3838238	200
TU-2047	FWD	3842156	3843556	1400 MU-1331	3841958 ade	ade	3841987	29
TU-2048	FWD	3842156	3843556	1400 MU-1331	3841961 ade	ade	3841987	26
TU-2049	FWD	3842156	3843556	1400 MU-1331	3842137 ade	ade	3841987	-150
TU-2050	FWD	3842156	3843556	1400 MU-1331	3842154 ade	ade	3841987	-167
TU-2051	FWD	3851383	3851683	300 MU-1332	3851354 tisA;tisB	tisA	3851466	112
TU-2052	FWD	3852008	3852958	950 MU-1333	emrD	emrD	3851945	

TU-2053	FWD	3854458	3854683	225 MU-1334	3854453 yidI	yidI	3854438	-15
TU-2054	FWD	3856958	3857133	175 MU-1335	NT			
TU-2055	FWD	3858276	3859199	923 MU-1336	3858282 yidL	yidL	3858276	-6
TU-2056	FWD	3861922	3862638	716 MU-1337	3861646 yidP	yidP	3861922	276
TU-2057	FWD	3865583	3866558	975 MU-1338	3865466 yidQ	yidQ	3865751	285
TU-2058	FWD	3865583	3866558	975 MU-1338	3865740 yidQ	yidQ	3865751	11
TU-2059	FWD	3865583	3866558	975 MU-1338	3865744 yidQ	yidQ	3865751	7
TU-2060	FWD	3865583	3866558	975 MU-1338	3865754 yidQ	yidQ	3865751	-3
TU-2061	FWD	3867400	3868464	1064 MU-1339	3867376 cbrA	cbrA	3867400	24
TU-2062	FWD	3873368	3874168	800 MU-1340	3873331 yidX	yidX	3873461	130
TU-2063	FWD	3873368	3874168	800 MU-1340	3873461 yidX	yidX	3873461	0
TU-2064	FWD	3882121	3884746	2625 MU-1341;MU-1342	3882073 rpmH; rnpA; yidD; yidC	rpmH	3882359	286
TU-2065	FWD	3882121	3884746	2625 MU-1341;MU-1342	3882139 rpmH; rnpA; yidD; yidC	rpmH	3882359	220
TU-2066	FWD	3882121	3884746	2625 MU-1341;MU-1342	3882227 rpmH; rnpA; yidD; yidC	rpmH	3882359	132
TU-2067	FWD	3882121	3884746	2625 MU-1341;MU-1342	3882262 rpmH; rnpA; yidD; yidC	rpmH	3882359	97
TU-2068	FWD	3882121	3884746	2625 MU-1341;MU-1342	3882331 rpmH; rnpA; yidD; yidC	rpmH	3882359	28
TU-2069	FWD	3883071	3884746	1675 MU-1342	3883077 yidC	yidC	3883099	22
TU-2070	FWD	3884796	3886171	1375 MU-1343	3884796 mnmE	mnmE	3884851	55
TU-2071	FWD	3886397	3886547	150 MU-1344	3886434 tnaC	tnaC	3886458	24
TU-2072	FWD	3886753	3888168	1415 MU-1345	3886568 tnaA	tnaA	3886753	185
TU-2073	FWD	3888259	3889506	1247 MU-1346	tnaB	tnaB	3888259	
TU-2074	FWD	3889638	3890813	1175 MU-1347	mdtL	mdtL	3889638	
TU-2075	FWD	3890747	3891547	800 MU-1348	3890742 yidZ	yidZ	3890788	46
TU-2076	FWD	3891822	3893372	1550 MU-1349	3891852 yieE; yieF	yieE	3891892	40
TU-2077	FWD	3891822	3893372	1550 MU-1349	3891875 yieE; yieF	yieE	3891892	17
TU-2078	FWD	3894722	3895447	725 MU-1350	3894574 yieH	yieH	3894797	223
TU-2079	FWD	3894722	3895447	725 MU-1350	3894698 yieH	yieH	3894797	99
TU-2080	FWD	3895622	3896622	1000 MU-1351	3895504 cbrB; cbrC	cbrB	3895529	25
TU-2081	FWD	3895622	3896622	1000 MU-1351	3895618 cbrB; cbrC	cbrB	3895529	-89
TU-2082	FWD	3902422	3902897	475 MU-1352	3902442 NT			
TU-2083	FWD	3920657	3920907	250 MU-1353	3920627 NT			
TU-2084	FWD	3925182	3926082	900 MU-1354	3925155 asnA	asnA	3925178	23
TU-2085	FWD	3929132	3931157	2025 MU-1355	3929239 kup	kup	3929339	100
TU-2086	FWD	3931382	3935157	3775 MU-1356	3931345 rbsD; rbsA; rbsC; rbsB	rbsD	3931374	29
TU-2087	FWD	3935182	3936057	875 MU-1357	3935178 rbsK	rbsK	3935317	139
TU-2088	FWD	3935182	3936057	875 MU-1357	3935192 rbsK	rbsK	3935317	125
TU-2089	FWD	3936082	3937107	1025 MU-1358	3936225 rbsR	rbsR	3936250	25
TU-2090	FWD	3939482	3944885	5403 MU-1359	3939656 rrsC; gltU; rrlC; rrfC	rrsC	3939831	175
TU-2091	FWD	3939482	3944885	5403 MU-1359	3939830 rrsC; gltU; rrlC; rrfC	rrsC	3939831	1
TU-2092	FWD	3944910	3944963	53 MU-1360	aspT	aspT	3944895	
TU-2093	FWD	3944988	3945038	50 MU-1361	trpT	trpT	3944980	
TU-2094	FWD	3946088	3946438	350 MU-1362	3946073 yifE	yifE	3946109	36
TU-2095	FWD	3946088	3946438	350 MU-1362	3946081 yifE	yifE	3946109	28
TU-2096	FWD	3946088	3946438	350 MU-1362	3946093 yifE	yifE	3946109	16
TU-2097	FWD	3946488	3946713	225 MU-1363	3946474 NT			
TU-2098	FWD	3948288	3954886	6598 MU-1364	3948313 ilvL; ilvG; ilvM; ilvE; ilvD; ilvA	ilvL	3948345	32

TU-2099	FWD	3948288	3954886	6598 MU-1364	3948461 ilvL;ilvG;ilvM;ilvE;ilvD;ilvA	ilvL	3948345	-116
TU-2100	FWD	3955961	3957686	1725 MU-1365	3955939 ilvC	ilvC	3955993	54
TU-2101	FWD	3955961	3957686	1725 MU-1365	3955960 ilvC	ilvC	3955993	33
TU-2102	FWD	3955961	3957686	1725 MU-1365	3955969 ilvC	ilvC	3955993	24
TU-2103	FWD	3955961	3957686	1725 MU-1365	3955977 ilvC	ilvC	3955993	16
TU-2104	FWD	3955961	3957686	1725 MU-1365	3955987 ilvC	ilvC	3955993	6
TU-2105	FWD	3958686	3960711	2025 MU-1366	3958673 rep	rep	3958700	27
TU-2106	FWD	3963411	3963686	275 MU-1367	3963396 NT			
TU-2107	FWD	3963711	3964236	525 MU-1368	3963673 trxA	trxA	3963784	111
TU-2108	FWD	3963711	3964236	525 MU-1368	3963683 trxA	trxA	3963784	101
TU-2109	FWD	3963711	3964236	525 MU-1368	3963702 trxA	trxA	3963784	82
TU-2110	FWD	3963711	3964236	525 MU-1368	3963714 trxA	trxA	3963784	70
TU-2111	FWD	3963711	3964236	525 MU-1368	3963763 trxA	trxA	3963784	21
TU-2112	FWD	3964261	3965636	1375 MU-1369	3964185 rho	rho	3964440	255
TU-2113	FWD	3964261	3965636	1375 MU-1369	3964218 rho	rho	3964440	222
TU-2114	FWD	3964261	3965636	1375 MU-1369	3964227 rho	rho	3964440	213
TU-2115	FWD	3964261	3965636	1375 MU-1369	3964270 rho	rho	3964440	170
TU-2116	FWD	3965786	3978637	12851 MU-1370;MU-1371;MU-1372	3965913 rfe;wzzE;rffE;rffD;rffG;rffH;rffC;rffA;wzxE;rff rfe T;wzyE;rffM	rfe	3965939	26
TU-2117	FWD	3965786	3978637	12851 MU-1370;MU-1371;MU-1372	3965919 rfe;wzzE;rffE;rffD;rffG;rffH;rffC;rffA;wzxE;rff rfe T;wzyE;rffM	rfe	3965939	20
TU-2118	FWD	3966987	3978637	11650 MU-1371;MU-1372	3966885 wzzE;rffE;rffD;rffG;rffH;rffC;rffA;wzxE;rffT;w wzzE zyE;rffM	wzzE	3967054	169
TU-2119	FWD	3966987	3978637	11650 MU-1371;MU-1372	3966887 wzzE;rffE;rffD;rffG;rffH;rffC;rffA;wzxE;rffT;w wzzE zyE;rffM	wzzE	3967054	167
TU-2120	FWD	3966987	3978637	11650 MU-1371;MU-1372	3967150 wzzE;rffE;rffD;rffG;rffH;rffC;rffA;wzxE;rffT;w wzzE zyE;rffM	wzzE	3967054	-96
TU-2121	FWD	3966987	3978637	11650 MU-1371;MU-1372	3967199 wzzE;rffE;rffD;rffG;rffH;rffC;rffA;wzxE;rffT;w wzzE zyE;rffM	wzzE	3967054	-145
TU-2122	FWD	3968312	3978637	10325 MU-1372	3968173 rffE;rffD;rffG;rffH;rffC;rffA;wzxE;rffT;wzyE;rf rffE fM	rffE	3968156	-17
TU-2123	FWD	3968312	3978637	10325 MU-1372	3968253 rffE;rffD;rffG;rffH;rffC;rffA;wzxE;rffT;wzyE;rf rffE fM	rffE	3968156	-97
TU-2124	FWD	3978862	3980312	1450 MU-1373	3978846 yifK	yifK	3978910	64
TU-2125	FWD	3980337	3980837	500 MU-1374	3980385 argX;hisR;leuT;proM	argX	3980398	13
TU-2126	FWD	3980337	3980837	500 MU-1374	3980398 argX;hisR;leuT;proM	argX	3980398	0
TU-2127	FWD	3980981	3982216	1235 MU-1375	3980943 aslB	aslB	3980981	38
TU-2128	FWD	3984387	3984612	225 MU-1376	3984454 glmZ	glmZ	3984455	1
TU-2129	FWD	3988812	3988912	100 MU-1377	3988860 NT			
TU-2130	FWD	3988812	3988912	100 MU-1377	3988889 NT			
TU-2131	FWD	3988987	3991765	2778 MU-1378	3988975 cyaA	cyaA	3989176	201
TU-2132	FWD	3988987	3991765	2778 MU-1378	3989022 cyaA	cyaA	3989176	154
TU-2133	FWD	3988987	3991765	2778 MU-1378	3989081 cyaA	cyaA	3989176	95
TU-2134	FWD	3988987	3991765	2778 MU-1378	3989090 cyaA	cyaA	3989176	86
TU-2135	FWD	3992490	3995915	3425 MU-1379	3992514 yifL;dapF;yigA;xerC;yigB	yifL	3992545	31
TU-2136	FWD	3992490	3995915	3425 MU-1379	3992528 yifL;dapF;yigA;xerC;yigB	yifL	3992545	17

TU-2137	FWD	3995965	3998240	2275 MU-1380	3995930 uvrD	uvrD	3996006	76
TU-2138	FWD	3999090	4000390	1300 MU-1381	3999215 corA	corA	3999449	234
TU-2139	FWD	3999090	4000390	1300 MU-1381	3999221 corA	corA	3999449	228
TU-2140	FWD	3999090	4000390	1300 MU-1381	3999296 corA	corA	3999449	153
TU-2141	FWD	3999090	4000390	1300 MU-1381	3999326 corA	corA	3999449	123
TU-2142	FWD	4002865	4003790	925 MU-1382	4002838 pldA	pldA	4002885	47
TU-2143	FWD	4002865	4003790	925 MU-1382	4002852 pldA	pldA	4002885	33
TU-2144	FWD	4003890	4006465	2575 MU-1383	4003859 recQ;rhtC	recQ	4003887	28
TU-2145	FWD	4003890	4006465	2575 MU-1383	4003866 recQ;rhtC	recQ	4003887	21
TU-2146	FWD	4007115	4008965	1850 MU-1384	4007163 pldB;yigL	pldB	4007193	30
TU-2147	FWD	4009115	4009790	675 MU-1385	4008982 yigM	yigM	4009099	117
TU-2148	FWD	4010915	4013515	2600 MU-1386	4010909 metE	metE	4011076	167
TU-2149	FWD	4010915	4013515	2600 MU-1386	4010915 metE	metE	4011076	161
TU-2150	FWD	4010915	4013515	2600 MU-1386	4010921 metE	metE	4011076	155
TU-2151	FWD	4010915	4013515	2600 MU-1386	4010925 metE	metE	4011076	151
TU-2152	FWD	4010915	4013515	2600 MU-1386	4010930 metE	metE	4011076	146
TU-2153	FWD	4010915	4013515	2600 MU-1386	4010939 metE	metE	4011076	137
TU-2154	FWD	4010915	4013515	2600 MU-1386	4010946 metE	metE	4011076	130
TU-2155	FWD	4010915	4013515	2600 MU-1386	4010954 metE	metE	4011076	122
TU-2156	FWD	4010915	4013515	2600 MU-1386	4011033 metE	metE	4011076	43
TU-2157	FWD	4010915	4013515	2600 MU-1386	4011040 metE	metE	4011076	36
TU-2158	FWD	4010915	4013515	2600 MU-1386	4011050 metE	metE	4011076	26
TU-2159	FWD	4010915	4013515	2600 MU-1386	4011057 metE	metE	4011076	19
TU-2160	FWD	4014040	4016465	2425 MU-1387	4014410 udp;rmuC	udp	4014454	44
TU-2161	FWD	4014040	4016465	2425 MU-1387	4014418 udp;rmuC	udp	4014454	36
TU-2162	FWD	4014040	4016465	2425 MU-1387	4014427 udp;rmuC	udp	4014454	27
TU-2163	FWD	4016590	4019940	3350 MU-1388	4016743 ubiE;yigP;ubiB	ubiE	4016878	135
TU-2164	FWD	4019965	4022440	2475 MU-1389	4019890 tatA;tatB;tatC;tatD	tatA	4019968	78
TU-2165	FWD	4019965	4022440	2475 MU-1389	4019932 tatA;tatB;tatC;tatD	tatA	4019968	36
TU-2166	FWD	4019965	4022440	2475 MU-1389	4019999 tatA;tatB;tatC;tatD	tatA	4019968	-31
TU-2167	FWD	4022865	4025690	2825 MU-1390	4022835 ubiD;fre	ubiD	4023011	176
TU-2168	FWD	4022865	4025690	2825 MU-1390	4022995 ubiD;fre	ubiD	4023011	16
TU-2169	FWD	4029117	4033192	4075 MU-1391;MU-1392	4029153 pepQ;yigZ;trkH;hemG	pepQ	4029184	31
TU-2170	FWD	4029117	4033192	4075 MU-1391;MU-1392	4029161 pepQ;yigZ;trkH;hemG	pepQ	4029184	23
TU-2171	FWD	4031142	4033192	2050 MU-1392	4031257 trkH;hemG	trkH	4031168	-89
TU-2172	FWD	4031142	4033192	2050 MU-1392	4031295 trkH;hemG	trkH	4031168	-127
TU-2173	FWD	4033217	4038670	5453 MU-1393	4033095 rrsA;ileT;alaT;rrlA;rrfA	rrsA	4033554	459
TU-2174	FWD	4040095	4040420	325 MU-1394	4040070 yihD	yihD	4040092	22
TU-2175	FWD	4040445	4041350	905 MU-1395	4040414 rdoA	rdoA	4040438	24
TU-2176	FWD	4041375	4042050	675 MU-1396	4041400 dsbA	dsbA	4041441	41
TU-2177	FWD	4041375	4042050	675 MU-1396	4041406 dsbA	dsbA	4041441	35
TU-2178	FWD	4042222	4043652	1430 MU-1397	yihF	yihF	4042222	
TU-2179	FWD	4044881	4047756	2875 MU-1398	4044962 polA	polA	4044989	27
TU-2180	FWD	4047806	4048031	225 MU-1399	4047922 spf	spf	4047922	0
TU-2181	FWD	4049006	4049256	250 MU-1400	4049059 csrC	csrC	4049059	0
TU-2182	FWD	4049356	4051656	2300 MU-1401	4049330 yihI;hemN	yihI	4049370	40



TU-2183	FWD	4056306	4058231	1925 MU-1402	4056196 typA	typA	4056430	234
TU-2184	FWD	4056306	4058231	1925 MU-1402	4056241 typA	typA	4056430	189
TU-2185	FWD	4056306	4058231	1925 MU-1402	4056270 typA	typA	4056430	160
TU-2186	FWD	4056306	4058231	1925 MU-1402	4056298 typA	typA	4056430	132
TU-2187	FWD	4056306	4058231	1925 MU-1402	4056405 typA	typA	4056430	25
TU-2188	FWD	4058470	4060168	1698 MU-1403	4058442 yihL;yihM	yihL	4058470	28
TU-2189	FWD	4059188	4060168	980 MU-1404	4059011 yihM	yihM	4059188	177
TU-2190	FWD	4060270	4061535	1265 MU-1405	yihN	yihN	4060270	
TU-2191	FWD	4071783	4076458	4675 MU-1406;MU-1407	4071765 yihV;yihW;yihX;yihY;dtd;yiiD	yihV	4071762	-3
TU-2192	FWD	4073908	4076458	2550 MU-1407	4073552 yihX;yihY;dtd;yiiD	yihX	4073576	24
TU-2193	FWD	4077320	4077532	212 MU-1408	yiiE	yiiE	4077320	
TU-2194	FWD	4077774	4077992	218 MU-1409	4077718 yiiF	yiiF	4077774	56
TU-2195	FWD	4084008	4084808	800 MU-1410	4083961 fdhD	fdhD	4084039	78
TU-2196	FWD	4085025	4086080	1055 MU-1411	yiiG	yiiG	4085025	
TU-2197	FWD	4095759	4097517	1758 MU-1412	4095703 rhaS;rhaR	rhaS	4095759	56
TU-2198	FWD	4095759	4097517	1758 MU-1412	4095774 rhaS;rhaR	rhaS	4095759	-15
TU-2199	FWD	4098795	4100670	1875 MU-1413	4098782 sodA;kdgT	sodA	4098833	51
TU-2200	FWD	4098795	4100670	1875 MU-1413	4098787 sodA;kdgT	sodA	4098833	46
TU-2201	FWD	4098795	4100670	1875 MU-1413	4098818 sodA;kdgT	sodA	4098833	15
TU-2202	FWD	4098795	4100670	1875 MU-1413	4098831 sodA;kdgT	sodA	4098833	2
TU-2203	FWD	4100845	4101595	750 MU-1414	4100809 yiiM	yiiM	4100845	36
TU-2204	FWD	4100845	4101595	750 MU-1414	4100821 yiiM	yiiM	4100845	24
TU-2205	FWD	4100845	4101595	750 MU-1414	4100823 yiiM	yiiM	4100845	22
TU-2206	FWD	4103820	4104370	550 MU-1415	4103808 cpxP	cpxP	4103843	35
TU-2207	FWD	4104495	4105420	925 MU-1416	4104313 fieF	fieF	4104492	179
TU-2208	FWD	4104495	4105420	925 MU-1416	4104353 fieF	fieF	4104492	139
TU-2209	FWD	4104495	4105420	925 MU-1416	4104472 fieF	fieF	4104492	20
TU-2210	FWD	4105445	4106695	1250 MU-1417	4105495 pfkA	pfkA	4105575	80
TU-2211	FWD	4105445	4106695	1250 MU-1417	4105542 pfkA	pfkA	4105575	33
TU-2212	FWD	4105445	4106695	1250 MU-1417	4105548 pfkA	pfkA	4105575	27
TU-2213	FWD	4105445	4106695	1250 MU-1417	4105554 pfkA	pfkA	4105575	21
TU-2214	FWD	4105445	4106695	1250 MU-1417	4105562 pfkA	pfkA	4105575	13
TU-2215	FWD	4106820	4107820	1000 MU-1418	4106828 sbp	sbp	4106857	29
TU-2216	FWD	4107998	4108648	650 MU-1419	cdh	cdh	4107953	
TU-2217	FWD	4110098	4110748	650 MU-1420	4110278 yiiR	yiiR	4110338	60
TU-2218	FWD	4110873	4111773	900 MU-1421	4110750 yiiS;uspD	yiiS	4110990	240
TU-2219	FWD	4110873	4111773	900 MU-1421	4110954 yiiS;uspD	yiiS	4110990	36
TU-2220	FWD	4116373	4116973	600 MU-1422	4116450 yiiU	yiiU	4116538	88
TU-2221	FWD	4116373	4116973	600 MU-1422	4116458 yiiU	yiiU	4116538	80
TU-2222	FWD	4116373	4116973	600 MU-1422	4116467 yiiU	yiiU	4116538	71
TU-2223	FWD	4116373	4116973	600 MU-1422	4116471 yiiU	yiiU	4116538	67
TU-2224	FWD	4116373	4116973	600 MU-1422	4116502 yiiU	yiiU	4116538	36
TU-2225	FWD	4116373	4116973	600 MU-1422	4116519 yiiU	yiiU	4116538	19
TU-2226	FWD	4116373	4116973	600 MU-1422	4116526 yiiU	yiiU	4116538	12
TU-2227	FWD	4120423	4120548	125 MU-1423	4120392 NT			
TU-2228	FWD	4124898	4125248	350 MU-1424	4124936 rpmE	rpmE	4125036	100

TU-2229	FWD	4124898	4125248	350 MU-1424	4124969 rpmE	rpmE	4125036	67
TU-2230	FWD	4124898	4125248	350 MU-1424	4124975 rpmE	rpmE	4125036	61
TU-2231	FWD	4126673	4130348	3675 MU-1425	4126658 metB;metL	metB	4126695	37
TU-2232	FWD	4130598	4131723	1125 MU-1426	4130573 metF	metF	4130639	66
TU-2233	FWD	4130598	4131723	1125 MU-1426	4130610 metF	metF	4130639	29
TU-2234	FWD	4131773	4134373	2600 MU-1427	4131813 katG	katG	4131858	45
TU-2235	FWD	4131773	4134373	2600 MU-1427	4131817 katG	katG	4131858	41
TU-2236	FWD	4131773	4134373	2600 MU-1427	4131823 katG	katG	4131858	35
TU-2237	FWD	4131773	4134373	2600 MU-1427	4131834 katG	katG	4131858	24
TU-2238	FWD	4134131	4135036	905 MU-1428	yijE	yijE	4134131	
TU-2239	FWD	4140553	4145502	4949 MU-1429	frwC;frwB;pflD;pflC;frwD	frwC	4140553	
TU-2240	FWD	4148473	4149398	925 MU-1430	4148383 NT			
TU-2241	FWD	4151198	4151773	575 MU-1431	4151359 NT			
TU-2242	FWD	4152948	4156423	3475 MU-1432	4152908 argC;argB;argH	argC	4153024	116
TU-2243	FWD	4152948	4156423	3475 MU-1432	4153001 argC;argB;argH	argC	4153024	23
TU-2244	FWD	4156498	4157323	825 MU-1433	4156479 oxyR	oxyR	4156513	34
TU-2245	FWD	4156498	4157323	825 MU-1433	4156517 oxyR	oxyR	4156513	-4
TU-2246	FWD	4159110	4160385	1275 MU-1434	4159102 fabR;yijD	fabR	4159147	45
TU-2247	FWD	4159110	4160385	1275 MU-1434	4159117 fabR;yijD	fabR	4159147	30
TU-2248	FWD	4161435	4164385	2950 MU-1435;MU-1436	4161428 btuB;murI	btuB	4161662	234
TU-2249	FWD	4163360	4164385	1025 MU-1436	4163423 murI	murI	4163451	28
TU-2250	FWD	4164410	4169785	5375 MU-1437	4164242 rrsB;glT;rrlB;rrfB	rrsB	4164682	440
TU-2251	FWD	4169960	4172035	2075 MU-1438	4170057 murB;birA	murB	4170080	23
TU-2252	FWD	4173285	4175260	1975 MU-1439	4173311 thrU;tyrU;glyT;thrT;tufB	thrU	4173411	100
TU-2253	FWD	4173285	4175260	1975 MU-1439	4173411 thrU;tyrU;glyT;thrT;tufB	thrU	4173411	0
TU-2254	FWD	4175285	4176335	1050 MU-1440	4175236 secE;nusG	secE	4175381	145
TU-2255	FWD	4175285	4176335	1050 MU-1440	4175269 secE;nusG	secE	4175381	112
TU-2256	FWD	4175285	4176335	1050 MU-1440	4175319 secE;nusG	secE	4175381	62
TU-2257	FWD	4176360	4187589	11229 MU-1441;MU-1442;MU-1443	4176380 rplK;rplA;rplJ;rplL;rpoB;rpoC	rplK	4176470	90
TU-2258	FWD	4176360	4187589	11229 MU-1441;MU-1442;MU-1443	4176412 rplK;rplA;rplJ;rplL;rpoB;rpoC	rplK	4176470	58
TU-2259	FWD	4177560	4187589	10029 MU-1442;MU-1443	4177606 rplJ;rplL;rpoB;rpoC	rplJ	4178019	413
TU-2260	FWD	4177560	4187589	10029 MU-1442;MU-1443	4177645 rplJ;rplL;rpoB;rpoC	rplJ	4178019	374
TU-2261	FWD	4177560	4187589	10029 MU-1442;MU-1443	4177802 rplJ;rplL;rpoB;rpoC	rplJ	4178019	217
TU-2262	FWD	4177560	4187589	10029 MU-1442;MU-1443	4177842 rplJ;rplL;rpoB;rpoC	rplJ	4178019	177
TU-2263	FWD	4177560	4187589	10029 MU-1442;MU-1443	4177902 rplJ;rplL;rpoB;rpoC	rplJ	4178019	117
TU-2264	FWD	4177560	4187589	10029 MU-1442;MU-1443	4177941 rplJ;rplL;rpoB;rpoC	rplJ	4178019	78
TU-2265	FWD	4179035	4187589	8554 MU-1443	4179085 rpoB;rpoC	rpoB	4179268	183
TU-2266	FWD	4179035	4187589	8554 MU-1443	4179145 rpoB;rpoC	rpoB	4179268	123
TU-2267	FWD	4179035	4187589	8554 MU-1443	4179160 rpoB;rpoC	rpoB	4179268	108
TU-2268	FWD	4179035	4187589	8554 MU-1443	4179201 rpoB;rpoC	rpoB	4179268	67
TU-2269	FWD	4187809	4188348	539 MU-1444	4187644 yjaZ	yjaZ	4187809	165
TU-2270	FWD	4194749	4197524	2775 MU-1445;MU-1446;MU-1447	4194721 nudC;hemE;nfi	nudC	4194926	205
TU-2271	FWD	4194749	4197524	2775 MU-1445;MU-1446;MU-1447	4194727 nudC;hemE;nfi	nudC	4194926	199
TU-2272	FWD	4195574	4197524	1950 MU-1446;MU-1447	4195715 hemE;nfi	hemE	4195739	24
TU-2273	FWD	4195574	4197524	1950 MU-1446;MU-1447	4195747 hemE;nfi	hemE	4195739	-8
TU-2274	FWD	4196924	4197524	600 MU-1447	4196733 nfi	nfi	4196813	80

TU-2275	FWD	4197549	4198124	575 MU-1448	4197503 yjaG	yjaG	4197527	24
TU-2276	FWD	4198149	4199324	1175 MU-1449	4198163 hupA;yjaH	hupA	4198304	141
TU-2277	FWD	4198149	4199324	1175 MU-1449	4198199 hupA;yjaH	hupA	4198304	105
TU-2278	FWD	4199949	4201099	1150 MU-1450	4199842 zraS	zraS	4199949	107
TU-2279	FWD	4201274	4202599	1325 MU-1451	4201161 zraR	zraR	4201343	182
TU-2280	FWD	4201274	4202599	1325 MU-1451	4201236 zraR	zraR	4201343	107
TU-2281	FWD	4205800	4211177	5377 MU-1452	4205995 rrsE;gltV;rrlE;rrfE	rrsE	4206170	175
TU-2282	FWD	4211257	4211640	383 MU-1453	yjaA	yjaA	4211257	
TU-2283	FWD	4212227	4213252	1025 MU-1454	4212258 metA	metA	4212303	45
TU-2284	FWD	4212227	4213252	1025 MU-1454	4212274 metA	metA	4212303	29
TU-2285	FWD	4213452	4218602	5150 MU-1455;MU-1456	4213427 aceB;aceA;aceK	aceB	4213501	74
TU-2286	FWD	4213452	4218602	5150 MU-1455;MU-1456	4213455 aceB;aceA;aceK	aceB	4213501	46
TU-2287	FWD	4216552	4218602	2050 MU-1456	4216684 aceK	aceK	4216619	-65
TU-2288	FWD	4216552	4218602	2050 MU-1456	4216688 aceK	aceK	4216619	-69
TU-2289	FWD	4221832	4225507	3675 MU-1457	4221807 metH	metH	4221851	44
TU-2290	FWD	4221832	4225507	3675 MU-1457	4221810 metH	metH	4221851	41
TU-2291	FWD	4225657	4227382	1725 MU-1458	4225603 yjbB	yjbB	4225754	151
TU-2292	FWD	4225657	4227382	1725 MU-1458	4225625 yjbB	yjbB	4225754	129
TU-2293	FWD	4228382	4229283	901 MU-1459	4228359 rluF	rluF	4228377	18
TU-2294	FWD	4231608	4233558	1950 MU-1460	4231740 pgi	pgi	4231781	41
TU-2295	FWD	4231608	4233558	1950 MU-1460	4231744 pgi	pgi	4231781	37
TU-2296	FWD	4231608	4233558	1950 MU-1460	4231747 pgi	pgi	4231781	34
TU-2297	FWD	4231608	4233558	1950 MU-1460	4231755 pgi	pgi	4231781	26
TU-2298	FWD	4231608	4233558	1950 MU-1460	4231763 pgi	pgi	4231781	18
TU-2299	FWD	4234033	4237583	3550 MU-1461	4233961 yjbE;yjbF;yjbG;yjbH	yjbE	4233929	-32
TU-2300	FWD	4238333	4239233	900 MU-1462	4238446 psiE	psiE	4238348	-98
TU-2301	FWD	4244834	4248459	3625 MU-1463	4245009 malK;lambB;malM	malK	4244807	-202
TU-2302	FWD	4248726	4250306	1580 MU-1464	4248736 yjbI	yjbI	4248726	-10
TU-2303	FWD	4250434	4251959	1525 MU-1465	4250505 ubiC;ubiA	ubiC	4250529	24
TU-2304	FWD	4254492	4255092	600 MU-1466	4254480 dgkA	dgkA	4254660	180
TU-2305	FWD	4254492	4255092	600 MU-1466	4254510 dgkA	dgkA	4254660	150
TU-2306	FWD	4255142	4255667	525 MU-1467	4255110 lexA	lexA	4255138	28
TU-2307	FWD	4256117	4257117	1000 MU-1468	dinF	dinF	4255765	
TU-2308	FWD	4257242	4257442	200 MU-1469	4257202 yjbJ	yjbJ	4257260	58
TU-2309	FWD	4258344	4259329	985 MU-1470	4258190 yjbL;yjbM	yjbL	4258344	154
TU-2310	FWD	4259567	4261117	1550 MU-1471	4259493 dusA;pspG	dusA	4259737	244
TU-2311	FWD	4259567	4261117	1550 MU-1471	4259617 dusA;pspG	dusA	4259737	120
TU-2312	FWD	4262342	4264792	2450 MU-1472	4262309 dnaB;alr	dnaB	4262337	28
TU-2313	FWD	4265117	4266317	1200 MU-1473	4265105 tyrB	tyrB	4265137	32
TU-2314	FWD	4267417	4267942	525 MU-1474	4267378 aphA	aphA	4267437	59
TU-2315	FWD	4268267	4269367	1100 MU-1475	4268237 yjbQ;yjbR	yjbQ	4268261	24
TU-2316	FWD	4268267	4269367	1100 MU-1475	4268243 yjbQ;yjbR	yjbQ	4268261	18
TU-2317	FWD	4272067	4272967	900 MU-1476	4272113 ssb	ssb	4272148	35
TU-2318	FWD	4272067	4272967	900 MU-1476	4272121 ssb	ssb	4272148	27
TU-2319	FWD	4272067	4272967	900 MU-1476	4272127 ssb	ssb	4272148	21
TU-2320	FWD	4273442	4275092	1650 MU-1477	4273426 yjcC	yjcC	4273494	68

TU-2321	FWD	4275492	4275942	450 MU-1478	4275329 soxR	soxR	4275492	163
TU-2322	FWD	4275492	4275942	450 MU-1478	4275468 soxR	soxR	4275492	24
TU-2323	FWD	4276367	4277842	1475 MU-1479	4276331 yjcD	yjcD	4276502	171
TU-2324	FWD	4276367	4277842	1475 MU-1479	4276341 yjcD	yjcD	4276502	161
TU-2325	FWD	4277967	4279592	1625 MU-1480	4277939 yjcE	yjcE	4278003	64
TU-2326	FWD	4285787	4292162	6375 MU-1481	4285433 nrfA;nrfB;nrfC;nrfD;nrfE;nrfF;nrfG	nrfA	4285787	354
TU-2327	FWD	4285787	4292162	6375 MU-1481	4285560 nrfA;nrfB;nrfC;nrfD;nrfE;nrfF;nrfG	nrfA	4285787	227
TU-2328	FWD	4292418	4294443	2025 MU-1482	4292398 gltP	gltP	4292504	106
TU-2329	FWD	4292418	4294443	2025 MU-1482	4292518 gltP	gltP	4292504	-14
TU-2330	FWD	4304943	4305168	225 MU-1483	4304901 NT			
TU-2331	FWD	4311369	4311819	450 MU-1484	4311281 rpiB	rpiB	4311373	92
TU-2332	FWD	4311369	4311819	450 MU-1484	4311290 rpiB	rpiB	4311373	83
TU-2333	FWD	4311369	4311819	450 MU-1484	4311337 rpiB	rpiB	4311373	36
TU-2334	FWD	4311894	4312394	500 MU-1485	4311869 yjdP	yjdP	4311891	22
TU-2335	FWD	4325269	4327544	2275 MU-1486;MU-1487	4325082 yjdA;yjcZ	yjdA	4325158	76
TU-2336	FWD	4325269	4327544	2275 MU-1486;MU-1487	4325135 yjdA;yjcZ	yjdA	4325158	23
TU-2337	FWD	4327194	4327544	350 MU-1487	4327165 yjcZ	yjcZ	4327383	218
TU-2338	FWD	4328369	4330319	1950 MU-1488	4328343 proP	proP	4328525	182
TU-2339	FWD	4328369	4330319	1950 MU-1488	4328375 proP	proP	4328525	150
TU-2340	FWD	4328369	4330319	1950 MU-1488	4328415 proP	proP	4328525	110
TU-2341	FWD	4328369	4330319	1950 MU-1488	4328430 proP	proP	4328525	95
TU-2342	FWD	4339944	4342944	3000 MU-1489	4339847 melA;melB	melA	4339934	87
TU-2343	FWD	4339944	4342944	3000 MU-1489	4339910 melA;melB	melA	4339934	24
TU-2344	FWD	4349848	4350473	625 MU-1490	4349836 yjdI;yjdJ	yjdI	4349866	30
TU-2345	FWD	4350607	4351104	497 MU-1491	yjdK;yjdO	yjdK	4350607	
TU-2346	FWD	4359499	4359674	175 MU-1492	4359542 NT			
TU-2347	FWD	4366174	4366349	175 MU-1493	4366136 NT			
TU-2348	FWD	4366649	4367524	875 MU-1494	4366642 fxsA	fxsA	4366687	45
TU-2349	FWD	4368599	4370724	2125 MU-1495;MU-1496	4368639 groS;groL	groS	4368711	72
TU-2350	FWD	4368599	4370724	2125 MU-1495;MU-1496	4368675 groS;groL	groS	4368711	36
TU-2351	FWD	4368999	4370724	1725 MU-1496	4368639 groL	groL	4369048	409
TU-2352	FWD	4368999	4370724	1725 MU-1496	4368675 groL	groL	4369048	373
TU-2353	FWD	4368999	4370724	1725 MU-1496	4368682 groL	groL	4369048	366
TU-2354	FWD	4368999	4370724	1725 MU-1496	4368715 groL	groL	4369048	333
TU-2355	FWD	4368999	4370724	1725 MU-1496	4368920 groL	groL	4369048	128
TU-2356	FWD	4368999	4370724	1725 MU-1496	4368932 groL	groL	4369048	116
TU-2357	FWD	4368999	4370724	1725 MU-1496	4368981 groL	groL	4369048	67
TU-2358	FWD	4368999	4370724	1725 MU-1496	4368990 groL	groL	4369048	58
TU-2359	FWD	4370774	4371574	800 MU-1497	4370784 yjeI	yjeI	4370832	48
TU-2360	FWD	4373624	4374299	675 MU-1498	4373678 efp	efp	4373722	44
TU-2361	FWD	4374349	4374474	125 MU-1499	ecnA	ecnA	4374340	
TU-2362	FWD	4374549	4374774	225 MU-1500	4374533 ecnB	ecnB	4374576	43
TU-2363	FWD	4374799	4375249	450 MU-1501	4374822 sugE	sugE	4374898	76
TU-2364	FWD	4380549	4381599	1050 MU-1502	4380464 poxA	poxA	4380666	202
TU-2365	FWD	4380549	4381599	1050 MU-1502	4380642 poxA	poxA	4380666	24
TU-2366	FWD	4381862	4384041	2179 MU-1503	yjeM;yjeN;yjeO	yjeM	4381862	

TU-2367	FWD	4389625	4390276	651 MU-1504	4389584 orn	orn	4389627	43
TU-2368	FWD	4389625	4390276	651 MU-1504	4389592 orn	orn	4389627	35
TU-2369	FWD	4389625	4390276	651 MU-1504	4389598 orn	orn	4389627	29
TU-2370	FWD	4390302	4390727	425 MU-1505	4390242 glyV;glyX;glyY	glyV	4390383	141
TU-2371	FWD	4391727	4402308	10581 MU-1506;MU-1507;MU-1508;MU-1509;MU-1510	4391699 yjeF;yjeE;amiB;mutL;miaA;hfq;hflX;hflK;hflC	yjeF	4392089	390
TU-2372	FWD	4391727	4402308	10581 MU-1506;MU-1507;MU-1508;MU-1509;MU-1510	4391960 yjeF;yjeE;amiB;mutL;miaA;hfq;hflX;hflK;hflC	yjeF	4392089	129
TU-2373	FWD	4391727	4402308	10581 MU-1506;MU-1507;MU-1508;MU-1509;MU-1510	4392051 yjeF;yjeE;amiB;mutL;miaA;hfq;hflX;hflK;hflC	yjeF	4392089	38
TU-2374	FWD	4393302	4402308	9006 MU-1507;MU-1508;MU-1509;MU-1510	4393183 yjeE;amiB;mutL;miaA;hfq;hflX;hflK;hflC	yjeE	4393608	425
TU-2375	FWD	4395127	4402308	7181 MU-1508;MU-1509;MU-1510	4395239 mutL;miaA;hfq;hflX;hflK;hflC	mutL	4395435	196
TU-2376	FWD	4397402	4402308	4906 MU-1509;MU-1510	4396973 miaA;hfq;hflX;hflK;hflC	miaA	4397275	302
TU-2377	FWD	4397402	4402308	4906 MU-1509;MU-1510	4397075 miaA;hfq;hflX;hflK;hflC	miaA	4397275	200
TU-2378	FWD	4397402	4402308	4906 MU-1509;MU-1510	4397246 miaA;hfq;hflX;hflK;hflC	miaA	4397275	29
TU-2379	FWD	4397402	4402308	4906 MU-1509;MU-1510	4397315 miaA;hfq;hflX;hflK;hflC	miaA	4397275	-40
TU-2380	FWD	4397402	4402308	4906 MU-1509;MU-1510	4397421 miaA;hfq;hflX;hflK;hflC	miaA	4397275	-146
TU-2381	FWD	4398258	4402308	4050 MU-1510	4398256 hfq;hflX;hflK;hflC	hfq	4398311	55
TU-2382	FWD	4398258	4402308	4050 MU-1510	4398275 hfq;hflX;hflK;hflC	hfq	4398311	36
TU-2383	FWD	4402533	4402608	75 MU-1511	4402337 yjeT	yjeT	4402409	72
TU-2384	FWD	4402533	4402608	75 MU-1511	4402348 yjeT	yjeT	4402409	61
TU-2385	FWD	4402708	4404008	1300 MU-1512	4402683 purA	purA	4402710	27
TU-2386	FWD	4402708	4404008	1300 MU-1512	4402688 purA	purA	4402710	22
TU-2387	FWD	4404058	4404133	75 MU-1513	4403905 NT			
TU-2388	FWD	4404058	4404133	75 MU-1513	4403916 NT			
TU-2389	FWD	4404183	4407933	3750 MU-1514;MU-1515	4404175 nsrR;rnr;rlmB	nsrR	4404213	38
TU-2390	FWD	4407258	4407933	675 MU-1515	4407240 rlmB	rlmB	4407298	58
TU-2391	FWD	4407258	4407933	675 MU-1515	4407246 rlmB	rlmB	4407298	52
TU-2392	FWD	4408156	4409274	1118 MU-1516	4407962 yjfI;yjfJ	yjfI	4408156	194
TU-2393	FWD	4409325	4412214	2889 MU-1517	4409333 yjfK;yjfL;yjfM;yjfC	yjfK	4409325	-8
TU-2394	FWD	4412295	4413970	1675 MU-1518	4412272 aidB	aidB	4412298	26
TU-2395	FWD	4414995	4415645	650 MU-1519	4414959 yjfP	yjfP	4414975	16
TU-2396	FWD	4418003	4422409	4406 MU-1520	ulaA;ulaB;ulaC;ulaD;ulaE;ulaF	ulaA	4418003	
TU-2397	FWD	4422920	4424570	1650 MU-1521	4423048 rpsF;priB;rpsR;rplI	rpsF	4423141	93
TU-2398	FWD	4422920	4424570	1650 MU-1521	4423050 rpsF;priB;rpsR;rplI	rpsF	4423141	91
TU-2399	FWD	4425145	4425170	25 MU-1522	4424995 NT			
TU-2400	FWD	4425717	4426118	401 MU-1523	ytfA	ytfA	4425717	
TU-2401	FWD	4426870	4427570	700 MU-1524	4426887 fklB	fklB	4426958	71
TU-2402	FWD	4426870	4427570	700 MU-1524	4426894 fklB	fklB	4426958	64
TU-2403	FWD	4426870	4427570	700 MU-1524	4426931 fklB	fklB	4426958	27
TU-2404	FWD	4427795	4428945	1150 MU-1525	4427835 cycA	cycA	4427887	52
TU-2405	FWD	4428970	4429870	900 MU-1526	4428853 NT			
TU-2406	FWD	4428970	4429870	900 MU-1526	4429034 NT			
TU-2407	FWD	4428970	4429870	900 MU-1526	4429105 NT			
TU-2408	FWD	4432145	4432845	700 MU-1527	4432106 ytfH	ytfH	4432136	30

TU-2409	FWD	4434620	4435570	950 MU-1528	4434587 cysQ	cysQ	4434778	191
TU-2410	FWD	4434620	4435570	950 MU-1528	4434590 cysQ	cysQ	4434778	188
TU-2411	FWD	4434620	4435570	950 MU-1528	4434600 cysQ	cysQ	4434778	178
TU-2412	FWD	4435730	4436668	938 MU-1529	ytfI	ytfI	4435730	
TU-2413	FWD	4437170	4437470	300 MU-1530	4437157 NT			
TU-2414	FWD	4437496	4438096	600 MU-1531	4437534 ytfK	ytfK	4437610	76
TU-2415	FWD	4437496	4438096	600 MU-1531	4437536 ytfK	ytfK	4437610	74
TU-2416	FWD	4437496	4438096	600 MU-1531	4437667 ytfK	ytfK	4437610	-57
TU-2417	FWD	4440222	4446247	6025 MU-1532	4440245 ytfM;ytfN;ytfP	ytfM	4440405	160
TU-2418	FWD	4440222	4446247	6025 MU-1532	4440274 ytfM;ytfN;ytfP	ytfM	4440405	131
TU-2419	FWD	4440222	4446247	6025 MU-1532	4440298 ytfM;ytfN;ytfP	ytfM	4440405	107
TU-2420	FWD	4440222	4446247	6025 MU-1532	4440313 ytfM;ytfN;ytfP	ytfM	4440405	92
TU-2421	FWD	4446472	4447197	725 MU-1533	4446453 chpS;chpB	chpS	4446470	17
TU-2422	FWD	4447947	4452772	4825 MU-1534	4447938 ytfQ;ytfR;ytfT;yjff	ytfQ	4447985	47
TU-2423	FWD	4447947	4452772	4825 MU-1534	4447946 ytfQ;ytfR;ytfT;yjff	ytfQ	4447985	39
TU-2424	FWD	4453797	4455297	1500 MU-1535	4453785 mpl	mpl	4453808	23
TU-2425	FWD	4455997	4457847	1850 MU-1536;MU-1537	4455967 pmbA;cybC	pmbA	4455982	15
TU-2426	FWD	4457397	4457847	450 MU-1537	4457596 cybC	cybC	4457513	-83
TU-2427	FWD	4465406	4468660	3254 MU-1538;MU-1539	4465385 mgtA;NT	mgtA	4465648	263
TU-2428	FWD	4465406	4468660	3254 MU-1538;MU-1539	4465514 mgtA;NT	mgtA	4465648	134
TU-2429	FWD	4465406	4468660	3254 MU-1538;MU-1539	4465552 mgtA;NT	mgtA	4465648	96
TU-2430	FWD	4467510	4468660	1150 MU-1539	4467531 NT			
TU-2431	FWD	4472160	4472785	625 MU-1540	4472119 yjgJ	yjgJ	4472147	28
TU-2432	FWD	4472160	4472785	625 MU-1540	4472123 yjgJ	yjgJ	4472147	24
TU-2433	FWD	4472885	4473360	475 MU-1541	4472852 yjgK	yjgK	4472885	33
TU-2434	FWD	4473460	4475274	1814 MU-1542	4473418 yjgL	yjgL	4473460	42
TU-2435	FWD	4475235	4475410	175 MU-1543	4475183 NT			
TU-2436	FWD	4476435	4477010	575 MU-1544	4476468 rraB	rraB	4476496	28
TU-2437	FWD	4477753	4478949	1196 MU-1545	yjgN	yjgN	4477753	
TU-2438	FWD	4484013	4486338	2325 MU-1546	4484153 yjgP;yjgQ	yjgP	4484241	88
TU-2439	FWD	4492763	4493163	400 MU-1547	4492620 idnK	idnK	4492646	26
TU-2440	FWD	4494438	4494513	75 MU-1548	4494428 leuX	leuX	4494428	0
TU-2441	FWD	4494563	4495888	1325 MU-1549	4494472 intB	intB	4494698	226
TU-2442	FWD	4496038	4498088	2050 MU-1550	4496128 insC;insD	insC	4496295	167
TU-2443	FWD	4499283	4499612	329 MU-1551	yjgZ	yjgZ	4499283	
TU-2444	FWD	4502438	4504163	1725 MU-1552	4501862 yjhB;yjhC;ythA	yjhB	4502081	219
TU-2445	FWD	4502438	4504163	1725 MU-1552	4501907 yjhB;yjhC;ythA	yjhB	4502081	174
TU-2446	FWD	4504988	4505388	400 MU-1553	yjhE;insO	yjhE	4504884	
TU-2447	FWD	4505538	4506163	625 MU-1554	4505417 NT			
TU-2448	FWD	4507063	4507888	825 MU-1555	4506976 insO;yjhV	insO	4507032	56
TU-2449	FWD	4516395	4517295	900 MU-1556	4516534 insA;insB	insA	4516550	16
TU-2450	FWD	4518845	4519845	1000 MU-1557	4518966 NT			
TU-2451	FWD	4524020	4524345	325 MU-1558	4524136 NT			
TU-2452	FWD	4526020	4526445	425 MU-1559	4525999 ryjB	ryjB	4526000	1
TU-2453	FWD	4532145	4533145	1000 MU-1560	4532242 NT			
TU-2454	FWD	4532814	4534054	1240 MU-1561	yjhR	yjhR	4532814	

TU-2455	FWD	4534470	4534670	200 MU-1562	4534426 NT				
TU-2456	FWD	4538745	4539520	775 MU-1563	4538709 fimB	fimB	4538980	271	
TU-2457	FWD	4539995	4540545	550 MU-1564	4540073 fimE	fimE	4540060	-13	
TU-2458	FWD	4541046	4547721	6675 MU-1565;MU-1566;MU-1567;MU-1568	4541107 fimA;fimI;fimC;fimD;fimF;fimG;fimH	fimA	4541138	31	
TU-2459	FWD	4542546	4547721	5175 MU-1566;MU-1567;MU-1568	4542527 fimC;fimD;fimF;fimG;fimH	fimC	4542327	-200	
TU-2460	FWD	4544046	4547721	3675 MU-1567;MU-1568	4544032 fimD;fimF;fimG;fimH	fimD	4543119	-913	
TU-2461	FWD	4544046	4547721	3675 MU-1567;MU-1568	4544203 fimD;fimF;fimG;fimH	fimD	4543119	-1084	
TU-2462	FWD	4546971	4547721	750 MU-1568	4546952 fimH	fimH	4546831	-121	
TU-2463	FWD	4548821	4548946	125 MU-1569	4548770 NT				
TU-2464	FWD	4549471	4552371	2900 MU-1570	4549544 uxuA;uxuB	uxuA	4549659	115	
TU-2465	FWD	4552521	4553346	825 MU-1571	4552503 uxuR	uxuR	4552599	96	
TU-2466	FWD	4552521	4553346	825 MU-1571	4552566 uxuR	uxuR	4552599	33	
TU-2467	FWD	4554621	4555371	750 MU-1572	4554785 yjiD	yjiD	4555016	231	
TU-2468	FWD	4558872	4559522	650 MU-1573	kptA	kptA	4558953		
TU-2469	FWD	4561397	4561723	326 MU-1574	4561417 NT				
TU-2470	FWD	4567021	4567941	920 MU-1575	yjiP	yjiP	4567021		
TU-2471	FWD	4567681	4568231	550 MU-1576	4567522 NT				
TU-2472	FWD	4567681	4568231	550 MU-1576	4567539 NT				
TU-2473	FWD	4567681	4568231	550 MU-1576	4567626 NT				
TU-2474	FWD	4567681	4568231	550 MU-1576	4567630 NT				
TU-2475	FWD	4569756	4569856	100 MU-1577	yjiS	yjiS	4569774		
TU-2476	FWD	4570219	4574994	4775 MU-1578	4570182 yjiT;yjiV	yjiT	4570437	255	
TU-2477	FWD	4570219	4574994	4775 MU-1578	4570222 yjiT;yjiV	yjiT	4570437	215	
TU-2478	FWD	4570219	4574994	4775 MU-1578	4570371 yjiT;yjiV	yjiT	4570437	66	
TU-2479	FWD	4570219	4574994	4775 MU-1578	4570385 yjiT;yjiV	yjiT	4570437	52	
TU-2480	FWD	4570219	4574994	4775 MU-1578	4570406 yjiT;yjiV	yjiT	4570437	31	
TU-2481	FWD	4576569	4576694	125 MU-1579	4576539 NT				
TU-2482	FWD	4577895	4578045	150 MU-1580	4577858 symR	symR	4577858	0	
TU-2483	FWD	4584974	4585949	975 MU-1581	4584938 mrr	mrr	4584972	34	
TU-2484	FWD	4584974	4585949	975 MU-1581	4584955 mrr	mrr	4584972	17	
TU-2485	FWD	4589749	4591149	1400 MU-1582	4589656 tsr	tsr	4589680	24	
TU-2486	FWD	4594049	4594924	875 MU-1583	4594170 yjjN	yjjN	4594022	-148	
TU-2487	FWD	4601500	4602860	1360 MU-1584	yjjQ;bgIJ	yjjQ	4601500		
TU-2488	FWD	4603749	4604849	1100 MU-1585	4603800 yjjZ	yjjZ	4603827	27	
TU-2489	FWD	4605824	4609024	3200 MU-1586	4605804 holD;rimI;yjjG;prfC	holD	4605826	22	
TU-2490	FWD	4609174	4610374	1200 MU-1587	4609175 osmY;ytjA	osmY	4609419	244	
TU-2491	FWD	4609174	4610374	1200 MU-1587	4609257 osmY;ytjA	osmY	4609419	162	
TU-2492	FWD	4609174	4610374	1200 MU-1587	4609269 osmY;ytjA	osmY	4609419	150	
TU-2493	FWD	4609174	4610374	1200 MU-1587	4609356 osmY;ytjA	osmY	4609419	63	
TU-2494	FWD	4609174	4610374	1200 MU-1587	4609391 osmY;ytjA	osmY	4609419	28	
TU-2495	FWD	4610424	4612649	2225 MU-1588	4610406 yjjU;yjjV	yjjU	4610434	28	
TU-2496	FWD	4614224	4615274	1050 MU-1589	4614203 NT				
TU-2497	FWD	4615324	4619599	4275 MU-1590;MU-1591	4615133 deoC;deoA;deoB;deoD	deoC	4615346	213	
TU-2498	FWD	4615324	4619599	4275 MU-1590;MU-1591	4615243 deoC;deoA;deoB;deoD	deoC	4615346	103	
TU-2499	FWD	4615324	4619599	4275 MU-1590;MU-1591	4615251 deoC;deoA;deoB;deoD	deoC	4615346	95	

TU-2500	FWD	4615324	4619599	4275 MU-1590;MU-1591	4615300 deoC;deoA;deoB;deoD	deoC	4615346	46
TU-2501	FWD	4615324	4619599	4275 MU-1590;MU-1591	4615316 deoC;deoA;deoB;deoD	deoC	4615346	30
TU-2502	FWD	4617474	4619599	2125 MU-1591	4617590 deoB;deoD	deoB	4617626	36
TU-2503	FWD	4617474	4619599	2125 MU-1591	4617600 deoB;deoD	deoB	4617626	26
TU-2504	FWD	4619799	4620949	1150 MU-1592	4619764 yjjJ	yjjJ	4619792	28
TU-2505	FWD	4622799	4626849	4050 MU-1593;MU-1594	4622879 serB;radA;nadR	serB	4622918	39
TU-2506	FWD	4625249	4626849	1600 MU-1594	4625326 nadR	nadR	4625338	12
TU-2507	FWD	4628724	4630699	1975 MU-1595	4628705 slt	slt	4628756	51
TU-2508	FWD	4628724	4630699	1975 MU-1595	4628733 slt	slt	4628756	23
TU-2509	FWD	4630749	4631274	525 MU-1596	4630721 trpR	trpR	4630783	62
TU-2510	FWD	4630749	4631274	525 MU-1596	4630727 trpR	trpR	4630783	56
TU-2511	FWD	4631724	4632474	750 MU-1597	4631778 ytjC	ytjC	4631820	42
TU-2512	FWD	4631724	4632474	750 MU-1597	4631788 ytjC	ytjC	4631820	32
TU-2513	FWD	4633299	4635724	2425 MU-1598	4633345 creA;creB;creC	creA	4633544	199
TU-2514	FWD	4633299	4635724	2425 MU-1598	4633366 creA;creB;creC	creA	4633544	178
TU-2515	FWD	4633299	4635724	2425 MU-1598	4633418 creA;creB;creC	creA	4633544	126
TU-2516	FWD	4636324	4637449	1125 MU-1599	4636134 creD	creD	4636201	67
TU-2517	FWD	4638493	4638543	50 MU-1600	yjjY	yjjY	4638425	
TU-2518	FWD	4638743	4639618	875 MU-1601	4638666 yjtD	yjtD	4638965	299
TU-2519	REV	5450	6450	1000 MU-1602	6482 yaaA	yaaA	5683	23
TU-2520	REV	6800	8175	1375 MU-1603	8053 yaaJ	yaaJ	6529	94
TU-2521	REV	9975	10475	500 MU-1604	10430 yaaH	yaaH	9928	-64
TU-2522	REV	10826	11226	400 MU-1605	yaaW;yaaI	yaaI	11382	
TU-2523	REV	16201	17176	975 MU-1606	17146 hokC;mokC	mokC	16751	186
TU-2524	REV	19826	20651	825 MU-1607	20599 insB;insA	insA	20233	91
TU-2525	REV	20801	21201	400 MU-1608	21112 rpsT	rpsT	20815	34
TU-2526	REV	20801	21201	400 MU-1608	21118 rpsT	rpsT	20815	40
TU-2527	REV	20801	21201	400 MU-1608	21159 rpsT	rpsT	20815	81
TU-2528	REV	20801	21201	400 MU-1608	21207 rpsT	rpsT	20815	129
TU-2529	REV	34759	36409	1650 MU-1609	36281 caiE;caiD	caiD	35377	11
TU-2530	REV	34759	36409	1650 MU-1609	36358 caiE;caiD	caiD	35377	88
TU-2531	REV	34759	36409	1650 MU-1609	36430 caiE;caiD	caiD	35377	160
TU-2532	REV	34759	36409	1650 MU-1609	36489 caiE;caiD	caiD	35377	219
TU-2533	REV	34759	37684	2925 MU-1609;MU-1610	37942 caiE;caiD;caiC	caiC	36271	103
TU-2534	REV	34759	39909	5150 MU-1609;MU-1610;MU-1611	39918 caiE;caiD;caiC;caiB	caiB	37898	803
TU-2535	REV	34759	41931	7172 MU-1609;MU-1610;MU-1611;MU-1612	caiE;caiD;caiC;caiB;caiA;caiT	caiT	40417	
TU-2536	REV	50384	52034	1650 MU-1613	52034 apaH;apaG	apaG	51229	428
TU-2537	REV	50384	52034	1650 MU-1613	52077 apaH;apaG	apaG	51229	471
TU-2538	REV	50384	52034	1650 MU-1613	52084 apaH;apaG	apaG	51229	478
TU-2539	REV	50384	52659	2275 MU-1613;MU-1614	52595 apaH;apaG;ksgA	ksgA	51609	165
TU-2540	REV	50384	52659	2275 MU-1613;MU-1614	52654 apaH;apaG;ksgA	ksgA	51609	224
TU-2541	REV	50384	55284	4900 MU-1613;MU-1614;MU-1615	55387 apaH;apaG;ksgA;pdxA;surA	surA	53416	685
TU-2542	REV	50384	57384	7000 MU-1613;MU-1614;MU-1615;MU-1616	57156 imp	imp	54755	47



TU-2543	REV	50384	57384	7000 MU-1613;MU-1614;MU-1615;MU-1616	57241 imp	imp	54755	132
TU-2544	REV	50384	57384	7000 MU-1613;MU-1614;MU-1615;MU-1616	57253 imp	imp	54755	144
TU-2545	REV	59659	63559	3900 MU-1617	63357 rluA;hepA	hepA	60358	93
TU-2546	REV	59659	63559	3900 MU-1617	63468 rluA;hepA	hepA	60358	204
TU-2547	REV	59659	63559	3900 MU-1617	63531 rluA;hepA	hepA	60358	267
TU-2548	REV	59659	63559	3900 MU-1617	63588 rluA;hepA	hepA	60358	324
TU-2549	REV	63734	65784	2050 MU-1618	65803 polB	polB	63429	23
TU-2550	REV	66409	70034	3625 MU-1619	70077 araD;araA;araB	araB	68348	29
TU-2551	REV	72084	75859	3775 MU-1620	75664 thiQ;thiP;tbpA;sroA	sroA	75516	56
TU-2552	REV	72084	77359	5275 MU-1620;MU-1621	77336 thiQ;thiP;tbpA;sroA;sgrR	sgrR	75644	37
TU-2553	REV	78734	83759	5025 MU-1622	83728 leuD;leuC;leuB;leuA;leuL	leuL	83622	20
TU-2554	REV	78734	83759	5025 MU-1622	83735 leuD;leuC;leuB;leuA;leuL	leuL	83622	27
TU-2555	REV	111359	112759	1400 MU-1623	112699 yacG;yacF	yacF	111856	100
TU-2556	REV	111359	112759	1400 MU-1623	112703 yacG;yacF	yacF	111856	104
TU-2557	REV	111359	112759	1400 MU-1623	112757 yacG;yacF	yacF	111856	158
TU-2558	REV	111359	113284	1925 MU-1623;MU-1624	113322 yacG;yacF;coaE	coaE	112599	103
TU-2559	REV	114459	117009	2550 MU-1625	117052 hofC;hofB	hofB	115714	-47
TU-2560	REV	117109	117549	440 MU-1626	ppdD	ppdD	117109	
TU-2561	REV	117784	118659	875 MU-1627	118679 nadC	nadC	117752	34
TU-2562	REV	120034	121759	1725 MU-1628	121647 aroP	aroP	120178	96
TU-2563	REV	120034	121759	1725 MU-1628	121676 aroP	aroP	120178	125
TU-2564	REV	122697	122857	160 MU-1629	tp2	tp2	122697	
TU-2565	REV	129407	131260	1853 MU-1630	yacH	yacH	129407	
TU-2566	REV	134796	136546	1750 MU-1631	136550 speD;speE	speE	135598	86
TU-2567	REV	136596	136946	350 MU-1632	136939 yacC	yacC	136570	22
TU-2568	REV	136596	136946	350 MU-1632	136942 yacC	yacC	136570	25
TU-2569	REV	138696	141221	2525 MU-1633	141254 gcd	gcd	138835	29
TU-2570	REV	138696	141221	2525 MU-1633	141263 gcd	gcd	138835	38
TU-2571	REV	141996	142721	725 MU-1634	142694 can	can	142008	24
TU-2572	REV	141996	142721	725 MU-1634	142703 can	can	142008	33
TU-2573	REV	146250	146725	475 MU-1635	146751 panD	panD	146314	57
TU-2574	REV	146250	146725	475 MU-1635	146754 panD	panD	146314	60
TU-2575	REV	147975	149601	1626 MU-1636	149617 panC;panB	panB	148807	16
TU-2576	REV	147975	149601	1626 MU-1636	149630 panC;panB	panB	148807	29
TU-2577	REV	149715	150953	1238 MU-1637	yadC	yadC	149715	
TU-2578	REV	151003	152231	1228 MU-1638	yadK;yadL	yadL	151626	
TU-2579	REV	152243	155426	3183 MU-1639	yadM;htrE	htrE	152829	
TU-2580	REV	155461	156201	740 MU-1640	ecpD	ecpD	155461	
TU-2581	REV	156299	156883	584 MU-1641	yadN	yadN	156299	
TU-2582	REV	157351	159201	1850 MU-1642	159154 folK;pcnB	pcnB	157729	28
TU-2583	REV	157351	159201	1850 MU-1642	159166 folK;pcnB	pcnB	157729	40
TU-2584	REV	157351	159201	1850 MU-1642	159171 folK;pcnB	pcnB	157729	45
TU-2585	REV	159251	160751	1500 MU-1643	160651 yadB;dksA	dksA	160149	47
TU-2586	REV	159251	160751	1500 MU-1643	160657 yadB;dksA	dksA	160149	53

TU-2587	REV	159251	160751	1500 MU-1643	160760 yadB;dksA	dksA	160149	156
TU-2588	REV	160776	162026	1250 MU-1644	162053 sfsA;ligT	ligT	161501	22
TU-2589	REV	167026	167401	375 MU-1645	167416 NT			
TU-2590	REV	173326	174976	1650 MU-1646	174907 hemL	hemL	173602	25
TU-2591	REV	173326	174976	1650 MU-1646	174992 hemL	hemL	173602	110
TU-2592	REV	176951	179151	2200 MU-1647	179181 yadS;btuF;mtn	mtn	178455	28
TU-2593	REV	183607	184207	600 MU-1648	184122 yaeH	yaeH	183709	27
TU-2594	REV	183607	184207	600 MU-1648	184124 yaeH	yaeH	183709	29
TU-2595	REV	184257	185069	812 MU-1649	yaeI	yaeI	184257	
TU-2596	REV	184932	186032	1100 MU-1650	185972 dapD	dapD	185123	25
TU-2597	REV	184932	186032	1100 MU-1650	185976 dapD	dapD	185123	29
TU-2598	REV	184932	186032	1100 MU-1650	186073 dapD	dapD	185123	126
TU-2599	REV	186057	188657	2600 MU-1651	glnD	glnD	185978	
TU-2600	REV	188707	189707	1000 MU-1652	189532 map;glnD	glnD	185978	882
TU-2601	REV	188707	189707	1000 MU-1652	189545 map;glnD	glnD	185978	895
TU-2602	REV	188707	189707	1000 MU-1652	189553 map;glnD	glnD	185978	903
TU-2603	REV	213557	214257	700 MU-1653	214163 rof;yaeP	yaeP	213925	38
TU-2604	REV	216179	217003	824 MU-1654	yaeF	yaeF	216179	
TU-2605	REV	217157	218832	1675 MU-1655	218831 proS	proS	217057	56
TU-2606	REV	218857	220032	1175 MU-1656	220022 yaeB;rcsF	rcsF	219591	27
TU-2607	REV	220082	222682	2600 MU-1657	222714 metQ;metI;metN	metN	221614	69
TU-2608	REV	229962	230862	900 MU-1658	230906 yafC	yafC	229967	25
TU-2609	REV	232612	234062	1450 MU-1659	233980 mltD	mltD	232597	25
TU-2610	REV	234137	234863	726 MU-1660	234821 gloB	gloB	234027	39
TU-2611	REV	235288	236013	725 MU-1661	236044 rnhA	rnhA	235535	42
TU-2612	REV	238257	239102	845 MU-1662	ykfM;yafU	yafU	238746	
TU-2613	REV	239213	240188	975 MU-1663	240216 yafV	yafV	239419	27
TU-2614	REV	240863	243488	2625 MU-1664	243346 fadE	fadE	240859	43
TU-2615	REV	245063	245888	825 MU-1665	245825 yafK	yafK	245065	20
TU-2616	REV	245938	246563	625 MU-1666	246533 yafQ;dinJ	dinJ	246242	31
TU-2617	REV	248363	250088	1725 MU-1667	lfhA	lfhA	248358	
TU-2618	REV	254263	255788	1525 MU-1668	255770 pepD	pepD	254259	54
TU-2619	REV	254263	255788	1525 MU-1668	255776 pepD	pepD	254259	60
TU-2620	REV	254263	255788	1525 MU-1668	255807 pepD	pepD	254259	91
TU-2621	REV	258269	259324	1055 MU-1669	259389 phoE	phoE	258269	65
TU-2622	REV	261739	262364	625 MU-1670	262302 NT			
TU-2623	REV	262374	264767	2393 MU-1671	ykfN;ykfI;yafW;ykfH;ykfG;yafX;ykff	ykff	264528	
TU-2624	REV	264839	265439	600 MU-1672	265294 ykfb	ykfb	264844	-17
TU-2625	REV	265334	266191	857 MU-1673	yafY;ykfL;ykfK	ykfK	266000	
TU-2626	REV	266408	267229	821 MU-1674	yafZ	yafZ	266408	
TU-2627	REV	267339	268239	900 MU-1675	268252 ykfA	ykfA	267321	68
TU-2628	REV	268513	269406	893 MU-1676	perR	perR	268513	
TU-2629	REV	273189	274364	1175 MU-1677	insH	insH	273325	
TU-2630	REV	277089	278414	1325 MU-1678	afuC;afuB	afuB	278038	
TU-2631	REV	278464	279289	825 MU-1679	279354 insB;insA	insA	278824	255
TU-2632	REV	278464	279289	825 MU-1679	279384 insB;insA	insA	278824	285

TU-2633	REV	279314	280014	700 MU-1680	279978	insX;yagB	yagB	279651	19
TU-2634	REV	280053	281207	1154 MU-1681		yagA	yagA	280053	
TU-2635	REV	287515	288440	925 MU-1682	288412	yagI	yagI	287628	26
TU-2636	REV	288490	289540	1050 MU-1683	289564	argF	argF	288525	35
TU-2637	REV	289890	290590	700 MU-1684	290655	insB;insA	insA	290295	85
TU-2638	REV	291546	292172	626 MU-1685	292170	yagK	yagK	291546	-2
TU-2639	REV	292444	294023	1579 MU-1686		yagL;yagM	yagM	293169	
TU-2640	REV	294440	294815	375 MU-1687	294844	yagN	yagN	294363	41
TU-2641	REV	294940	296290	1350 MU-1688	296372	intF	intF	294920	52
TU-2642	REV	296690	301840	5150 MU-1689	301863	yagP;yagQ;yagR;yagS;yagT	yagT	301108	66
TU-2643	REV	303140	303490	350 MU-1690	303428	ykgJ	ykgJ	303077	22
TU-2644	REV	303140	303490	350 MU-1690	303438	ykgJ	ykgJ	303077	32
TU-2645	REV	303665	305590	1925 MU-1691	305654	yagV	yagV	303719	1225
TU-2646	REV	303665	309915	6250 MU-1691;MU-1692	309944	yagV;yagW;yagX;matC;matB	matB	309308	49
TU-2647	REV	309970	310560	590 MU-1693		matA	matA	309970	
TU-2648	REV	311393	311993	600 MU-1694	312027	ykgO;ykgM	ykgM	311738	26
TU-2649	REV	312393	312468	75 MU-1695	312456	NT			
TU-2650	REV	312940	313029	89 MU-1696		ykgP	ykgP	312940	
TU-2651	REV	315293	315668	375 MU-1697	315721	NT			
TU-2652	REV	315293	315668	375 MU-1697	315750	NT			
TU-2653	REV	315710	316393	683 MU-1698		ykgA	ykgA	315710	
TU-2654	REV	316950	317791	841 MU-1699		ykgB;ykgI	ykgI	317555	
TU-2655	REV	318268	319193	925 MU-1700	319257	ykgC	ykgC	317900	32
TU-2656	REV	323920	324588	668 MU-1701		ykgH	ykgH	323920	
TU-2657	REV	324793	328568	3775 MU-1702	328585	betA;betB;betI	betI	327971	27
TU-2658	REV	332893	333668	775 MU-1703	333688	yahB	yahB	332725	31
TU-2659	REV	333749	334246	497 MU-1704		yahC	yahC	333749	
TU-2660	REV	344818	345493	675 MU-1705	345550	yahN	yahN	344890	-11
TU-2661	REV	347318	347643	325 MU-1706	347693	prpR	prpR	346081	26
TU-2662	REV	356718	357893	1175 MU-1707	357932	cynR	cynR	357015	18
TU-2663	REV	356718	357893	1175 MU-1707	357938	cynR	cynR	357015	24
TU-2664	REV	360473	361084	611 MU-1708		lacA	lacA	360473	
TU-2665	REV	361150	362403	1253 MU-1709		lacA;lacY	lacY	361150	
TU-2666	REV	362455	365529	3074 MU-1710		lacA;lacY;lacZ	lacZ	362455	
TU-2667	REV	365702	367727	2025 MU-1711	367754	lacI;mhpR	mhpR	366811	110
TU-2668	REV	376552	377602	1050 MU-1712	377685	frmB	frmB	376759	93
TU-2669	REV	376552	379129	2577 MU-1712;MU-1713	379124	frmB;frmA;frmR	frmR	378830	19
TU-2670	REV	379356	380506	1150 MU-1714	380428	yaiO;yaiX	yaiX	380068	-55
TU-2671	REV	381556	381781	225 MU-1715		NT			
TU-2672	REV	381815	383159	1344 MU-1716	383207	yaiX;yaiP	yaiP	381963	48
TU-2673	REV	383283	383840	557 MU-1717	384055	yaiS	yaiS	383283	215
TU-2674	REV	388036	388961	925 MU-1718	388978	hemB	hemB	387977	27
TU-2675	REV	390711	392586	1875 MU-1719	392607	insF;insE	insE	391826	473
TU-2676	REV	390711	392586	1875 MU-1719	392668	insF;insE	insE	391826	534
TU-2677	REV	394461	395561	1100 MU-1720	395543	ampH	ampH	394354	32
TU-2678	REV	394461	395561	1100 MU-1720	395587	ampH	ampH	394354	76

TU-2679	REV	398279	398554	275 MU-1721	398533 yaiY	yaiY	398249	-24
TU-2680	REV	399054	400329	1275 MU-1722	400176 ddiA	ddiA	399053	29
TU-2681	REV	402529	402879	350 MU-1723	402878 NT			
TU-2682	REV	402529	402879	350 MU-1723	402928 NT			
TU-2683	REV	404055	404880	825 MU-1724	404905 proC	proC	404059	37
TU-2684	REV	404055	404880	825 MU-1724	404910 proC	proC	404059	42
TU-2685	REV	407530	407755	225 MU-1725	407786 NT			
TU-2686	REV	408255	409255	1000 MU-1726	409274 rdgC	rdgC	408332	31
TU-2687	REV	410330	411731	1401 MU-1727	411748 araJ	araJ	410521	43
TU-2688	REV	411806	416181	4375 MU-1728	416200 sbcC;sbcD	sbcD	414974	24
TU-2689	REV	418281	420281	2000 MU-1729	420346 NT			
TU-2690	REV	423531	424331	800 MU-1730	424218 acpH	acpH	423561	76
TU-2691	REV	430284	431387	1103 MU-1731	431276 tsx	tsx	430353	39
TU-2692	REV	430284	431387	1103 MU-1731	431302 tsx	tsx	430353	65
TU-2693	REV	430284	431387	1103 MU-1731	431315 tsx	tsx	430353	78
TU-2694	REV	430284	431387	1103 MU-1731	431348 tsx	tsx	430353	111
TU-2695	REV	431587	432062	475 MU-1732	432100 yajI	yajI	431536	25
TU-2696	REV	436087	437587	1500 MU-1733	437508 yajO	yajO	436385	149
TU-2697	REV	437612	439622	2010 MU-1734	439624 dxs	dxs	437539	223
TU-2698	REV	437612	439622	2010 MU-1734	439634 dxs	dxs	437539	233
TU-2699	REV	437612	441162	3550 MU-1734;MU-1735	440597 dxs;ispA;xseB	xseB	440325	30
TU-2700	REV	442137	443762	1625 MU-1736	443779 yajL;panE	panE	442828	40
TU-2701	REV	442137	443762	1625 MU-1736	443784 yajL;panE	panE	442828	45
TU-2702	REV	444412	445687	1275 MU-1737	445520 yajR	yajR	444526	-370
TU-2703	REV	445787	450912	5125 MU-1738	450858 cyoE;cyoD;cyoC;cyoB;cyoA	cyoA	449887	24
TU-2704	REV	445787	450912	5125 MU-1738	450873 cyoE;cyoD;cyoC;cyoB;cyoA	cyoA	449887	39
TU-2705	REV	445787	450912	5125 MU-1738	450877 cyoE;cyoD;cyoC;cyoB;cyoA	cyoA	449887	43
TU-2706	REV	451437	453412	1975 MU-1739	453415 ampG;yajG	yajG	452813	24
TU-2707	REV	451437	453412	1975 MU-1739	453421 ampG;yajG	yajG	452813	30
TU-2708	REV	451437	453412	1975 MU-1739	453433 ampG;yajG	yajG	452813	42
TU-2709	REV	457952	458008	56 MU-1740	sraA	sraA	457952	
TU-2710	REV	464105	464755	650 MU-1741	464796 queC	queC	464076	25
TU-2711	REV	464980	466530	1550 MU-1742	466565 ybaE	ybaE	464836	29
TU-2712	REV	464980	466530	1550 MU-1742	466570 ybaE	ybaE	464836	34
TU-2713	REV	473655	474405	750 MU-1743	474425 tesB	tesB	473525	40
TU-2714	REV	474955	475505	550 MU-1744	475536 ybaZ	ybaZ	475206	-59
TU-2715	REV	476355	477955	1600 MU-1745	477866 ylaB	ylaB	476291	25
TU-2716	REV	478005	478605	600 MU-1746	478512 ylaC	ylaC	478005	37
TU-2717	REV	478655	479280	625 MU-1747	maa	maa	478591	
TU-2718	REV	479305	480083	778 MU-1748	480019 hha;ybaJ	ybaJ	479558	87
TU-2719	REV	480508	484858	4350 MU-1749	484888 acrB;acrA	acrA	483650	45
TU-2720	REV	480508	484858	4350 MU-1749	484914 acrB;acrA	acrA	483650	71
TU-2721	REV	480508	484858	4350 MU-1749	484922 acrB;acrA	acrA	483650	79
TU-2722	REV	480508	484858	4350 MU-1749	484959 acrB;acrA	acrA	483650	116
TU-2723	REV	484883	485283	400 MU-1750	485310 NT			
TU-2724	REV	489133	490133	1000 MU-1751	490112 ybaM;priC	priC	489509	76

TU-2725	REV	490208	490633	425 MU-1752	490663 NT			
TU-2726	REV	498558	499437	879 MU-1753	aes	aes	498238	
TU-2727	REV	500662	502487	1825 MU-1754	502520 ybaL	ybaL	500786	58
TU-2728	REV	500662	502487	1825 MU-1754	502564 ybaL	ybaL	500786	102
TU-2729	REV	502937	503912	975 MU-1755	503954 fsr	fsr	502700	34
TU-2730	REV	502937	503912	975 MU-1755	504035 fsr	fsr	502700	115
TU-2731	REV	502937	503912	975 MU-1755	504044 fsr	fsr	502700	124
TU-2732	REV	505512	506389	877 MU-1756	506369 ybaK	ybaK	505827	63
TU-2733	REV	505512	506389	877 MU-1756	506441 ybaK	ybaK	505827	135
TU-2734	REV	505512	506389	877 MU-1756	506463 ybaK	ybaK	505827	157
TU-2735	REV	506539	507339	800 MU-1757	507321 ybaP	ybaP	506510	17
TU-2736	REV	507814	510614	2800 MU-1758	510619 copA	copA	508099	16
TU-2737	REV	507814	510614	2800 MU-1758	510635 copA	copA	508099	32
TU-2738	REV	513489	515014	1525 MU-1759	515049 ybbJ;qmcA	qmcA	514080	52
TU-2739	REV	516364	517489	1125 MU-1760	517529 ybbN	ybbN	516649	26
TU-2740	REV	516364	517489	1125 MU-1760	517578 ybbN	ybbN	516649	75
TU-2741	REV	516364	517489	1125 MU-1760	517583 ybbN	ybbN	516649	80
TU-2742	REV	517514	519039	1525 MU-1761	519021 ybbO;tesA	tesA	518363	32
TU-2743	REV	517514	519039	1525 MU-1761	519157 ybbO;tesA	tesA	518363	168
TU-2744	REV	528839	530589	1750 MU-1762	530470 ylbG;ybbB	ybbB	529356	20
TU-2745	REV	528839	530589	1750 MU-1762	530477 ylbG;ybbB	ybbB	529356	27
TU-2746	REV	530519	531445	926 MU-1763	allS	allS	530519	
TU-2747	REV	542489	544214	1725 MU-1764	ylbA;allC	allC	543281	
TU-2748	REV	544538	545587	1049 MU-1765	allD	allD	544538	
TU-2749	REV	550514	552339	1825 MU-1766	552365 purK;purE	purE	551814	42
TU-2750	REV	552364	553764	1400 MU-1767	553683 lpxH;ppiB	ppiB	553166	23
TU-2751	REV	552364	553764	1400 MU-1767	553687 lpxH;ppiB	ppiB	553166	27
TU-2752	REV	552364	553764	1400 MU-1767	553713 lpxH;ppiB	ppiB	553166	53
TU-2753	REV	552364	553764	1400 MU-1767	553728 lpxH;ppiB	ppiB	553166	68
TU-2754	REV	552364	553764	1400 MU-1767	553781 lpxH;ppiB	ppiB	553166	121
TU-2755	REV	555414	555539	125 MU-1768	555697 ybcI	ybcI	555255	-79
TU-2756	REV	555914	556989	1075 MU-1769	556998 ybcJ;folD	folD	556098	34
TU-2757	REV	555914	556989	1075 MU-1769	557004 ybcJ;folD	folD	556098	40
TU-2758	REV	563071	563703	632 MU-1770	fimZ	fimZ	563071	
TU-2759	REV	564139	565214	1075 MU-1771	intD	intD	564038	
TU-2760	REV	565081	565599	518 MU-1772	xisD;exoD	exoD	565321	
TU-2761	REV	566839	567239	400 MU-1773	567403 NT			
TU-2762	REV	575009	576048	1039 MU-1774	nmpC	nmpC	573752	
TU-2763	REV	573816	574941	1125 MU-1775	insH	insH	573960	
TU-2764	REV	574966	576066	1100 MU-1776	576080 nmpC	nmpC	575009	32
TU-2765	REV	574966	576066	1100 MU-1776	576093 nmpC	nmpC	575009	45
TU-2766	REV	577574	578124	550 MU-1777	578131 borD	borD	577823	15
TU-2767	REV	577574	578124	550 MU-1777	578144 borD	borD	577823	28
TU-2768	REV	578407	578817	410 MU-1778	ybcV	ybcV	578407	
TU-2769	REV	579553	579653	100 MU-1779	ylcI	ylcI	579474	
TU-2770	REV	580590	580840	250 MU-1780	580786 NT			

TU-2771	REV	581375	582029	654 MU-1781	582167 ybcY	ybcY	581375	138
TU-2772	REV	583765	584865	1100 MU-1782	584873 ompT	ompT	583903	17
TU-2773	REV	583765	584865	1100 MU-1782	584881 ompT	ompT	583903	25
TU-2774	REV	583765	584865	1100 MU-1782	584887 ompT	ompT	583903	31
TU-2775	REV	585365	586140	775 MU-1783	envY	envY	585370	
TU-2776	REV	586565	590465	3900 MU-1784	590318 ybcH;nfrA	nfrA	587205	141
TU-2777	REV	586565	590465	3900 MU-1784	590483 ybcH;nfrA	nfrA	587205	306
TU-2778	REV	586565	592390	5825 MU-1784;MU-1785	592554 ybcH;nfrA;nfrB	nfrB	590164	153
TU-2779	REV	586565	592390	5825 MU-1784;MU-1785	592574 ybcH;nfrA;nfrB	nfrB	590164	173
TU-2780	REV	592665	594645	1980 MU-1786	594681 cusS;cusR	cusR	593983	15
TU-2781	REV	596220	596320	100 MU-1787	596419 NT			
TU-2782	REV	602745	603870	1125 MU-1788	603879 ybdG	ybdG	602639	-7
TU-2783	REV	604020	604645	625 MU-1789	604668 nfsB	nfsB	603994	21
TU-2784	REV	604020	604645	625 MU-1789	604676 nfsB	nfsB	603994	29
TU-2785	REV	604670	605520	850 MU-1790	605447 ybdF;ybdJ	ybdJ	605174	25
TU-2786	REV	605645	606595	950 MU-1791	606485 ybdK	ybdK	605488	-121
TU-2787	REV	606920	606945	25 MU-1792	607015 NT			
TU-2788	REV	608670	611820	3150 MU-1793	611838 entD;fepA	fepA	609477	121
TU-2789	REV	618671	621421	2750 MU-1794	621457 fepC;fepG;fepD	fepD	620408	45
TU-2790	REV	622671	624046	1375 MU-1795	623950 fepB	fepB	622777	217
TU-2791	REV	631246	631521	175 MU-1796	631486 NT			
TU-2792	REV	631596	632721	1125 MU-1797	632746 ybdH	ybdH	631612	46
TU-2793	REV	633970	635792	1822 MU-1798	ybdM;ybdN	ybdN	634572	
TU-2794	REV	635939	636841	902 MU-1799	ybdO	ybdO	635939	
TU-2795	REV	637071	637921	850 MU-1800	637825 dsbG	dsbG	637050	29
TU-2796	REV	640674	641099	425 MU-1801	641120 uspG	uspG	640662	30
TU-2797	REV	640674	641099	425 MU-1801	641126 uspG	uspG	640662	36
TU-2798	REV	642856	643381	525 MU-1802	643277 rnk	rnk	642780	87
TU-2799	REV	642856	643381	525 MU-1802	643288 rnk	rnk	642780	98
TU-2800	REV	642856	643381	525 MU-1802	643364 rnk	rnk	642780	174
TU-2801	REV	643431	644231	800 MU-1803	644257 rna	rna	643420	31
TU-2802	REV	644340	651079	6739 MU-1804	citT;citG;citX;citF;citE;citD;citC	citC	650021	
TU-2803	REV	654099	655199	1100 MU-1805	dcuC	dcuC	653806	
TU-2804	REV	656799	657174	375 MU-1806	657190 crcB	crcB	656778	29
TU-2805	REV	658499	659474	975 MU-1807	659474 lipA	lipA	658474	35
TU-2806	REV	658499	659474	975 MU-1807	659525 lipA	lipA	658474	86
TU-2807	REV	659648	660601	953 MU-1808	ybeF	ybeF	659648	
TU-2808	REV	660924	661499	575 MU-1809	661533 lipB	lipB	660860	32
TU-2809	REV	661549	661874	325 MU-1810	661929 ybeD	ybeD	661602	64
TU-2810	REV	661899	663130	1231 MU-1811	663224 dacA	dacA	661975	38
TU-2811	REV	661899	663130	1231 MU-1811	663372 dacA	dacA	661975	186
TU-2812	REV	663155	664555	1400 MU-1812	664555 rlpA	rlpA	663325	142
TU-2813	REV	663155	664555	1400 MU-1812	664684 rlpA	rlpA	663325	271
TU-2814	REV	663155	668280	5125 MU-1812;MU-1813	668291 rlpA;mrdB;mrdA;ybeA;ybeB	ybeB	667942	32
TU-2815	REV	663155	668280	5125 MU-1812;MU-1813	668296 rlpA;mrdB;mrdA;ybeA;ybeB	ybeB	667942	37
TU-2816	REV	663155	668280	5125 MU-1812;MU-1813	668430 rlpA;mrdB;mrdA;ybeA;ybeB	ybeB	667942	171

TU-2817	REV	668305	670230	1925 MU-1814	670132 cobC;nadD	nadD	669154	337
TU-2818	REV	668305	674180	5875 MU-1814;MU-1815	674060 cobC;nadD;holA;rlpB;leuS	leuS	671424	54
TU-2819	REV	668305	674180	5875 MU-1814;MU-1815	674068 cobC;nadD;holA;rlpB;leuS	leuS	671424	62
TU-2820	REV	675080	675705	625 MU-1816	675831 ybeQ	ybeQ	674793	61
TU-2821	REV	678075	678629	554 MU-1817	ybeT	ybeT	678075	
TU-2822	REV	680980	682130	1150 MU-1818	hscC	hscC	680946	
TU-2823	REV	682705	683655	950 MU-1819	683662 rihA	rihA	682700	27
TU-2824	REV	683780	685905	2125 MU-1820	686066 gltL;gltK;gltJ;sroC	sroC	685904	0
TU-2825	REV	683780	685905	2125 MU-1820	686081 gltL;gltK;gltJ;sroC	sroC	685904	15
TU-2826	REV	683780	687105	3325 MU-1820;MU-1821	687035 gltL;gltK;gltJ;sroC;gltI	gltI	686062	65
TU-2827	REV	683780	687105	3325 MU-1820;MU-1821	687066 gltL;gltK;gltJ;sroC;gltI	gltI	686062	96
TU-2828	REV	683780	687105	3325 MU-1820;MU-1821	687077 gltL;gltK;gltJ;sroC;gltI	gltI	686062	107
TU-2829	REV	687130	688405	1275 MU-1822	688559 insH	insH	687220	323
TU-2830	REV	688655	691130	2475 MU-1823	691100 lnt;ybeX	ybeX	690129	93
TU-2831	REV	688655	692705	4050 MU-1823;MU-1824	692652 lnt;ybeX;ybeY;ybeZ	ybeZ	691561	51
TU-2832	REV	688655	692705	4050 MU-1823;MU-1824	692659 lnt;ybeX;ybeY;ybeZ	ybeZ	691561	58
TU-2833	REV	688655	692705	4050 MU-1823;MU-1824	692692 lnt;ybeX;ybeY;ybeZ	ybeZ	691561	91
TU-2834	REV	692755	694205	1450 MU-1825	694214 miaB	miaB	692754	36
TU-2835	REV	695655	696030	375 MU-1826	696016 glnX;glnV;metU;glnW	glnW	695979	-37
TU-2836	REV	695655	696530	875 MU-1826;MU-1827	696389 glnX;glnV;metU;glnW;glnU;leuW;metT	metT	696280	33
TU-2837	REV	696555	698430	1875 MU-1828	698445 asnB	asnB	696736	45
TU-2838	REV	698655	699580	925 MU-1829	699578 nagD	nagD	698797	29
TU-2839	REV	698655	700980	2325 MU-1829;MU-1830	700877 nagD;nagC	nagC	699597	60
TU-2840	REV	698655	700980	2325 MU-1829;MU-1830	701088 nagD;nagC	nagC	699597	271
TU-2841	REV	698655	702905	4250 MU-1829;MU-1830;MU-1831	702929 nagD;nagC;nagA;nagB	nagB	702034	95
TU-2842	REV	709430	710105	675 MU-1832	709939 fur;uof	uof	709862	-9
TU-2843	REV	709430	710105	675 MU-1832	709945 fur;uof	uof	709862	-3
TU-2844	REV	709430	710105	675 MU-1832	709975 fur;uof	uof	709862	27
TU-2845	REV	709430	710105	675 MU-1832	710003 fur;uof	uof	709862	55
TU-2846	REV	709430	710105	675 MU-1832	710051 fur;uof	uof	709862	103
TU-2847	REV	710155	710780	625 MU-1833	710719 fldA	fldA	710158	31
TU-2848	REV	710155	710780	625 MU-1833	710744 fldA	fldA	710158	56
TU-2849	REV	710155	710780	625 MU-1833	710819 fldA	fldA	710158	131
TU-2850	REV	710830	712030	1200 MU-1834	712066 ybfE;ybfF	ybfF	711261	41
TU-2851	REV	715170	715820	650 MU-1835	ybfG	ybfG	715170	
TU-2852	REV	715944	716093	149 MU-1836	ybfI	ybfI	715944	
TU-2853	REV	716005	717680	1675 MU-1837	717567 potE	potE	716169	79
TU-2854	REV	717485	719683	2198 MU-1838	speF	speF	717485	
TU-2855	REV	720280	721055	775 MU-1839	721191 kdpE	kdpE	720279	235
TU-2856	REV	720280	721055	775 MU-1839	721208 kdpE	kdpE	720279	252
TU-2857	REV	720280	723930	3650 MU-1839;MU-1840	kdpE;kdpD	kdpD	720953	
TU-2858	REV	723630	728044	4414 MU-1841	kdpC;kdpB;kdpA;kdpF	kdpF	727955	
TU-2859	REV	740358	741858	1500 MU-1842	741892 ybgH	ybgH	740298	113
TU-2860	REV	746283	747008	725 MU-1843	747026 abrB	abrB	745946	34
TU-2861	REV	747144	752018	4874 MU-1844	ybgO;ybgP;ybgQ;ybgD	ybgD	751452	
TU-2862	REV	752133	752208	75 MU-1845	752400 NT			

TU-2863	REV	752133	752208	75 MU-1845	752404 NT			
TU-2864	REV	752383	754008	1625 MU-1846	753894 gltA		gltA	752408 203
TU-2865	REV	752383	754008	1625 MU-1846	753897 gltA		gltA	752408 206
TU-2866	REV	752383	754008	1625 MU-1846	753901 gltA		gltA	752408 210
TU-2867	REV	752383	754008	1625 MU-1846	753904 gltA		gltA	752408 213
TU-2868	REV	752383	754008	1625 MU-1846	753919 gltA		gltA	752408 228
TU-2869	REV	752383	754008	1625 MU-1846	753923 gltA		gltA	752408 232
TU-2870	REV	752383	754008	1625 MU-1846	753995 gltA		gltA	752408 304
TU-2871	REV	752383	754008	1625 MU-1846	754018 gltA		gltA	752408 327
TU-2872	REV	764383	765083	700 MU-1847	765122 mngR		mngR	764376 24
TU-2873	REV	783258	784033	775 MU-1848	784070 zitB		zitB	783105 24
TU-2874	REV	784158	784658	500 MU-1849	784607 ybgS		ybgS	784160 67
TU-2875	REV	784158	784658	500 MU-1849	784663 ybgS		ybgS	784160 123
TU-2876	REV	784158	784658	500 MU-1849	784685 ybgS		ybgS	784160 145
TU-2877	REV	786058	786933	875 MU-1850	786855 gpmA		gpmA	786066 37
TU-2878	REV	786058	786933	875 MU-1850	786893 gpmA		gpmA	786066 75
TU-2879	REV	786058	786933	875 MU-1850	786905 gpmA		gpmA	786066 87
TU-2880	REV	787058	788233	1175 MU-1851	788097 galM		galM	787020 37
TU-2881	REV	787058	788233	1175 MU-1851	788124 galM		galM	787020 64
TU-2882	REV	788258	791283	3025 MU-1852	791309 galK;galT;galE		galE	790262 31
TU-2883	REV	791558	793033	1475 MU-1853	793037 modF		modF	791539 26
TU-2884	REV	791558	793858	2300 MU-1853;MU-1854	793885 modF;modE		modE	793079 18
TU-2885	REV	796858	797658	800 MU-1855	797681 ybhA		ybhA	796836 27
TU-2886	REV	798845	799798	953 MU-1856	ybhD		ybhD	798845
TU-2887	REV	802533	802658	125 MU-1857	NT			
TU-2888	REV	804883	806533	1650 MU-1858	806537 ybhC		ybhC	805221 33
TU-2889	REV	804883	806533	1650 MU-1858	806546 ybhC		ybhC	805221 42
TU-2890	REV	806704	807204	500 MU-1859	807152 ybhB		ybhB	806656 20
TU-2891	REV	806704	808479	1775 MU-1859;MU-1860	808513 ybhB;bioA		bioA	807191 33
TU-2892	REV	812337	812474	137 MU-1861	ybhU		ybhU	812337
TU-2893	REV	814888	815865	977 MU-1862	815894 ybhK		ybhK	814962 24
TU-2894	REV	820940	823715	2775 MU-1863	823747 ybhN;ybhO;ybhP		ybhP	822959 27
TU-2895	REV	824240	828140	3900 MU-1864	828189 ybhR;ybhS;ybhF		ybhF	826468 -15
TU-2896	REV	824240	828140	3900 MU-1864	828206 ybhR;ybhS;ybhF		ybhF	826468 2
TU-2897	REV	824240	829865	5625 MU-1864;MU-1865	829893 ybhR;ybhS;ybhF;ybhG;ybiH		ybiH	829195 27
TU-2898	REV	831290	831940	650 MU-1866	ybiA		ybiA	831691
TU-2899	REV	836696	837171	475 MU-1867	837198 ybiJ		ybiJ	836888 50
TU-2900	REV	837221	837671	450 MU-1868	837699 ybiI		ybiI	837413 20
TU-2901	REV	837221	837671	450 MU-1868	837705 ybiI		ybiI	837413 26
TU-2902	REV	837746	839096	1350 MU-1869	839139 ybiX		ybiX	837753 709
TU-2903	REV	837746	840846	3100 MU-1869;MU-1870	ybiX;fiu		fiu	838472
TU-2904	REV	841021	841296	275 MU-1871	ybiM		ybiM	841019
TU-2905	REV	842522	844697	2175 MU-1872	844733 ybiO		ybiO	842478 30
TU-2906	REV	844822	847397	2575 MU-1873	847270 glnQ;glnP;glnH		glnH	846481 43
TU-2907	REV	844822	847397	2575 MU-1873	847360 glnQ;glnP;glnH		glnH	846481 133
TU-2908	REV	847597	848147	550 MU-1874	848160 dps		dps	847631 26



TU-2909	REV	847597	848147	550 MU-1874	848167 dps	dps	847631	33
TU-2910	REV	847597	848147	550 MU-1874	848173 dps	dps	847631	39
TU-2911	REV	848472	849372	900 MU-1875	849354 rhtA	rhtA	848433	34
TU-2912	REV	850347	851897	1550 MU-1876	ybiP	ybiP	850237	
TU-2913	REV	851972	852247	275 MU-1877	852270 rybA	rybA	852175	7
TU-2914	REV	854097	854997	900 MU-1878	855021 ybiS	ybiS	854047	54
TU-2915	REV	857122	859250	2128 MU-1879	859272 ybiU;ybiV	ybiV	858436	21
TU-2916	REV	859397	862761	3364 MU-1880	ybiW;ybiY	ybiY	861835	
TU-2917	REV	863625	865650	2025 MU-1881	865611 moeB;moeA	moeA	864352	24
TU-2918	REV	875950	877275	1325 MU-1882	877292 yliG	yliG	875933	34
TU-2919	REV	879075	879725	650 MU-1883	879742 yliJ	yliJ	879077	39
TU-2920	REV	881235	882710	1475 MU-1884	882682 deoR;ybjG	ybjG	882015	71
TU-2921	REV	884235	886535	2300 MU-1885	886577 ybjH;ybjI;ybjJ	ybjJ	885354	15
TU-2922	REV	887110	887335	225 MU-1886	887280 rybB	rybB	887199	3
TU-2923	REV	887435	889179	1744 MU-1887	889168 ybjL	ybjL	887357	126
TU-2924	REV	889729	890004	275 MU-1888	889999 grxA	grxA	889719	23
TU-2925	REV	889729	890004	275 MU-1888	890020 grxA	grxA	889719	44
TU-2926	REV	898482	899832	1350 MU-1889	899820 artJ	artJ	899067	22
TU-2927	REV	898482	899832	1350 MU-1889	899828 artJ	artJ	899067	30
TU-2928	REV	898482	899832	1350 MU-1889	899849 artJ	artJ	899067	51
TU-2929	REV	900082	903007	2925 MU-1890	902993 artM;artQ;artI;artP	artP	902229	36
TU-2930	REV	900082	903007	2925 MU-1890	903066 artM;artQ;artI;artP	artP	902229	109
TU-2931	REV	903157	903707	550 MU-1891	903736 ybjP	ybjP	903175	46
TU-2932	REV	904957	906007	1050 MU-1892	906078 ybjS	ybjS	904963	102
TU-2933	REV	906082	908558	2476 MU-1893	908543 ybjT;ltaE	ltaE	907516	26
TU-2934	REV	906082	910283	4201 MU-1893;MU-1894	910299 ybjT;ltaE;poxB	poxB	908554	27
TU-2935	REV	910458	911608	1150 MU-1895	911723 hcr	hcr	910405	350
TU-2936	REV	910458	913037	2579 MU-1895;MU-1896	913299 hcr;hcp	hcp	911385	262
TU-2937	REV	913208	914083	875 MU-1897	914076 ybjE	ybjE	913181	-4
TU-2938	REV	914358	914458	100 MU-1898	914507 NT			
TU-2939	REV	914358	914458	100 MU-1898	914515 NT			
TU-2940	REV	914633	915383	750 MU-1899	915454 aqpZ	aqpZ	914575	184
TU-2941	REV	917033	918308	1275 MU-1900	918326 ybjX	ybjX	917351	-17
TU-2942	REV	921510	921885	375 MU-1901	921858 cspD	cspD	921589	45
TU-2943	REV	921510	921885	375 MU-1901	921899 cspD	cspD	921589	86
TU-2944	REV	925098	925323	225 MU-1902	925194 serW	serW	925107	0
TU-2945	REV	925434	925909	475 MU-1903	925671 infA	infA	925448	5
TU-2946	REV	925434	925909	475 MU-1903	925694 infA	infA	925448	28
TU-2947	REV	925434	925909	475 MU-1903	925701 infA	infA	925448	35
TU-2948	REV	925434	925909	475 MU-1903	925730 infA	infA	925448	64
TU-2949	REV	925959	926809	850 MU-1904	aat	aat	925951	
TU-2950	REV	926834	930234	3400 MU-1905	930221 cydC;cydD	cydD	928419	36
TU-2951	REV	930284	931284	1000 MU-1906	931301 trxB	trxB	930308	28
TU-2952	REV	943934	944809	875 MU-1907	944837 ycaC	ycaC	944154	57
TU-2953	REV	947984	948784	800 MU-1908	948821 ycaN	ycaN	947883	30
TU-2954	REV	949559	950359	800 MU-1909	950378 pflA	pflA	949563	75

TU-2955	REV	950509	952734	2225 MU-1910	952802 pflB	pflB	950495	25
TU-2956	REV	950509	952734	2225 MU-1910	952864 pflB	pflB	950495	87
TU-2957	REV	950509	952734	2225 MU-1910	952967 pflB	pflB	950495	190
TU-2958	REV	952759	953911	1152 MU-1911	953715 focA	focA	952832	26
TU-2959	REV	952759	953911	1152 MU-1911	953726 focA	focA	952832	37
TU-2960	REV	954136	955911	1775 MU-1912	955881 ycaO	ycaO	954095	26
TU-2961	REV	959086	959386	300 MU-1913	959396 NT			
TU-2962	REV	972137	972612	475 MU-1914	972639 ycbC	ycbC	971845	15
TU-2963	REV	983462	984937	1475 MU-1915	984958 aspC	aspC	983742	26
TU-2964	REV	983462	984937	1475 MU-1915	984967 aspC	aspC	983742	35
TU-2965	REV	985088	986313	1225 MU-1916	986315 ompF	ompF	985117	110
TU-2966	REV	986817	988342	1525 MU-1917	988228 asnS	asnS	986808	20
TU-2967	REV	986817	988342	1525 MU-1917	988242 asnS	asnS	986808	34
TU-2968	REV	986817	988342	1525 MU-1917	988267 asnS	asnS	986808	59
TU-2969	REV	988392	989667	1275 MU-1918	989638 pncB	pncB	988377	59
TU-2970	REV	992567	996792	4225 MU-1919	996785 ssuB;ssuC;ssuD;ssuA;ssuE	ssuE	996160	50
TU-2971	REV	1003568	1003668	100 MU-1920	1003714 NT			
TU-2972	REV	1005893	1006818	925 MU-1921	1006847 ycbX	ycbX	1005714	24
TU-2973	REV	1015168	1015768	600 MU-1922	1015720 fabA	fabA	1015175	27
TU-2974	REV	1015793	1017518	1725 MU-1923	1017551 ycbZ	ycbZ	1015762	29
TU-2975	REV	1018243	1019443	1200 MU-1924	1019302 ompA	ompA	1018236	26
TU-2976	REV	1018243	1019443	1200 MU-1924	1019341 ompA	ompA	1018236	65
TU-2977	REV	1018243	1019443	1200 MU-1924	1019418 ompA	ompA	1018236	142
TU-2978	REV	1019468	1020143	675 MU-1925	1020172 sulA	sulA	1019633	30
TU-2979	REV	1020943	1023568	2625 MU-1926	1023560 yccS;yccF	yccF	1023125	-11
TU-2980	REV	1020943	1023568	2625 MU-1926	1023602 yccS;yccF	yccF	1023125	31
TU-2981	REV	1025743	1026243	500 MU-1927	1026264 mgsA	mgsA	1025780	26
TU-2982	REV	1026393	1027018	625 MU-1928	1027059 yccT	yccT	1026334	63
TU-2983	REV	1027636	1027961	325 MU-1929	1027961 hspQ	hspQ	1027627	17
TU-2984	REV	1027636	1027961	325 MU-1929	1027966 hspQ	hspQ	1027627	22
TU-2985	REV	1027986	1029186	1200 MU-1930	1029221 yccW	yccW	1028002	29
TU-2986	REV	1029536	1029887	351 MU-1931	1029908 yccK	yccK	1029562	17
TU-2987	REV	1029536	1029887	351 MU-1931	1029915 yccK	yccK	1029562	24
TU-2988	REV	1029987	1030712	725 MU-1932	1030669 yccA	yccA	1029982	28
TU-2989	REV	1029987	1030712	725 MU-1932	1030673 yccA	yccA	1029982	32
TU-2990	REV	1030837	1030912	75 MU-1933	1030935 serT	serT	1030848	0
TU-2991	REV	1030937	1031412	475 MU-1934	1031352 NT			
TU-2992	REV	1041187	1041812	625 MU-1935	1041752 NT			
TU-2993	REV	1042137	1049212	7075 MU-1936	etk;etp;gfcE;gfcD;gfcC;gfcB;gfcA	gfcA	1048662	
TU-2994	REV	1049312	1049912	600 MU-1937	1049923 NT			
TU-2995	REV	1050186	1050398	212 MU-1938	cspH	cspH	1050186	
TU-2996	REV	1051512	1052585	1073 MU-1939	yccM	yccM	1051512	
TU-2997	REV	1052657	1055401	2744 MU-1940	torS	torS	1052657	
TU-2998	REV	1056337	1057387	1050 MU-1941	1057207 torR	torR	1056485	30
TU-2999	REV	1061837	1063037	1200 MU-1942	1063026 cbpM;cbpA	cbpA	1062078	28
TU-3000	REV	1061837	1063037	1200 MU-1942	1063051 cbpM;cbpA	cbpA	1062078	53

TU-3001	REV	1061837	1063037	1200 MU-1942	1063056 cbpM;cbpA	cbpA	1062078	58
TU-3002	REV	1065987	1067112	1125 MU-1943	1066953 yccJ;wrbA	wrbA	1066335	22
TU-3003	REV	1065987	1067112	1125 MU-1943	1066959 yccJ;wrbA	wrbA	1066335	28
TU-3004	REV	1065987	1067112	1125 MU-1943	1066981 yccJ;wrbA	wrbA	1066335	50
TU-3005	REV	1067437	1068887	1450 MU-1944	1068877 rutG	rutG	1067734	-185
TU-3006	REV	1067437	1073237	5800 MU-1944;MU-1945	1073288 rutG;rutF;rutE;rutD;rutC;rutB;rutA	rutA	1072086	54
TU-3007	REV	1074387	1078137	3750 MU-1946	1078129 putA	putA	1074143	24
TU-3008	REV	1074387	1078137	3750 MU-1946	1078136 putA	putA	1074143	31
TU-3009	REV	1074387	1078137	3750 MU-1946	1078145 putA	putA	1074143	40
TU-3010	REV	1080012	1080587	575 MU-1947	1080499 NT			
TU-3011	REV	1083712	1084062	350 MU-1948	1084079 NT			
TU-3012	REV	1085337	1085662	325 MU-1949	1085851 pgaD	pgaD	1085329	109
TU-3013	REV	1085329	1091512	6183 MU-1950	pgaD;pgaC;pgaB;pgaA	pgaA	1089089	
TU-3014	REV	1093437	1094687	1250 MU-1951	insF;insE	insE	1094361	
TU-3015	REV	1096787	1096887	100 MU-1952	1096875 serX	serX	1096788	0
TU-3016	REV	1100137	1102537	2400 MU-1953	1102550 csgG;csgF;csgE;csgD	csgD	1101769	131
TU-3017	REV	1100137	1102537	2400 MU-1953	1102566 csgG;csgF;csgE;csgD	csgD	1101769	147
TU-3018	REV	1106915	1108215	1300 MU-1954	1108345 mdoC	mdoC	1107007	181
TU-3019	REV	1112815	1113415	600 MU-1955	1113435 msyB	msyB	1113030	31
TU-3020	REV	1113515	1114740	1225 MU-1956	1114756 mdtG	mdtG	1113487	43
TU-3021	REV	1114890	1115840	950 MU-1957	1115838 lpxL	lpxL	1114885	33
TU-3022	REV	1117140	1117890	750 MU-1958	1117768 yceI	yceI	1117124	69
TU-3023	REV	1117140	1117890	750 MU-1958	1117897 yceI	yceI	1117124	198
TU-3024	REV	1117140	1118269	1129 MU-1958;MU-1959	1118294 yceI;yceJ	yceJ	1117703	25
TU-3025	REV	1118530	1118670	140 MU-1960	yceO	yceO	1118530	
TU-3026	REV	1118765	1119865	1100 MU-1961	1119832 solA	solA	1118691	23
TU-3027	REV	1119915	1120240	325 MU-1962	1120252 bssS	bssS	1119924	74
TU-3028	REV	1120472	1120697	225 MU-1963	1120732 dinI	dinI	1120465	22
TU-3029	REV	1120772	1121847	1075 MU-1964	1121857 pyrC	pyrC	1120784	27
TU-3030	REV	1120772	1121847	1075 MU-1964	1121866 pyrC	pyrC	1120784	36
TU-3031	REV	1122022	1123297	1275 MU-1965	1123304 yceB;grxB	grxB	1122630	27
TU-3032	REV	1123341	1124549	1208 MU-1966	mdtH	mdtH	1123341	
TU-3033	REV	1128898	1129398	500 MU-1967	1129388 flgN;flgM	flgM	1129058	37
TU-3034	REV	1128898	1130086	1188 MU-1967;MU-1968	flgN;flgM;flgA	flgA	1129427	
TU-3035	REV	1140403	1144079	3676 MU-1969	1143581 rne	rne	1140405	-9
TU-3036	REV	1140403	1144079	3676 MU-1969	1143607 rne	rne	1140405	17
TU-3037	REV	1140403	1144079	3676 MU-1969	1143903 rne	rne	1140405	313
TU-3038	REV	1140403	1144079	3676 MU-1969	1144100 rne	rne	1140405	510
TU-3039	REV	1145229	1145929	700 MU-1970	1145848 yceF	yceF	1145234	30
TU-3040	REV	1156605	1156855	250 MU-1971	NT			
TU-3041	REV	1158780	1160830	2050 MU-1972	1160838 fhuE	fhuE	1158585	64
TU-3042	REV	1167280	1168055	775 MU-1973	1168006 ycfQ	ycfQ	1167423	-49
TU-3043	REV	1168630	1169530	900 MU-1974	1169641 ycfS	ycfS	1168635	44
TU-3044	REV	1169780	1173205	3425 MU-1975	1173215 mfd	mfd	1169741	28
TU-3045	REV	1169780	1173205	3425 MU-1975	1173251 mfd	mfd	1169741	64
TU-3046	REV	1173315	1174388	1073 MU-1976	ycfT	ycfT	1173315	

TU-3047	REV	1179702	1180490	788 MU-1977	ycfZ	ycfZ	1179702	
TU-3048	REV	1180487	1180948	461 MU-1978	yfmA	yfmA	1180487	
TU-3049	REV	1181012	1184862	3850 MU-1979	1184883 potD;potC;potB;potA	potA	1183681	66
TU-3050	REV	1186362	1187462	1100 MU-1980	1187488 ycfD	ycfD	1186342	25
TU-3051	REV	1187487	1189662	2175 MU-1981	1189695 phoQ;phoP	phoP	1188999	25
TU-3052	REV	1187487	1189662	2175 MU-1981	1189706 phoQ;phoP	phoP	1188999	36
TU-3053	REV	1187487	1189662	2175 MU-1981	1189714 phoQ;phoP	phoP	1188999	44
TU-3054	REV	1189687	1193141	3454 MU-1982	1193024 purB;hflD;mnmA	mnmA	1191890	28
TU-3055	REV	1193216	1194141	925 MU-1983	1194167 nudJ;rluE	rluE	1193521	-7
TU-3056	REV	1196090	1196755	665 MU-1984	1196783 ymfD	yfmD	1196090	28
TU-3057	REV	1196756	1197460	704 MU-1985	1197501 ymfE	yfmE	1196756	41
TU-3058	REV	1199651	1200101	450 MU-1986	1200268 intE;xisE	xisE	1200010	13
TU-3059	REV	1199651	1200101	450 MU-1986	1200279 intE;xisE	xisE	1200010	24
TU-3060	REV	1200501	1200576	75 MU-1987	1200715 NT			
TU-3061	REV	1201051	1202126	1075 MU-1988	1202147 ymfJ;yfmK	yfmK	1201482	-9
TU-3062	REV	1201051	1202126	1075 MU-1988	1202156 ymfJ;yfmK	yfmK	1201482	0
TU-3063	REV	1202276	1202401	125 MU-1989	1202433 NT			
TU-3064	REV	1202951	1203126	175 MU-1990	1203044 NT			
TU-3065	REV	1207768	1207993	225 MU-1991	1208076 NT			
TU-3066	REV	1207740	1208842	1102 MU-1992	tfaE;stfE	stfE	1208342	
TU-3067	REV	1210903	1211226	323 MU-1993	elbA	elbA	1210903	
TU-3068	REV	1211926	1212330	404 MU-1994	1212359 ycgX	ycgX	1211926	29
TU-3069	REV	1212518	1213318	800 MU-1995	1213336 ycgE	ycgE	1212551	54
TU-3070	REV	1213518	1214468	950 MU-1996	1214729 ycgF	ycgF	1213487	31
TU-3071	REV	1221544	1222294	750 MU-1997	1222320 ymgD;ymgG;ymgI	ymgI	1222213	-66
TU-3072	REV	1223419	1225344	1925 MU-1998	1225362 minE;minD;minC	minC	1224608	59
TU-3073	REV	1225519	1225619	100 MU-1999	1225656 NT			
TU-3074	REV	1226119	1226720	601 MU-2000	1226729 ycgK	ycgK	1226294	34
TU-3075	REV	1229220	1229620	400 MU-2001	1229673 hlyE	hlyE	1228706	56
TU-3076	REV	1231720	1232245	525 MU-2002	1232278 dsbB	dsbB	1231723	25
TU-3077	REV	1232420	1233945	1525 MU-2003	1233988 nhaB	nhaB	1232399	48
TU-3078	REV	1234945	1236495	1550 MU-2004	1236509 ycgB	ycgB	1234932	45
TU-3079	REV	1239395	1242320	2925 MU-2005	1242327 cvrA;ldcA	ldcA	1241389	24
TU-3080	REV	1243420	1243870	450 MU-2006	1243778 ycgR	ycgR	1243016	28
TU-3081	REV	1244899	1246624	1725 MU-2007	1246645 treA	treA	1244902	46
TU-3082	REV	1246974	1250174	3200 MU-2008	1250020 dhaM;dhaL;dhaK	dhaK	1248991	-41
TU-3083	REV	1246974	1250174	3200 MU-2008	1250041 dhaM;dhaL;dhaK	dhaK	1248991	-20
TU-3084	REV	1252799	1255374	2575 MU-2009	1255468 ycgV	ycgV	1252308	293
TU-3085	REV	1252799	1255374	2575 MU-2009	1255538 ycgV	ycgV	1252308	363
TU-3086	REV	1255874	1256924	1050 MU-2010	1257105 ychF	ychF	1255944	70
TU-3087	REV	1256949	1257749	800 MU-2011	1257765 pth	pth	1257152	29
TU-3088	REV	1258599	1260049	1450 MU-2012	1260092 ychM	ychM	1258347	66
TU-3089	REV	1260099	1261324	1225 MU-2013	1261082 prs	prs	1260151	-16
TU-3090	REV	1261349	1262724	1375 MU-2014	1262758 ispE;lolB	lolB	1262100	35
TU-3091	REV	1268374	1268474	100 MU-2015	1268557 ldrA	ldrA	1268391	59
TU-3092	REV	1268599	1268699	100 MU-2016	NT			

TU-3093	REV	1268899	1269024	125 MU-2017	ldrB	ldrB	1268926	
TU-3094	REV	1269124	1269224	100 MU-2018	NT			
TU-3095	REV	1269424	1269549	125 MU-2019	ldrC	ldrC	1269461	
TU-3096	REV	1269649	1269749	100 MU-2020	NT			
TU-3097	REV	1269974	1271099	1125 MU-2021	1271119 chaA	chaA	1269972	47
TU-3098	REV	1272499	1272924	425 MU-2022	1272855 ychN	ychN	1272469	33
TU-3099	REV	1274375	1277000	2625 MU-2023	1277086 narL;narX	narX	1275045	245
TU-3100	REV	1286375	1286525	150 MU-2024	1286462 rttR;trp;tyrV	tyrV	1286467	-89
TU-3101	REV	1286550	1286825	275 MU-2025	1286758 tyrT	tyrT	1286761	-87
TU-3102	REV	1286850	1288375	1525 MU-2026	1288373 purU;ychJ	ychJ	1287897	18
TU-3103	REV	1286850	1288375	1525 MU-2026	1288400 purU;ychJ	ychJ	1287897	45
TU-3104	REV	1289125	1289325	200 MU-2027	1289388 NT			
TU-3105	REV	1291725	1292150	425 MU-2028	1292153 hns	hns	1291732	8
TU-3106	REV	1291725	1292150	425 MU-2028	1292181 hns	hns	1291732	36
TU-3107	REV	1293649	1294545	896 MU-2029	insZ	insZ	1293649	
TU-3108	REV	1294475	1297475	3000 MU-2030	1297361 adhE	adhE	1294669	17
TU-3109	REV	1294475	1297475	3000 MU-2030	1297367 adhE	adhE	1294669	23
TU-3110	REV	1294475	1297475	3000 MU-2030	1297374 adhE	adhE	1294669	30
TU-3111	REV	1294475	1297475	3000 MU-2030	1297392 adhE	adhE	1294669	48
TU-3112	REV	1294475	1297475	3000 MU-2030	1297440 adhE	adhE	1294669	96
TU-3113	REV	1294475	1297475	3000 MU-2030	1297477 adhE	adhE	1294669	133
TU-3114	REV	1304851	1306676	1825 MU-2031	1306680 yciU;cls	cls	1305209	11
TU-3115	REV	1304851	1306676	1825 MU-2031	1306697 yciU;cls	cls	1305209	28
TU-3116	REV	1307026	1308526	1500 MU-2032	1308374 kch	kch	1307040	81
TU-3117	REV	1307026	1308526	1500 MU-2032	1308579 kch	kch	1307040	286
TU-3118	REV	1308626	1308901	275 MU-2033	1308916 yciI	yciI	1308593	27
TU-3119	REV	1309876	1310276	400 MU-2034	1310298 yciA	yciA	1309872	28
TU-3120	REV	1310376	1311701	1325 MU-2035	1311720 yciB;yciC	yciC	1310944	33
TU-3121	REV	1312776	1314076	1300 MU-2036	1314116 yciE;yciF;yciG	yciG	1313880	57
TU-3122	REV	1314402	1318177	3775 MU-2037	1317986 trpA;trpB;trpC	trpC	1316451	177
TU-3123	REV	1314402	1318177	3775 MU-2037	1318200 trpA;trpB;trpC	trpC	1316451	391
TU-3124	REV	1314402	1321102	6700 MU-2037;MU-2038	1321132 trpA;trpB;trpC;trpD;trpE;trpL	trpL	1321062	26
TU-3125	REV	1325702	1327227	1525 MU-2039	1327190 btuR;yciK	yciK	1326378	54
TU-3126	REV	1328502	1328752	250 MU-2040	1328711 yciN	yciN	1328441	19
TU-3127	REV	1328502	1328752	250 MU-2040	1328719 yciN	yciN	1328441	27
TU-3128	REV	1328502	1328752	250 MU-2040	1328738 yciN	yciN	1328441	46
TU-3129	REV	1336613	1337188	575 MU-2041	1337214 ribA	ribA	1336594	30
TU-3130	REV	1341038	1341463	425 MU-2042	1341392 osmB	osmB	1341134	40
TU-3131	REV	1341038	1341463	425 MU-2042	1341449 osmB	osmB	1341134	97
TU-3132	REV	1341738	1342388	650 MU-2043	1342411 yciT	yciT	1341621	41
TU-3133	REV	1341738	1342663	925 MU-2043;MU-2044	1342663 yciT;yciZ	yciZ	1342460	30
TU-3134	REV	1342813	1344838	2025 MU-2045	1344866 gmr	gmr	1342781	100
TU-3135	REV	1345013	1347138	2125 MU-2046	1346965 rnb	rnb	1345002	29
TU-3136	REV	1345013	1347138	2125 MU-2046	1347152 rnb	rnb	1345002	216
TU-3137	REV	1347163	1348213	1050 MU-2047	yciW	yciW	1347004	
TU-3138	REV	1348313	1349113	800 MU-2048	1349112 fabI	fabI	1348275	49

TU-3139	REV	1348313	1349113	800 MU-2048	1349118 fabI	fabI	1348275	55
TU-3140	REV	1348313	1349113	800 MU-2048	1349127 fabI	fabI	1348275	64
TU-3141	REV	1348313	1349113	800 MU-2048	1349144 fabI	fabI	1348275	81
TU-3142	REV	1349365	1354140	4775 MU-2049	1354010 ycjD;sapF;sapD;sapC;sapB	sapB	1352529	516
TU-3143	REV	1349365	1354140	4775 MU-2049	1354061 ycjD;sapF;sapD;sapC;sapB	sapB	1352529	567
TU-3144	REV	1349365	1354140	4775 MU-2049	1354111 ycjD;sapF;sapD;sapC;sapB	sapB	1352529	617
TU-3145	REV	1349365	1355365	6000 MU-2049;MU-2050	1355205 ycjD;sapF;sapD;sapC;sapB;sapA	sapA	1353491	71
TU-3146	REV	1349365	1355365	6000 MU-2049;MU-2050	1355443 ycjD;sapF;sapD;sapC;sapB;sapA	sapA	1353491	309
TU-3147	REV	1355390	1355715	325 MU-2051	1355723 ymjA	ymjA	1355447	31
TU-3148	REV	1355815	1358965	3150 MU-2052	1358991 puuP;puuA	puuA	1357514	59
TU-3149	REV	1365290	1365915	625 MU-2053	1365969 pspF	pspF	1364959	33
TU-3150	REV	1381216	1381991	775 MU-2054	1382013 ycjW	ycjW	1380987	28
TU-3151	REV	1386266	1386841	575 MU-2055	1386860 tpx	tpx	1386329	25
TU-3152	REV	1386266	1386841	575 MU-2055	1386868 tpx	tpx	1386329	33
TU-3153	REV	1387791	1388766	975 MU-2056	1388647 mpaA	mpaA	1387894	-35
TU-3154	REV	1389091	1389866	775 MU-2057	1389911 ymjC;ycjY	ycjY	1388957	22
TU-3155	REV	1389091	1389866	775 MU-2057	1389918 ymjC;ycjY	ycjY	1388957	29
TU-3156	REV	1392941	1393966	1025 MU-2058	1393949 ynaI	ynaI	1392915	3
TU-3157	REV	1395691	1396716	1025 MU-2059	1396683 uspE	uspE	1395696	37
TU-3158	REV	1396791	1397666	875 MU-2060	1397563 fnr	fnr	1396798	13
TU-3159	REV	1396791	1397666	875 MU-2060	1397576 fnr	fnr	1396798	26
TU-3160	REV	1397767	1398267	500 MU-2061	1398309 ogt	ogt	1397745	49
TU-3161	REV	1398867	1402592	3725 MU-2062	1402613 abgT;abgB;abgA	abgA	1401279	24
TU-3162	REV	1398867	1402592	3725 MU-2062	1402707 abgT;abgB;abgA	abgA	1401279	118
TU-3163	REV	1403717	1403792	75 MU-2063	1403829 isrA	isrA	1403676	-4
TU-3164	REV	1404392	1405917	1525 MU-2064	1405893 ydaM	ydaM	1404587	74
TU-3165	REV	1407317	1407417	100 MU-2065	1407453 NT			
TU-3166	REV	1408867	1410443	1576 MU-2066	1410148 ttcA	ttcA	1409037	176
TU-3167	REV	1408867	1410443	1576 MU-2066	1410184 ttcA	ttcA	1409037	212
TU-3168	REV	1411468	1415118	3650 MU-2067	1415056 intR;ydaQ;ydaC;lar;recT;recE	recE	1412810	-354
TU-3169	REV	1415512	1415787	275 MU-2068	racC	racC	1415512	
TU-3170	REV	1415862	1416253	391 MU-2069	ydaE;kiIR	kiIR	1416032	
TU-3171	REV	1417180	1417480	300 MU-2070	ydaF;ydaG	ydaG	1417346	
TU-3172	REV	1417743	1418243	500 MU-2071	1418265 racR	racR	1417789	0
TU-3173	REV	1421436	1421686	250 MU-2072	1421757 NT			
TU-3174	REV	1424887	1425012	125 MU-2073	1424997 NT			
TU-3175	REV	1425787	1426762	975 MU-2074	1426777 insH	insH	1425770	27
TU-3176	REV	1431108	1431698	590 MU-2075	pinR	pinR	1431108	
TU-3177	REV	1432163	1432588	425 MU-2076	1432557 ynaE	ynaE	1432015	276
TU-3178	REV	1432982	1433032	50 MU-2077	ttcC	ttcC	1432982	
TU-3179	REV	1433138	1433688	550 MU-2078	1433665 uspF	uspF	1433209	22
TU-3180	REV	1433138	1433688	550 MU-2078	1433735 uspF	uspF	1433209	92
TU-3181	REV	1433784	1434917	1133 MU-2079	ompN	ompN	1433784	
TU-3182	REV	1435288	1438838	3550 MU-2080	1438869 ydbK	ydbK	1435284	61
TU-3183	REV	1439188	1439763	575 MU-2081	1439801 hslJ	hslJ	1439345	34
TU-3184	REV	1439838	1440888	1050 MU-2082	1440902 ldhA	ldhA	1439878	35

TU-3185	REV	1439838	1440888	1050 MU-2082	1440913 ldhA	ldhA	1439878	46
TU-3186	REV	1439838	1440888	1050 MU-2082	1440942 ldhA	ldhA	1439878	75
TU-3187	REV	1440913	1441513	600 MU-2083	1441359 NT			
TU-3188	REV	1444513	1445313	800 MU-2084	1445332 feaR	feaR	1444402	25
TU-3189	REV	1447538	1451563	4025 MU-2085	1451735 tynA;maoC	maoC	1449621	69
TU-3190	REV	1465963	1467338	1375 MU-2086	insD;insC	insC	1466808	
TU-3191	REV	1480297	1480897	600 MU-2087	1480928 azoR	azoR	1480279	44
TU-3192	REV	1487742	1488867	1125 MU-2088	1488776 gapC	gapC	1487737	39
TU-3193	REV	1489467	1489530	63 MU-2089	1489529 rydC	rydC	1489467	-1
TU-3194	REV	1489892	1490217	325 MU-2090	1490241 hokB;mokB	mokB	1489986	88
TU-3195	REV	1489892	1490217	325 MU-2090	1490328 hokB;mokB	mokB	1489986	175
TU-3196	REV	1492092	1493142	1050 MU-2091	1493095 ydcI	ydcI	1492172	0
TU-3197	REV	1492092	1493142	1050 MU-2091	1493140 ydcI	ydcI	1492172	45
TU-3198	REV	1497302	1498502	1200 MU-2092	1498495 ydcK	ydcK	1497493	22
TU-3199	REV	1501167	1501658	491 MU-2093	yncK	yncK	1501167	
TU-3200	REV	1503005	1504382	1377 MU-2094	1504416 ydcO	ydcO	1502929	312
TU-3201	REV	1506382	1507107	725 MU-2095	1507112 yncJ	yncJ	1506858	24
TU-3202	REV	1514950	1515325	375 MU-2096	1515242 yncL	yncL	1515123	24
TU-3203	REV	1514950	1515325	375 MU-2096	1515272 yncL	yncL	1515123	54
TU-3204	REV	1515875	1516875	1000 MU-2097	1516888 ydcZ;yncA	yncA	1516352	18
TU-3205	REV	1515875	1516875	1000 MU-2097	1516897 ydcZ;yncA	yncA	1516352	27
TU-3206	REV	1518900	1521100	2200 MU-2098	1521181 yncD	yncD	1518987	92
TU-3207	REV	1522600	1524000	1400 MU-2099	1524030 ansP	ansP	1522505	26
TU-3208	REV	1531381	1531881	500 MU-2100	1531895 yddH	yddH	1531306	20
TU-3209	REV	1531381	1531881	500 MU-2100	1531900 yddH	yddH	1531306	25
TU-3210	REV	1532906	1533881	975 MU-2101	1533900 yddE	yddE	1532989	18
TU-3211	REV	1534331	1542131	7800 MU-2102	1542127 narV;narW;narY;narZ;narU	narU	1540696	43
TU-3212	REV	1542408	1544052	1644 MU-2103	yddJ;yddK;yddL	yddL	1543774	
TU-3213	REV	1544567	1545192	625 MU-2104	1545227 yddG	yddG	1544312	34
TU-3214	REV	1550067	1550717	650 MU-2105	1550736 yddM	yddM	1550422	30
TU-3215	REV	1550767	1551892	1125 MU-2106	1551862 adhP	adhP	1550852	0
TU-3216	REV	1550767	1551892	1125 MU-2106	1551892 adhP	adhP	1550852	30
TU-3217	REV	1551992	1553742	1750 MU-2107	1553716 maeA	maeA	1551996	23
TU-3218	REV	1551992	1553742	1750 MU-2107	1553726 maeA	maeA	1551996	33
TU-3219	REV	1553842	1554117	275 MU-2108	1554071 sra	sra	1553850	84
TU-3220	REV	1554167	1554342	175 MU-2109	1554479 bdm	bdm	1554089	175
TU-3221	REV	1554917	1561117	6200 MU-2110	1561168 ddpF;ddpD;ddpC;ddpB;ddpA;ddpX	ddpX	1560519	68
TU-3222	REV	1561467	1565292	3825 MU-2111	1565236 dos;yddV	yddV	1563782	72
TU-3223	REV	1561467	1565292	3825 MU-2111	1565318 dos;yddV	yddV	1563782	154
TU-3224	REV	1565467	1566843	1376 MU-2112	1567038 yddW	yddW	1565528	191
TU-3225	REV	1566993	1568710	1717 MU-2113	1568587 gadC	gadC	1566978	74
TU-3226	REV	1566993	1570060	3067 MU-2113;MU-2114	1570097 gadC;gadB	gadB	1568669	28
TU-3227	REV	1570585	1572910	2325 MU-2115	pqqL	pqqL	1570431	
TU-3228	REV	1573271	1577366	4095 MU-2116	yddB;yddA	yddA	1575681	
TU-3229	REV	1577657	1580548	2891 MU-2117	ydeM;ydeN	ydeN	1578866	
TU-3230	REV	1580950	1581983	1033 MU-2118	ydeO;yneN	yneN	1581786	

TU-3231	REV	1582487	1584587	2100 MU-2119	1584688 ydeP	ydeP	1582231	178
TU-3232	REV	1584844	1585758	914 MU-2120	ydeQ	ydeQ	1584844	
TU-3233	REV	1585962	1586737	775 MU-2121	1586568 ydeR;ydeS	ydeS	1586333	-295
TU-3234	REV	1585962	1588012	2050 MU-2121;MU-2122	1588058 ydeR;ydeS;ydeT	ydeT	1586877	-45
TU-3235	REV	1588512	1590487	1975 MU-2123	1590504 yneL;hipA;hipB	hipB	1590200	38
TU-3236	REV	1590787	1596537	5750 MU-2124	1596621 ydeU;ydeK	ydeK	1592133	511
TU-3237	REV	1596812	1599412	2600 MU-2125	1599295 lsrK;lsrR	lsrR	1598312	30
TU-3238	REV	1606137	1607037	900 MU-2126	1607069 yneE	yneE	1606132	23
TU-3239	REV	1606137	1607037	900 MU-2126	1607122 yneE	yneE	1606132	76
TU-3240	REV	1607362	1609887	2525 MU-2127	1610053 uxaB;yneF	yneF	1608931	175
TU-3241	REV	1609962	1611337	1375 MU-2128	1611305 yneG;yneH	yneH	1610349	30
TU-3242	REV	1611412	1612837	1425 MU-2129	1612751 sad	sad	1611339	24
TU-3243	REV	1616312	1616937	625 MU-2130	1616924 marC	marC	1616267	-8
TU-3244	REV	1617937	1619162	1225 MU-2131	1619191 eamA	eamA	1618262	30
TU-3245	REV	1619312	1619662	350 MU-2132	1619702 NT			
TU-3246	REV	1620862	1621887	1025 MU-2133	1621901 ydeH	ydeH	1620984	27
TU-3247	REV	1622012	1622512	500 MU-2134	1622540 ydeI	ydeI	1622129	19
TU-3248	REV	1623212	1625412	2200 MU-2135	1625428 dcp	dcp	1623359	24
TU-3249	REV	1627462	1630137	2675 MU-2136	ydfI;ydfJ	ydfJ	1629026	
TU-3250	REV	1631712	1632262	550 MU-2137	NT			
TU-3251	REV	1632387	1634437	2050 MU-2138	1634425 tfaQ;ydfN;nohA	nohA	1633864	34
TU-3252	REV	1632387	1634437	2050 MU-2138	1634515 tfaQ;ydfN;nohA	nohA	1633864	124
TU-3253	REV	1634799	1635099	300 MU-2139	NT			
TU-3254	REV	1635574	1635861	287 MU-2140	1635851 gnsB	gnsB	1635633	45
TU-3255	REV	1635574	1635861	287 MU-2140	1635870 gnsB	gnsB	1635633	64
TU-3256	REV	1635978	1636133	155 MU-2141	yfnN	yfnN	1635978	
TU-3257	REV	1636479	1636691	212 MU-2142	1636836 cspI	cspI	1636479	145
TU-3258	REV	1637054	1638609	1555 MU-2143	1638778 ydfP;arrQ;ydfR;essQ	essQ	1638394	169
TU-3259	REV	1639337	1639712	375 MU-2144	1639516 cspB	cspB	1639363	-62
TU-3260	REV	1640513	1642226	1713 MU-2145	1642531 quuQ;ydfU	ydfU	1641279	305
TU-3261	REV	1642737	1642887	150 MU-2146	rem	rem	1642675	
TU-3262	REV	1643012	1643890	878 MU-2147	1643925 hokD;relE;relB	relB	1643657	29
TU-3263	REV	1644040	1644215	175 MU-2148	1644207 NT			
TU-3264	REV	1644815	1645115	300 MU-2149	1645143 NT			
TU-3265	REV	1645146	1645874	728 MU-2150	ydfW;ydfX;dicC	dicC	1645644	
TU-3266	REV	1649265	1649565	300 MU-2151	NT			
TU-3267	REV	1650779	1650862	83 MU-2152	ydfJ	ydfJ	1650779	
TU-3268	REV	1650920	1653165	2245 MU-2153	rspB;rspA	rspA	1651951	
TU-3269	REV	1653420	1653670	250 MU-2154	1653729 ynfA	ynfA	1653371	32
TU-3270	REV	1654295	1655470	1175 MU-2155	1655507 ynfC	ynfC	1654771	26
TU-3271	REV	1664395	1665270	875 MU-2156	1665277 ynfK	ynfK	1664548	34
TU-3272	REV	1664395	1665270	875 MU-2156	1665281 ynfK	ynfK	1664548	38
TU-3273	REV	1664395	1665270	875 MU-2156	1665398 ynfK	ynfK	1664548	155
TU-3274	REV	1665420	1666595	1175 MU-2157	1666625 dgsA	dgsA	1665368	37
TU-3275	REV	1666795	1667570	775 MU-2158	1667696 ynfL	ynfL	1666723	80
TU-3276	REV	1666795	1667570	775 MU-2158	1667714 ynfL	ynfL	1666723	98



TU-3277	REV	1668845	1669145	300 MU-2159	1669157 NT			
TU-3278	REV	1669370	1669920	550 MU-2160	1669894 NT			
TU-3279	REV	1670670	1671770	1100 MU-2161	1671802 mdtI;mdtJ	mdtJ	1671160	277
TU-3280	REV	1672745	1676245	3500 MU-2162	1675955 pntB;pntA	pntA	1674395	28
TU-3281	REV	1672745	1676245	3500 MU-2162	1676006 pntB;pntA	pntA	1674395	79
TU-3282	REV	1672745	1676245	3500 MU-2162	1676021 pntB;pntA	pntA	1674395	94
TU-3283	REV	1672745	1676245	3500 MU-2162	1676026 pntB;pntA	pntA	1674395	99
TU-3284	REV	1672745	1676245	3500 MU-2162	1676038 pntB;pntA	pntA	1674395	111
TU-3285	REV	1679395	1680070	675 MU-2163	1680084 ydgC	ydgC	1679719	30
TU-3286	REV	1679395	1680070	675 MU-2163	1680170 ydgC	ydgC	1679719	116
TU-3287	REV	1682695	1682770	75 MU-2164	1682812 NT			
TU-3288	REV	1683045	1684645	1600 MU-2165	fumC	fumC	1683209	
TU-3289	REV	1683045	1686570	3525 MU-2165;MU-2166	1686432 fumC;fumA	fumA	1684755	31
TU-3290	REV	1683045	1686570	3525 MU-2165;MU-2166	1686465 fumC;fumA	fumA	1684755	64
TU-3291	REV	1689670	1694095	4425 MU-2167	1694118 uidC;uidB;uidA	uidA	1692284	23
TU-3292	REV	1694470	1695170	700 MU-2168	1695100 uidR	uidR	1694486	24
TU-3293	REV	1695220	1696121	901 MU-2169	1696092 hdhA	hdhA	1695297	28
TU-3294	REV	1695220	1696121	901 MU-2169	1696124 hdhA	hdhA	1695297	60
TU-3295	REV	1695220	1696121	901 MU-2169	1696131 hdhA	hdhA	1695297	67
TU-3296	REV	1695220	1696121	901 MU-2169	1696146 hdhA	hdhA	1695297	82
TU-3297	REV	1696246	1697271	1025 MU-2170	1697265 malI	malI	1696176	61
TU-3298	REV	1701246	1702346	1100 MU-2171	1702355 ydgJ	ydgJ	1701292	23
TU-3299	REV	1710271	1710796	525 MU-2172	1710806 NT			
TU-3300	REV	1713096	1713921	825 MU-2173	1713968 pdxY	pdxY	1713050	55
TU-3301	REV	1713096	1713921	825 MU-2173	1713997 pdxY	pdxY	1713050	84
TU-3302	REV	1713096	1715296	2200 MU-2173;MU-2174	1715311 pdxY;tyrS	tyrS	1713972	65
TU-3303	REV	1713096	1716046	2950 MU-2173;MU-2174;MU-2175	1716058 pdxY;tyrS;pdxH	pdxH	1715375	27
TU-3304	REV	1716146	1716371	225 MU-2176	ydhA	ydhA	1716090	
TU-3305	REV	1716721	1717696	975 MU-2177	1717654 anmK	anmK	1716517	28
TU-3306	REV	1716721	1717696	975 MU-2177	1717806 anmK	anmK	1716517	180
TU-3307	REV	1718421	1718971	550 MU-2178	1718877 slyA	slyA	1718414	29
TU-3308	REV	1718421	1718971	550 MU-2178	1718884 slyA	slyA	1718414	36
TU-3309	REV	1718421	1718971	550 MU-2178	1718894 slyA	slyA	1718414	46
TU-3310	REV	1720521	1721096	575 MU-2179	1721100 NT			
TU-3311	REV	1720521	1721096	575 MU-2179	1721114 NT			
TU-3312	REV	1721871	1722696	825 MU-2180	1722703 sodC	sodC	1722158	24
TU-3313	REV	1722721	1723721	1000 MU-2181	1723679 ydhF	ydhF	1722760	23
TU-3314	REV	1723796	1724021	225 MU-2182	1723969 ydhL	ydhL	1723705	25
TU-3315	REV	1731765	1732315	550 MU-2183	1732142 grxD	grxD	1731778	17
TU-3316	REV	1731765	1732315	550 MU-2183	1732160 grxD	grxD	1731778	35
TU-3317	REV	1731765	1732315	550 MU-2183	1732184 grxD	grxD	1731778	59
TU-3318	REV	1731765	1732315	550 MU-2183	1732213 grxD	grxD	1731778	88
TU-3319	REV	1731765	1732315	550 MU-2183	1732257 grxD	grxD	1731778	132
TU-3320	REV	1731765	1732315	550 MU-2183	1732284 grxD	grxD	1731778	159
TU-3321	REV	1734490	1735315	825 MU-2184	1735360 ydhP	ydhP	1734145	46
TU-3322	REV	1735490	1735615	125 MU-2185	1735601 ynhF	ynhF	1735480	32

TU-3323	REV	1735490	1735615	125 MU-2185	1735607 ynhF	ynhF	1735480	38
TU-3324	REV	1735490	1735615	125 MU-2185	1735639 ynhF	ynhF	1735480	70
TU-3325	REV	1736815	1737890	1075 MU-2186	1737837 ydhB	ydhB	1736890	15
TU-3326	REV	1736815	1737890	1075 MU-2186	1737851 ydhB	ydhB	1736890	29
TU-3327	REV	1740615	1741440	825 MU-2187	1741299 ribC	ribC	1740625	33
TU-3328	REV	1742490	1744390	1900 MU-2188	1744226 ydhQ	ydhQ	1742895	75
TU-3329	REV	1747540	1752615	5075 MU-2189	1752725 ydhT; ydhU; ydhX; ydhW; ydhV; ydhY	ydhY	1751875	224
TU-3330	REV	1752990	1753165	175 MU-2190	1753189 ydhZ	ydhZ	1752956	24
TU-3331	REV	1755065	1755390	325 MU-2191	1755409 NT			
TU-3332	REV	1755740	1756865	1125 MU-2192	1756883 ynhG	ynhG	1755745	134
TU-3333	REV	1756965	1762495	5530 MU-2193	1762442 sufE; sufS; sufD; sufC; sufB; sufA	sufB	1760546	409
TU-3334	REV	1756965	1762495	5530 MU-2193	1762523 sufE; sufS; sufD; sufC; sufB; sufA	sufB	1760546	490
TU-3335	REV	1762745	1762920	175 MU-2194	rydB	rydB	1762737	
TU-3336	REV	1762945	1763195	250 MU-2195	1763170 ydiH	ydiH	1762958	-57
TU-3337	REV	1763245	1766920	3675 MU-2196	1766940 ydiI; ydiJ	ydiJ	1763653	231
TU-3338	REV	1776220	1777370	1150 MU-2197	1777365 ydiP	ydiP	1776414	40
TU-3339	REV	1782772	1785147	2375 MU-2198	1785185 pps	pps	1782758	49
TU-3340	REV	1787272	1789247	1975 MU-2199	1789278 ydiU	ydiU	1787832	10
TU-3341	REV	1789422	1790172	750 MU-2200	1790123 ydiV	ydiV	1789331	79
TU-3342	REV	1789422	1790172	750 MU-2200	1790180 ydiV	ydiV	1789331	136
TU-3343	REV	1789422	1790172	750 MU-2200	1790215 ydiV	ydiV	1789331	171
TU-3344	REV	1790272	1790822	550 MU-2201	1790784 nlpC	nlpC	1790291	29
TU-3345	REV	1790847	1792272	1425 MU-2202	1792219 btuD; btuC	btuE	1791582	86
TU-3346	REV	1792297	1793172	875 MU-2203	1793201 btuC	btuC	1792196	25
TU-3347	REV	1793272	1793672	400 MU-2204	1793744 ihfA	ihfA	1793277	168
TU-3348	REV	1793272	1793672	400 MU-2204	1793791 ihfA	ihfA	1793277	215
TU-3349	REV	1793697	1797272	3575 MU-2205	1797159 pheT; pheS; pheM	pheM	1797250	-135
TU-3350	REV	1793697	1797272	3575 MU-2205	1797217 pheT; pheS; pheM	pheM	1797250	-77
TU-3351	REV	1793697	1797272	3575 MU-2205	1797274 pheT; pheS; pheM	pheM	1797250	-20
TU-3352	REV	1793697	1797272	3575 MU-2205	1797327 pheT; pheS; pheM	pheM	1797250	33
TU-3353	REV	1797347	1797772	425 MU-2206	1797807 rplT	rplT	1797417	34
TU-3354	REV	1797347	1798072	725 MU-2206; MU-2207	1798126 rplT; rpmI	rpmI	1797826	103
TU-3355	REV	1797347	1798072	725 MU-2206; MU-2207	1798135 rplT; rpmI	rpmI	1797826	112
TU-3356	REV	1797347	1798072	725 MU-2206; MU-2207	1798300 rplT; rpmI	rpmI	1797826	277
TU-3357	REV	1797347	1798072	725 MU-2206; MU-2207	1798314 rplT; rpmI	rpmI	1797826	291
TU-3358	REV	1797347	1798072	725 MU-2206; MU-2207	1798355 rplT; rpmI	rpmI	1797826	332
TU-3359	REV	1797347	1798072	725 MU-2206; MU-2207	1798394 rplT; rpmI	rpmI	1797826	371
TU-3360	REV	1797347	1798697	1350 MU-2206; MU-2207; MU-2208	1798841 rplT; rpmI; infC	infC	1798120	179
TU-3361	REV	1798097	1800797	2700 MU-2208; MU-2209	1800756 infC; thrS	thrS	1798666	162
TU-3362	REV	1803397	1804172	775 MU-2210	1804192 ydiY	ydiY	1803349	85
TU-3363	REV	1806422	1807347	925 MU-2211	1807286 yniB	yniB	1806721	29
TU-3364	REV	1806422	1807347	925 MU-2211	1807374 yniB	yniB	1806721	117
TU-3365	REV	1810353	1811168	815 MU-2212	ydjO	ydjO	1810353	
TU-3366	REV	1811554	1811679	125 MU-2213	1811716 cedA	cedA	1811445	29
TU-3367	REV	1814179	1815354	1175 MU-2214	1815394 chbG	chbG	1814410	235
TU-3368	REV	1814179	1819735	5556 MU-2214; MU-2215	1819667 chbG; chbF; chbR; chbA; chbC; chbB	chbB	1819323	24

TU-3369	REV	1814179	1819735	5556 MU-2214;MU-2215	1819750 chbG;chbF;chbR;chbA;chbC;chbB	chbB	1819323	107
TU-3370	REV	1819910	1820285	375 MU-2216	1820301 osmE	osmE	1819942	21
TU-3371	REV	1819910	1820285	375 MU-2216	1820307 osmE	osmE	1819942	27
TU-3372	REV	1822535	1822960	425 MU-2217	1823147 ves	ves	1822386	186
TU-3373	REV	1823110	1823735	625 MU-2218	1823713 spy	spy	1823164	64
TU-3374	REV	1823110	1823735	625 MU-2218	1823756 spy	spy	1823164	107
TU-3375	REV	1824085	1830010	5925 MU-2219	1830028 astE;astB;astD;astA;astC	astC	1828786	22
TU-3376	REV	1831185	1832185	1000 MU-2220	1832126 NT			
TU-3377	REV	1838860	1839435	575 MU-2221	1839469 ynjF	ynjF	1838807	42
TU-3378	REV	1839860	1840210	350 MU-2222	1840186 ynjH	ynjH	1839887	27
TU-3379	REV	1841910	1841960	50 MU-2223	1842041 NT			
TU-3380	REV	1841855	1842895	1040 MU-2224	ynjI	ynjI	1841855	
TU-3381	REV	1843035	1846235	3200 MU-2225	1846054 topB;selD	selD	1844989	22
TU-3382	REV	1843035	1846710	3675 MU-2225;MU-2226	1846726 topB;selD;ydjA	ydjA	1846149	26
TU-3383	REV	1850645	1852003	1358 MU-2227	ydjE	ydjE	1850645	
TU-3384	REV	1852260	1852885	625 MU-2228	1852910 ydjF	ydjF	1852120	32
TU-3385	REV	1853015	1859356	6341 MU-2229	ydjG;ydjH;ydjI;ydjJ;ydjK;ydjL	ydjL	1858280	
TU-3386	REV	1859660	1860460	800 MU-2230	1860488 yeaC;msrB	msrB	1860040	35
TU-3387	REV	1862810	1863685	875 MU-2231	1863677 yeaE	yeaE	1862806	17
TU-3388	REV	1863735	1864643	908 MU-2232	1864528 mipA	mipA	1863750	32
TU-3389	REV	1872102	1872206	104 MU-2233	yoaI	yoaI	1872102	
TU-3390	REV	1872793	1873593	800 MU-2234	1873622 yeaM	yeaM	1872779	22
TU-3391	REV	1872793	1873593	800 MU-2234	1873636 yeaM	yeaM	1872779	36
TU-3392	REV	1875193	1875543	350 MU-2235	1875579 yoaF	yoaF	1875302	23
TU-3393	REV	1875193	1875543	350 MU-2235	1875669 yoaF	yoaF	1875302	113
TU-3394	REV	1876893	1877293	400 MU-2236	1877294 yeaQ	yeaQ	1877031	15
TU-3395	REV	1876893	1877293	400 MU-2236	1877321 yeaQ	yeaQ	1877031	42
TU-3396	REV	1877343	1877643	300 MU-2237	yoaG;yeaR	yeaR	1877613	
TU-3397	REV	1878168	1878793	625 MU-2238	leuE	leuE	1878145	
TU-3398	REV	1878968	1879843	875 MU-2239	1879872 yeaT	yeaT	1878910	39
TU-3399	REV	1884968	1886018	1050 MU-2240	1886087 rnd	rnd	1884888	72
TU-3400	REV	1886041	1886126	85 MU-2241	1886158 sroD	sroD	1886041	32
TU-3401	REV	1886068	1887918	1850 MU-2242	1887831 fadD	fadD	1886085	61
TU-3402	REV	1888043	1888568	525 MU-2243	yeaY	yeaY	1887975	
TU-3403	REV	1888043	1889293	1250 MU-2243;MU-2244	1889319 yeaY;yeaZ	yeaZ	1888596	28
TU-3404	REV	1888043	1891243	3200 MU-2243;MU-2244;MU-2245	1891279 yeaY;yeaZ;yoaA	yoaA	1889349	20
TU-3405	REV	1892493	1892843	350 MU-2246	1892777 yoaH	yoaH	1892576	22
TU-3406	REV	1892893	1893520	627 MU-2247	1893573 NT			
TU-3407	REV	1896370	1896470	100 MU-2248	1896478 NT			
TU-3408	REV	1898070	1899770	1700 MU-2249	1899796 yoaE	yoaE	1898053	187
TU-3409	REV	1904370	1905145	775 MU-2250	1905108 rrmA	rrmA	1904275	24
TU-3410	REV	1905195	1905795	600 MU-2251	1905623 cspC;yobF	yobF	1905472	8
TU-3411	REV	1905195	1905795	600 MU-2251	1905642 cspC;yobF	yobF	1905472	27
TU-3412	REV	1906195	1906795	600 MU-2252	1906816 yebO;mgrB	mgrB	1906647	26
TU-3413	REV	1907070	1908245	1175 MU-2253	1908154 kdgR	kdgR	1907332	31
TU-3414	REV	1907070	1908245	1175 MU-2253	1908162 kdgR	kdgR	1907332	39

TU-3415	REV	1909720	1910745	1025 MU-2254	1910628 htpX	htpX	1909719	28
TU-3416	REV	1909720	1910745	1025 MU-2254	1910642 htpX	htpX	1909719	42
TU-3417	REV	1910795	1913720	2925 MU-2255	1913679 prc;proQ	proQ	1912860	121
TU-3418	REV	1910795	1914170	3375 MU-2255;MU-2256	1914138 prc;proQ;yebR	yebR	1913655	-14
TU-3419	REV	1910795	1914170	3375 MU-2255;MU-2256	1914188 prc;proQ;yebR	yebR	1913655	36
TU-3420	REV	1920121	1921046	925 MU-2257	pphA	pphA	1920337	
TU-3421	REV	1921121	1921246	125 MU-2258	ryeB	ryeB	1921188	
TU-3422	REV	1921421	1922996	1575 MU-2259	1923017 yebY;yebZ;yobA	yobA	1922619	24
TU-3423	REV	1923046	1923321	275 MU-2260	1923331 NT			
TU-3424	REV	1924971	1926921	1950 MU-2261	1926889 ptrB	ptrB	1924803	26
TU-3425	REV	1927096	1927721	625 MU-2262	1927758 yebE	yebE	1927072	27
TU-3426	REV	1927846	1928421	575 MU-2263	1928440 yebF	yebF	1928058	26
TU-3427	REV	1927846	1928771	925 MU-2263;MU-2264	1928790 yebF;yebG	yebG	1928481	19
TU-3428	REV	1930146	1931121	975 MU-2265	1930807 eda	eda	1930139	27
TU-3429	REV	1930146	1931121	975 MU-2265	1930823 eda	eda	1930139	43
TU-3430	REV	1930146	1931121	975 MU-2265	1931066 eda	eda	1930139	286
TU-3431	REV	1931171	1932671	1500 MU-2266	1932737 edd	edd	1930817	109
TU-3432	REV	1932896	1934499	1603 MU-2267	1934383 zwf	zwf	1932863	45
TU-3433	REV	1932896	1934499	1603 MU-2267	1934391 zwf	zwf	1932863	53
TU-3434	REV	1932896	1934499	1603 MU-2267	1934398 zwf	zwf	1932863	60
TU-3435	REV	1932896	1934499	1603 MU-2267	1934491 zwf	zwf	1932863	153
TU-3436	REV	1937274	1938249	975 MU-2268	1938245 lpxM	lpxM	1937246	28
TU-3437	REV	1937274	1938249	975 MU-2268	1938252 lpxM	lpxM	1937246	35
TU-3438	REV	1938349	1940624	2275 MU-2269	1940621 yebA;znuA	znuA	1939675	14
TU-3439	REV	1938349	1940624	2275 MU-2269	1940637 yebA;znuA	znuA	1939675	30
TU-3440	REV	1942374	1944099	1725 MU-2270	1944032 ruvB;ruvA	ruvA	1943389	32
TU-3441	REV	1942374	1944099	1725 MU-2270	1944149 ruvB;ruvA	ruvA	1943389	149
TU-3442	REV	1944724	1945274	550 MU-2271	ruvC	ruvC	1944879	
TU-3443	REV	1945324	1948824	3500 MU-2272	1948641 yebC;nudB;aspS	aspS	1946774	95
TU-3444	REV	1952624	1955399	2775 MU-2273	torZ;torY	torY	1955056	
TU-3445	REV	1956499	1957924	1425 MU-2274	1957896 cutC;yecM	yecM	1957304	26
TU-3446	REV	1961274	1970699	9425 MU-2275	1970739 flhE;flhA;flhB;cheZ;cheY;cheB;cheR;tap;tar	tar	1969054	24
TU-3447	REV	1972574	1975149	2575 MU-2276	1975324 cheW;cheA;motB;motA	motA	1974276	161
TU-3448	REV	1975224	1976474	1250 MU-2277	1976303 flhC;flhD	flhD	1975871	82
TU-3449	REV	1975224	1976474	1250 MU-2277	1976309 flhC;flhD	flhD	1975871	88
TU-3450	REV	1976549	1977274	725 MU-2278	insB;insA	insA	1976964	
TU-3451	REV	1978049	1979699	1650 MU-2279	1979674 otsA	otsA	1978212	38
TU-3452	REV	1978049	1980449	2400 MU-2279;MU-2280	1980464 otsA;otsB	otsB	1979611	53
TU-3453	REV	1980549	1982049	1500 MU-2281	araH	araH	1980578	
TU-3454	REV	1980549	1984202	3653 MU-2281;MU-2282	araH;araG;araF	araF	1983163	
TU-3455	REV	1985552	1985852	300 MU-2283	1985809 yecJ	yecJ	1985531	27
TU-3456	REV	1985902	1986027	125 MU-2284	1986026 isrB	isrB	1985863	4
TU-3457	REV	1987277	1987502	225 MU-2285	1987525 yecH	yecH	1987275	11
TU-3458	REV	1988727	1989752	1025 MU-2286	1989673 yecA	yecA	1988978	30
TU-3459	REV	1989802	1990077	275 MU-2287	1990141 leuZ;cysT;glyW	glyW	1990066	0
TU-3460	REV	1990102	1990852	750 MU-2288	1990874 pgsA	pgsA	1990293	33

TU-3461	REV	1990977	1993403	2426 MU-2289	1993427 uvrC;uvrY	uvrY	1992727	44
TU-3462	REV	1990977	1993403	2426 MU-2289	1993595 uvrC;uvrY	uvrY	1992727	212
TU-3463	REV	1994180	1994855	675 MU-2290	1994917 sdiA	sdiA	1994134	61
TU-3464	REV	1994180	1994855	675 MU-2290	1994934 sdiA	sdiA	1994134	78
TU-3465	REV	1995105	1996530	1425 MU-2291	1996664 yecC;yecS	yecS	1995835	161
TU-3466	REV	1995105	1997555	2450 MU-2291;MU-2292	1997532 yecC;yecS;dcyD	dcyD	1996518	28
TU-3467	REV	1997580	1998580	1000 MU-2293	1998422 fliY	fliY	1997609	13
TU-3468	REV	1997580	1998580	1000 MU-2293	1998434 fliY	fliY	1997609	25
TU-3469	REV	1997580	1998580	1000 MU-2293	1998492 fliY	fliY	1997609	83
TU-3470	REV	1998855	1999805	950 MU-2294	1999843 fliZ;fliA	fliA	1999094	30
TU-3471	REV	1999963	2001688	1725 MU-2295	2001653 fliC	fliC	2000134	23
TU-3472	REV	1999963	2001688	1725 MU-2295	2001699 fliC	fliC	2000134	69
TU-3473	REV	2005698	2006198	500 MU-2296	2006138 yedD	yedD	2005701	24
TU-3474	REV	2009247	2010375	1128 MU-2297	yedN	yedN	2009247	
TU-3475	REV	2010724	2011038	314 MU-2298	fliE	fliE	2010724	
TU-3476	REV	2022677	2023002	325 MU-2299	2022868 dsrB	dsrB	2022659	21
TU-3477	REV	2023277	2023377	100 MU-2300	dsrA	dsrA	2023251	
TU-3478	REV	2024277	2026152	1875 MU-2301	2026237 yedQ	yedQ	2024347	196
TU-3479	REV	2026202	2027377	1175 MU-2302	2027413 yodC;yedI	yedI	2026473	23
TU-3480	REV	2028377	2030327	1950 MU-2303	2030365 vsr;dcM	dcM	2028923	24
TU-3481	REV	2030377	2031452	1075 MU-2304	2031465 yedJ;yedR	yedR	2031143	-43
TU-3482	REV	2030377	2031452	1075 MU-2304	2031494 yedJ;yedR	yedR	2031143	-14
TU-3483	REV	2034852	2036802	1950 MU-2305	2036840 yedV;yedW	yedW	2036176	-7
TU-3484	REV	2038577	2039327	750 MU-2306	2039280 NT			
TU-3485	REV	2041462	2041564	102 MU-2307	2041581 serU	serU	2041492	0
TU-3486	REV	2050339	2051589	1250 MU-2308	2051659 yeeL	yeeL	2050300	307
TU-3487	REV	2056055	2056105	50 MU-2309	2056126 asnW	asnW	2056051	0
TU-3488	REV	2056305	2057859	1554 MU-2310	2057871 yeeO	yeeO	2056227	1
TU-3489	REV	2057984	2058984	1000 MU-2311	2058964 cbl	cbl	2057988	26
TU-3490	REV	2057984	2060009	2025 MU-2311;MU-2312	2060074 cbl;nac	nac	2059040	117
TU-3491	REV	2060409	2061359	950 MU-2313	2061377 erfK	erfK	2060415	30
TU-3492	REV	2061409	2063984	2575 MU-2314	2064019 cobT;cobS;cobU	cobU	2063243	231
TU-3493	REV	2061409	2063984	2575 MU-2314	2064031 cobT;cobS;cobU	cobU	2063243	243
TU-3494	REV	2064109	2064109	0 MU-2315	yeeH	yeeH	2064092	
TU-3495	REV	2064209	2065459	1250 MU-2316	2065503 insH	insH	2064329	158
TU-3496	REV	2065509	2066484	975 MU-2317	2066314 yoeG;yoeH	yoeH	2066285	-129
TU-3497	REV	2065509	2066484	975 MU-2317	2066507 yoeG;yoeH	yoeH	2066285	64
TU-3498	REV	2066759	2068209	1450 MU-2318	2068377 insD;insC	insC	2067839	173
TU-3499	REV	2072411	2072736	325 MU-2319	2072764 NT			
TU-3500	REV	2075861	2075986	125 MU-2320	2076010 NT			
TU-3501	REV	2076573	2076701	128 MU-2321	yoeD	yoeD	2076573	
TU-3502	REV	2077061	2077586	525 MU-2322	2077410 yeeX	yeeX	2077056	25
TU-3503	REV	2077061	2077586	525 MU-2322	2077416 yeeX	yeeX	2077056	31
TU-3504	REV	2077061	2077586	525 MU-2322	2077428 yeeX	yeeX	2077056	43
TU-3505	REV	2077061	2077586	525 MU-2322	2077440 yeeX	yeeX	2077056	55
TU-3506	REV	2077061	2077586	525 MU-2322	2077492 yeeX	yeeX	2077056	107

TU-3507	REV	2077061	2077586	525 MU-2322	2077541 yeeX	yeeX	2077056	156
TU-3508	REV	2077611	2079336	1725 MU-2323	2079301 yeeA;sbmC	sbmC	2078813	15
TU-3509	REV	2077611	2079336	1725 MU-2323	2079343 yeeA;sbmC	sbmC	2078813	57
TU-3510	REV	2077611	2079336	1725 MU-2323	2079350 yeeA;sbmC	sbmC	2078813	64
TU-3511	REV	2079411	2080286	875 MU-2324	dacD	dacD	2079405	
TU-3512	REV	2082261	2083536	1275 MU-2325	2083525 yeeD;yeeE	yeeE	2082491	-24
TU-3513	REV	2082261	2083536	1275 MU-2325	2083552 yeeD;yeeE	yeeE	2082491	3
TU-3514	REV	2082261	2083536	1275 MU-2325	2083576 yeeD;yeeE	yeeE	2082491	27
TU-3515	REV	2083736	2085286	1550 MU-2326	2085346 yeeF	yeeF	2083728	260
TU-3516	REV	2085311	2087186	1875 MU-2327	2087176 yeeY;yeeZ	yeeZ	2086328	24
TU-3517	REV	2087236	2087861	625 MU-2328	2087755 yoeB;yefM	yefM	2087486	18
TU-3518	REV	2095236	2096397	1161 MU-2329	2096336 cld	cld	2095345	11
TU-3519	REV	2095236	2096397	1161 MU-2329	2096346 cld	cld	2095345	21
TU-3520	REV	2095236	2096397	1161 MU-2329	2096355 cld	cld	2095345	30
TU-3521	REV	2096497	2097722	1225 MU-2330	2097696 ugd	ugd	2096471	59
TU-3522	REV	2097872	2099272	1400 MU-2331	2099348 gnd	gnd	2097886	56
TU-3523	REV	2097872	2099272	1400 MU-2331	2099381 gnd	gnd	2097886	89
TU-3524	REV	2099297	2099722	425 MU-2332	wbbL	wbbL	2099420	
TU-3525	REV	2099772	2100822	1050 MU-2333	2100996 insH	insH	2099919	61
TU-3526	REV	2099772	2100822	1050 MU-2333	2101009 insH	insH	2099919	74
TU-3527	REV	2100847	2103222	2375 MU-2334	2103361 wbbL;wbbK;wbbJ	wbbJ	2102518	253
TU-3528	REV	2100847	2106408	5561 MU-2334;MU-2335	2106453 wbbL;wbbK;wbbJ;wbbI;rfc;glf	glf	2105250	100
TU-3529	REV	2100847	2106408	5561 MU-2334;MU-2335	2106482 wbbL;wbbK;wbbJ;wbbI;rfc;glf	glf	2105250	129
TU-3530	REV	2100847	2106408	5561 MU-2334;MU-2335	2106493 wbbL;wbbK;wbbJ;wbbI;rfc;glf	glf	2105250	140
TU-3531	REV	2100847	2106408	5561 MU-2334;MU-2335	2106518 wbbL;wbbK;wbbJ;wbbI;rfc;glf	glf	2105250	165
TU-3532	REV	2100847	2107883	7036 MU-2334;MU-2335;MU-2336	2107775 wbbL;wbbK;wbbJ;wbbI;rfc;glf;rfbX	rfbX	2106361	167
TU-3533	REV	2100847	2107883	7036 MU-2334;MU-2335;MU-2336	2107921 wbbL;wbbK;wbbJ;wbbI;rfc;glf;rfbX	rfbX	2106361	313
TU-3534	REV	2100847	2107883	7036 MU-2334;MU-2335;MU-2336	2107951 wbbL;wbbK;wbbJ;wbbI;rfc;glf;rfbX	rfbX	2106361	343
TU-3535	REV	2100847	2109260	8413 MU-2334;MU-2335;MU-2336;MU-2337	2109097 wbbL;wbbK;wbbJ;wbbI;rfc;glf;rfbX;rfbC;rfbA	rfbA	2108162	54
TU-3536	REV	2100847	2109260	8413 MU-2334;MU-2335;MU-2336;MU-2337	2109105 wbbL;wbbK;wbbJ;wbbI;rfc;glf;rfbX;rfbC;rfbA	rfbA	2108162	62
TU-3537	REV	2100847	2109260	8413 MU-2334;MU-2335;MU-2336;MU-2337	2109125 wbbL;wbbK;wbbJ;wbbI;rfc;glf;rfbX;rfbC;rfbA	rfbA	2108162	82
TU-3538	REV	2100847	2111360	10513 MU-2334;MU-2335;MU-2336;MU-2337;MU-2338	2111256 wbbL;wbbK;wbbJ;wbbI;rfc;glf;rfbX;rfbC;rfbA;rfbD;rfbB	rfbB	2110000	171
TU-3539	REV	2111410	2112610	1200 MU-2339	2112375 galF	galF	2111458	24
TU-3540	REV	2111410	2112610	1200 MU-2339	2112440 galF	galF	2111458	89
TU-3541	REV	2112526	2116428	3902 MU-2340	wcaM;wcaL;wcaK	wcaK	2115148	
TU-3542	REV	2116704	2135267	18563 MU-2341	wzxC;wcaJ;cpsG;cpsB;wcaI;gmm;fcl;gmd;wcaF;wcaE;wcaD;wcaC;wcaB;wcaA;wzc;wzb;wza	wza	2134128	
TU-3543	REV	2137791	2140266	2475 MU-2342	2140303 asmA;dcd	dcd	2139658	64
TU-3544	REV	2140291	2140991	700 MU-2343	2141004 udk	udk	2140331	32
TU-3545	REV	2140291	2140991	700 MU-2343	2141028 udk	udk	2140331	56
TU-3546	REV	2144716	2145666	950 MU-2344	2145583 alka	alka	2144716	19

TU-3547	REV	2147166	2148916	1750 MU-2345	2149011 yegI	yegI	2147063	2
TU-3548	REV	2147166	2148916	1750 MU-2345	2149067 yegI	yegI	2147063	58
TU-3549	REV	2149735	2151152	1417 MU-2346	yegK;yegL	yegL	2150493	
TU-3550	REV	2165341	2165541	200 MU-2347	2165572 ogrK	ogrK	2165326	28
TU-3551	REV	2165626	2166330	704 MU-2348	yegZ;yegR	yegR	2166013	
TU-3552	REV	2167441	2168341	900 MU-2349	gatR	gatR	2167717	
TU-3553	REV	2169016	2169691	675 MU-2350	2169773 gatR	gatR	2169453	22
TU-3554	REV	2169716	2175241	5525 MU-2351	2175234 gatD;gatC;gatB;gatA;gatZ;gatY	gatY	2174372	8
TU-3555	REV	2169716	2175241	5525 MU-2351	2175250 gatD;gatC;gatB;gatA;gatZ;gatY	gatY	2174372	24
TU-3556	REV	2169716	2175241	5525 MU-2351	2175256 gatD;gatC;gatB;gatA;gatZ;gatY	gatY	2174372	30
TU-3557	REV	2175391	2176641	1250 MU-2352	2176631 fbaB	fbaB	2175534	45
TU-3558	REV	2175391	2176641	1250 MU-2352	2176655 fbaB	fbaB	2175534	69
TU-3559	REV	2179991	2181016	1025 MU-2353	2180828 yegW	yegW	2180057	25
TU-3560	REV	2181116	2183591	2475 MU-2354	2183456 yegX;thiD;thiM	thiM	2182535	133
TU-3561	REV	2181116	2183591	2475 MU-2354	2183473 yegX;thiD;thiM	thiM	2182535	150
TU-3562	REV	2183641	2183816	175 MU-2355	2183843 rcnR	rcnR	2183546	25
TU-3563	REV	2185416	2190216	4800 MU-2356	2190296 yehA;yehB;yehC;yehD	yehD	2189702	52
TU-3564	REV	2190516	2190866	350 MU-2357	2190865 yehE	yehE	2190537	47
TU-3565	REV	2191116	2192191	1075 MU-2358	2192222 mrp	mrp	2191081	32
TU-3566	REV	2208866	2209191	325 MU-2359	2209224 NT			
TU-3567	REV	2209866	2210291	425 MU-2360	2210248 yehS	yehS	2209748	30
TU-3568	REV	2210366	2212643	2277 MU-2361	2212693 yehT;yehU	yehU	2210981	27
TU-3569	REV	2213718	2217668	3950 MU-2362	2217545 yehW;yehX;yehY;osmF	osmF	2216586	42
TU-3570	REV	2217718	2220043	2325 MU-2363	2220064 bglX	bglX	2217714	53
TU-3571	REV	2221843	2222993	1150 MU-2364	2222949 pbpG	pbpG	2221960	57
TU-3572	REV	2223043	2223668	625 MU-2365	2223673 yohC	yohC	2223066	20
TU-3573	REV	2223043	2223668	625 MU-2365	2223686 yohC	yohC	2223066	33
TU-3574	REV	2224518	2225293	775 MU-2366	2225320 yohF	yohF	2224531	28
TU-3575	REV	2225345	2226780	1435 MU-2367	mdtQ	mdtQ	2225345	
TU-3576	REV	2227268	2228393	1125 MU-2368	2228423 dusC	dusC	2227460	16
TU-3577	REV	2227268	2228393	1125 MU-2368	2228429 dusC	dusC	2227460	22
TU-3578	REV	2234571	2236146	1575 MU-2369	2236029 mgIC	mgIC	2234765	254
TU-3579	REV	2234571	2238671	4100 MU-2369;MU-2370	2238475 mgIC;mgIA;mgIB	mgIB	2237372	105
TU-3580	REV	2238996	2241796	2800 MU-2371	2241821 galS;yeiB;folE	folE	2241006	147
TU-3581	REV	2242671	2244946	2275 MU-2372	2244951 cirA	cirA	2242800	160
TU-3582	REV	2245096	2246646	1550 MU-2373	2246582 lysP	lysP	2245085	28
TU-3583	REV	2246746	2247696	950 MU-2374	2247664 yeiE	yeiE	2246759	24
TU-3584	REV	2247746	2247921	175 MU-2375	2247938 NT			
TU-3585	REV	2250917	2253208	2291 MU-2376	nupX;rihB	rihB	2252267	
TU-3586	REV	2254107	2255357	1250 MU-2377	yeiM	yeiM	2254107	
TU-3587	REV	2255451	2257318	1867 MU-2378	yeiN;yeiC	yeiC	2256377	
TU-3588	REV	2257496	2261596	4100 MU-2379	2261616 fruA;fruK;fruB	fruB	2260387	99
TU-3589	REV	2263063	2263317	254 MU-2380	yeiW	yeiW	2263063	
TU-3590	REV	2275071	2276446	1375 MU-2381	2276298 yejG	yejG	2275915	39
TU-3591	REV	2276621	2278546	1925 MU-2382	2278527 bcr;rsuA	rsuA	2277810	22
TU-3592	REV	2276621	2278546	1925 MU-2382	2278553 bcr;rsuA	rsuA	2277810	48

TU-3593	REV	2276621	2278546	1925 MU-2382	2278566 bcr;rsuA	rsuA	2277810	61
TU-3594	REV	2280897	2282072	1175 MU-2383	2281991 yejK	yejK	2280962	22
TU-3595	REV	2280897	2282072	1175 MU-2383	2282034 yejK	yejK	2280962	65
TU-3596	REV	2284463	2286863	2400 MU-2384	2286797 yejO	yejO	2284412	-139
TU-3597	REV	2286938	2288113	1175 MU-2385	2288240 insH	insH	2287087	137
TU-3598	REV	2288136	2288202	66 MU-2384-1	yejO	yejO	2288136	
TU-3599	REV	2289663	2295938	6275 MU-2386	2295930 ccmH;ccmG;ccmF;ccmE;ccmD;ccmC;ccmB;c cmA	ccmA	2295043	264
TU-3600	REV	2296163	2300938	4775 MU-2387	napC;napB;napH;napG;napA;napD	napA	2298289	
TU-3601	REV	2302463	2304825	2362 MU-2388	2304826 mqo	mqo	2303130	50
TU-3602	REV	2305050	2306825	1775 MU-2389	2306662 yojI	yojI	2304994	25
TU-3603	REV	2307000	2308575	1575 MU-2390	2308429 alkB;ada	ada	2307363	2
TU-3604	REV	2308700	2311000	2300 MU-2391	2310826 apbE;ompC	ompC	2309668	55
TU-3605	REV	2308700	2311000	2300 MU-2391	2310858 apbE;ompC	ompC	2309668	87
TU-3606	REV	2314775	2318100	3325 MU-2392	2318151 rcsC	rcsC	2315049	253
TU-3607	REV	2325389	2334666	9277 MU-2393	yfaP;yfaQ;yfaS;yfaT;yfaA	yfaA	2332978	
TU-3608	REV	2334825	2337450	2625 MU-2394	2337473 gyrA	gyrA	2334815	31
TU-3609	REV	2334825	2337450	2625 MU-2394	2337479 gyrA	gyrA	2334815	37
TU-3610	REV	2338575	2339925	1350 MU-2395	2340036 NT			
TU-3611	REV	2338439	2342191	3752 MU-2396	yfaL	yfaL	2338439	
TU-3612	REV	2342616	2342759	143 MU-2397	2342788 ypaB	ypaB	2342616	29
TU-3613	REV	2346875	2347500	625 MU-2398	2347522 inaA	inaA	2346844	28
TU-3614	REV	2347900	2350078	2178 MU-2399	2350000 glpQ;glpT	glpT	2349038	-396
TU-3615	REV	2356204	2360154	3950 MU-2400	2360256 yfaU;yfaV;yfaW;yfaX	yfaX	2359451	23
TU-3616	REV	2360479	2361679	1200 MU-2401	2361677 yfaY	yfaY	2360453	22
TU-3617	REV	2361879	2362304	425 MU-2402	2362329 yfaZ	yfaZ	2361755	32
TU-3618	REV	2361879	2362304	425 MU-2402	2362338 yfaZ	yfaZ	2361755	41
TU-3619	REV	2363040	2363642	602 MU-2403	ais	ais	2363040	
TU-3620	REV	2370879	2371554	675 MU-2404	2371594 pmrD	pmrD	2371294	34
TU-3621	REV	2371654	2375004	3350 MU-2405	2374936 menE;menC;menB	menB	2373984	95
TU-3622	REV	2371654	2378679	7025 MU-2405;MU-2406	2378723 menE;menC;menB;yfbB;menD;menF	menF	2377370	58
TU-3623	REV	2378704	2379154	450 MU-2407	2379075 elaB	elaB	2378744	26
TU-3624	REV	2379179	2379554	375 MU-2408	2379587 elaA	elaA	2379104	22
TU-3625	REV	2382530	2383755	1225 MU-2409	2383776 yfbK	yfbK	2382017	32
TU-3626	REV	2382530	2383755	1225 MU-2409	2383833 yfbK	yfbK	2382017	89
TU-3627	REV	2385732	2386448	716 MU-2410	yfbN	yfbN	2385732	
TU-3628	REV	2387905	2403505	15600 MU-2411	2403158 nuoN;nuoM;nuoL;nuoK;nuoJ;nuoI;nuoH;nuo G;nuoF;nuoE;nuoC;nuoB;nuoA	nuoA	2402651	64
TU-3629	REV	2387905	2403505	15600 MU-2411	2403180 nuoN;nuoM;nuoL;nuoK;nuoJ;nuoI;nuoH;nuo G;nuoF;nuoE;nuoC;nuoB;nuoA	nuoA	2402651	86
TU-3630	REV	2387905	2403505	15600 MU-2411	2403201 nuoN;nuoM;nuoL;nuoK;nuoJ;nuoI;nuoH;nuo G;nuoF;nuoE;nuoC;nuoB;nuoA	nuoA	2402651	107
TU-3631	REV	2387905	2403505	15600 MU-2411	2403219 nuoN;nuoM;nuoL;nuoK;nuoJ;nuoI;nuoH;nuo G;nuoF;nuoE;nuoC;nuoB;nuoA	nuoA	2402651	125
TU-3632	REV	2387905	2403505	15600 MU-2411	2403397 nuoN;nuoM;nuoL;nuoK;nuoJ;nuoI;nuoH;nuo G;nuoF;nuoE;nuoC;nuoB;nuoA	nuoA	2402651	303



TU-3633	REV	2403697	2405097	1400 MU-2412	2404785	lrhA	lrhA	2403725	122
TU-3634	REV	2403697	2405097	1400 MU-2412	2405023	lrhA	lrhA	2403725	360
TU-3635	REV	2403697	2405097	1400 MU-2412	2405123	lrhA	lrhA	2403725	460
TU-3636	REV	2407547	2409372	1825 MU-2413	2409504	yfbS	yfbS	2407542	130
TU-3637	REV	2409472	2410647	1175 MU-2414	2410652	yfbT;yfbU	yfbU	2410122	36
TU-3638	REV	2409472	2410647	1175 MU-2414	2410658	yfbT;yfbU	yfbU	2410122	42
TU-3639	REV	2409472	2410647	1175 MU-2414	2410667	yfbT;yfbU	yfbU	2410122	51
TU-3640	REV	2410697	2411772	1075 MU-2415	2411591	yfbV	yfbV	2410699	437
TU-3641	REV	2410697	2411772	1075 MU-2415	2411704	yfbV	yfbV	2410699	550
TU-3642	REV	2416672	2417847	1175 MU-2416	2417830	yfcD;yfcE	yfcE	2417256	20
TU-3643	REV	2417897	2418547	650 MU-2417	2418525	yfcF	yfcF	2417863	18
TU-3644	REV	2417897	2418547	650 MU-2417	2418532	yfcF	yfcF	2417863	25
TU-3645	REV	2420672	2421297	625 MU-2418		yfcI	yfcI	2420671	
TU-3646	REV	2421497	2424897	3400 MU-2419	2424837	hisP;hisM;hisQ;hisJ	hisJ	2424028	27
TU-3647	REV	2421497	2424897	3400 MU-2419	2424844	hisP;hisM;hisQ;hisJ	hisJ	2424028	34
TU-3648	REV	2421497	2424897	3400 MU-2419	2424859	hisP;hisM;hisQ;hisJ	hisJ	2424028	49
TU-3649	REV	2424922	2425922	1000 MU-2420	2425901	argT	argT	2425031	88
TU-3650	REV	2424922	2425922	1000 MU-2420	2425959	argT	argT	2425031	146
TU-3651	REV	2426172	2428672	2500 MU-2421	2428847	ubiX;purF;cvpA	cvpA	2428297	62
TU-3652	REV	2428697	2429672	975 MU-2422	2429694	dedD	dedD	2429044	-12
TU-3653	REV	2428697	2429672	975 MU-2422	2429833	dedD	dedD	2429044	127
TU-3654	REV	2429697	2432122	2425 MU-2423	2431995	folC;accD	accD	2431034	47
TU-3655	REV	2429697	2432122	2425 MU-2423	2432036	folC;accD	accD	2431034	88
TU-3656	REV	2432147	2433397	1250 MU-2424	2433217	dedA	dedA	2432104	454
TU-3657	REV	2432147	2435247	3100 MU-2424;MU-2425	2435363	dedA;truA;usg	usg	2433658	692
TU-3658	REV	2432147	2435872	3725 MU-2424;MU-2425;MU-2426	2435905	dedA;truA;usg;pdxB	pdxB	2434737	32
TU-3659	REV	2436964	2438142	1178 MU-2427		yfcJ	yfcJ	2436964	
TU-3660	REV	2438347	2439722	1375 MU-2428	2439663	fabB	fabB	2438407	36
TU-3661	REV	2441747	2442447	700 MU-2429	2442251	yfcL	yfcL	2441913	60
TU-3662	REV	2441747	2442447	700 MU-2429	2442286	yfcL	yfcL	2441913	95
TU-3663	REV	2441747	2446473	4726 MU-2429;MU-2430	2446495	yfcL;yfcM;yfcA;mepA;aroC;prmB	prmB	2445530	33
TU-3664	REV	2447073	2448048	975 MU-2431	2447951	NT			
TU-3665	REV	2452323	2452698	375 MU-2432	2452762	NT			
TU-3666	REV	2447250	2453668	6418 MU-2433		yfcO;yfcP;yfcQ;yfcR;yfcS;yfcU;yfcV	yfcV	2453105	
TU-3667	REV	2454348	2454848	500 MU-2434	2454827	sixA	sixA	2454349	-7
TU-3668	REV	2454348	2454848	500 MU-2434	2454938	sixA	sixA	2454349	104
TU-3669	REV	2454898	2458500	3602 MU-2435	2458531	fadJ;fadI	fadI	2457181	40
TU-3670	REV	2458675	2459250	575 MU-2436	2459001	yfcZ	yfcZ	2458672	45
TU-3671	REV	2462328	2463203	875 MU-2437	2463106	vacJ	vacJ	2462274	77
TU-3672	REV	2462328	2463203	875 MU-2437	2463157	vacJ	vacJ	2462274	128
TU-3673	REV	2468553	2468678	125 MU-2438	2468671	NT			
TU-3674	REV	2468553	2468678	125 MU-2438	2468686	NT			
TU-3675	REV	2469099	2471346	2247 MU-2439		yfdK;yfdL;yfdM;yfdN;yfdO	yfdO	2470900	
TU-3676	REV	2474803	2475628	825 MU-2440	2475745	dsdC	dsdC	2474716	94
TU-3677	REV	2478660	2481361	2701 MU-2441		emrY;emrK	emrK	2480198	
TU-3678	REV	2485679	2486379	700 MU-2442	2486315	NT			

TU-3679	REV	2486045	2488208	2163 MU-2443	yfdE;yfdV	yfdV	2487264	
TU-3680	REV	2488278	2491276	2998 MU-2444	oxc;frc	frc	2490026	
TU-3681	REV	2491789	2492424	635 MU-2445	yfdX	yfdX	2491789	
TU-3682	REV	2492854	2493329	475 MU-2446	2493341 yfdY	yfdY	2493072	27
TU-3683	REV	2494216	2494651	435 MU-2447	tpke70	tpke70	2494216	
TU-3684	REV	2495129	2496354	1225 MU-2448	2496467 yfdZ	yfdZ	2495079	150
TU-3685	REV	2500012	2506264	6252 MU-2449	fryA;ypdE;ypdF;fryC;fryB	fryB	2505938	
TU-3686	REV	2506554	2508054	1500 MU-2450	2507954 glk	glk	2506483	506
TU-3687	REV	2509479	2510854	1375 MU-2451	2510851 mntH	mntH	2509490	123
TU-3688	REV	2509479	2510854	1375 MU-2451	2510875 mntH	mntH	2509490	147
TU-3689	REV	2513104	2516004	2900 MU-2452	2515900 yfeA	yfeA	2513665	46
TU-3690	REV	2516054	2516254	200 MU-2453	2516263 alaX;alaW	alaW	2516178	10
TU-3691	REV	2517329	2518779	1450 MU-2454	2518736 gltX	gltX	2517279	42
TU-3692	REV	2517329	2518779	1450 MU-2454	2518746 gltX	gltX	2517279	52
TU-3693	REV	2517329	2518779	1450 MU-2454	2518796 gltX	gltX	2517279	102
TU-3694	REV	2519754	2520429	675 MU-2455	2520518 xapR	xapR	2519615	19
TU-3695	REV	2519754	2520429	675 MU-2455	2520527 xapR	xapR	2519615	28
TU-3696	REV	2520751	2522900	2149 MU-2456	xapB;xapA	xapA	2522067	
TU-3697	REV	2524481	2524806	325 MU-2457	yfeR	yfeR	2523952	
TU-3698	REV	2526156	2528231	2075 MU-2458	2528246 ypeB;ligA	ligA	2526183	48
TU-3699	REV	2528256	2529281	1025 MU-2459	2529301 zipA	zipA	2528269	46
TU-3700	REV	2534456	2535306	850 MU-2460	2535298 pdxK	pdxK	2534408	39
TU-3701	REV	2534456	2535306	850 MU-2460	2535305 pdxK	pdxK	2534408	46
TU-3702	REV	2536106	2541558	5452 MU-2461	2541580 cysM;cysA;cysW;cysU;cysP	cysP	2540534	30
TU-3703	REV	2541710	2542660	950 MU-2462	2542686 ucpA	ucpA	2541854	41
TU-3704	REV	2542960	2543635	675 MU-2463	yfeT	yfeT	2542774	
TU-3705	REV	2547485	2548785	1300 MU-2464	2548612 yfeX	yfeX	2547668	45
TU-3706	REV	2547485	2548785	1300 MU-2464	2548680 yfeX	yfeX	2547668	113
TU-3707	REV	2547485	2550160	2675 MU-2464;MU-2465	2550165 yfeX;yfeY;yfeZ;ypeA	ypeA	2549735	5
TU-3708	REV	2547485	2550160	2675 MU-2464;MU-2465	2550190 yfeX;yfeY;yfeZ;ypeA	ypeA	2549735	30
TU-3709	REV	2547485	2550160	2675 MU-2464;MU-2465	2550324 yfeX;yfeY;yfeZ;ypeA	ypeA	2549735	164
TU-3710	REV	2552260	2556910	4650 MU-2466	2556832 eutR;eutK;eutL;eutC;eutB	eutB	2555340	131
TU-3711	REV	2552260	2556910	4650 MU-2466	2556852 eutR;eutK;eutL;eutC;eutB	eutB	2555340	151
TU-3712	REV	2558985	2559061	76 MU-2467	2559079 NT			
TU-3713	REV	2563503	2566129	2626 MU-2468	eutA;eutH	eutH	2564903	
TU-3714	REV	2566346	2570072	3726 MU-2469	eutG;eutJ;eutE;eutN	eutN	2569785	
TU-3715	REV	2570179	2573827	3648 MU-2470	eutM;eutD;eutT;eutQ;eutP;eutS	eutS	2573492	
TU-3716	REV	2574112	2576512	2400 MU-2471	2576431 maeB	maeB	2574120	32
TU-3717	REV	2574112	2576512	2400 MU-2471	2576547 maeB	maeB	2574120	148
TU-3718	REV	2574112	2576512	2400 MU-2471	2576553 maeB	maeB	2574120	154
TU-3719	REV	2579912	2580812	900 MU-2472	2580921 ypfG	ypfG	2579756	122
TU-3720	REV	2579912	2580812	900 MU-2472	2580929 ypfG	ypfG	2579756	130
TU-3721	REV	2580987	2581487	500 MU-2473	2581523 nudK	nudK	2580925	23
TU-3722	REV	2581568	2583547	1979 MU-2474	aegA	aegA	2581568	
TU-3723	REV	2588763	2589063	300 MU-2475	2588907 ypfM	ypfM	2588829	19
TU-3724	REV	2591113	2591863	750 MU-2476	2591811 ypfH	ypfH	2591094	19

TU-3725	REV	2591113	2594863	3750 MU-2476;MU-2477	2594785 ypfH;ypfI;ypfJ	ypfJ	2593896	26
TU-3726	REV	2591113	2594863	3750 MU-2476;MU-2477	2594806 ypfH;ypfI;ypfJ	ypfJ	2593896	47
TU-3727	REV	2594913	2595788	875 MU-2478	2595666 purC	purC	2594927	26
TU-3728	REV	2594913	2595788	875 MU-2478	2595676 purC	purC	2594927	36
TU-3729	REV	2594913	2595788	875 MU-2478	2595755 purC	purC	2594927	115
TU-3730	REV	2595813	2597813	2000 MU-2479	2597806 bamC;dapA	dapA	2596904	24
TU-3731	REV	2612440	2613915	1475 MU-2480	2613938 yfgO	yfgO	2612842	35
TU-3732	REV	2616065	2616840	775 MU-2481	2616827 hda	hda	2616097	-16
TU-3733	REV	2616065	2618215	2150 MU-2481;MU-2482	2618258 hda;uraA	uraA	2616893	76
TU-3734	REV	2616065	2618215	2150 MU-2481;MU-2482	2618264 hda;uraA	uraA	2616893	82
TU-3735	REV	2618266	2618916	650 MU-2483	2618924 upp	upp	2618268	30
TU-3736	REV	2618266	2618916	650 MU-2483	2618931 upp	upp	2618268	37
TU-3737	REV	2624717	2626960	2243 MU-2484	yfgF	yfgF	2624717	
TU-3738	REV	2628978	2630778	1800 MU-2485	2630583 guaA	guaA	2628980	26
TU-3739	REV	2628978	2630778	1800 MU-2485	2630625 guaA	guaA	2628980	68
TU-3740	REV	2628978	2630778	1800 MU-2485	2630663 guaA	guaA	2628980	106
TU-3741	REV	2628978	2632103	3125 MU-2485;MU-2486	2632099 guaA;guaB	guaB	2630626	7
TU-3742	REV	2628978	2632103	3125 MU-2485;MU-2486	2632112 guaA;guaB	guaB	2630626	20
TU-3743	REV	2628978	2632103	3125 MU-2485;MU-2486	2632120 guaA;guaB	guaB	2630626	28
TU-3744	REV	2628978	2632103	3125 MU-2485;MU-2486	2632127 guaA;guaB	guaB	2630626	35
TU-3745	REV	2633728	2633828	100 MU-2487	2633893 yfgJ	yfgJ	2633621	57
TU-3746	REV	2633878	2635878	2000 MU-2488	2635401 der	der	2633906	23
TU-3747	REV	2633878	2635878	2000 MU-2488	2635441 der	der	2633906	63
TU-3748	REV	2633878	2635878	2000 MU-2488	2635482 der	der	2633906	104
TU-3749	REV	2633878	2635878	2000 MU-2488	2635811 der	der	2633906	433
TU-3750	REV	2635903	2638754	2851 MU-2489	2638708 bamB;yfgM;hisS;sroE	sroE	2638617	0
TU-3751	REV	2638779	2640879	2100 MU-2490	2640937 ispG;yfgA	yfgA	2639853	71
TU-3752	REV	2638779	2640879	2100 MU-2490	2640954 ispG;yfgA	yfgA	2639853	88
TU-3753	REV	2638779	2640879	2100 MU-2490	2641026 ispG;yfgA	yfgA	2639853	160
TU-3754	REV	2640904	2642504	1600 MU-2491	2642409 rlmN	rlmN	2641151	104
TU-3755	REV	2642529	2642954	425 MU-2492	2642905 ndk	ndk	2642455	19
TU-3756	REV	2642529	2642954	425 MU-2492	2642935 trnk	ndk	2642455	49
TU-3757	REV	2643079	2648855	5776 MU-2493	2648867 pbpC	pbpC	2643035	3520
TU-3758	REV	2643079	2650330	7251 MU-2493;MU-2494	2650349 pbpC;yfhM	yfhM	2645348	40
TU-3759	REV	2643079	2650330	7251 MU-2493;MU-2494	2650424 pbpC;yfhM	yfhM	2645348	115
TU-3760	REV	2651410	2651460	50 MU-2495	2651695 C0614	C0614	2651474	135
TU-3761	REV	2652199	2654474	2275 MU-2496	2654561 sseB;pepB	pepB	2653097	181
TU-3762	REV	2652199	2654474	2275 MU-2496	2654589 sseB;pepB	pepB	2653097	209
TU-3763	REV	2654499	2657174	2675 MU-2497	2657012 iscX;fdx;hscA	hscA	2655107	55
TU-3764	REV	2657199	2658052	853 MU-2498	2657928 hscB;iscA	iscA	2657585	20
TU-3765	REV	2657199	2658052	853 MU-2498	2658178 hscB;iscA	iscA	2657585	270
TU-3766	REV	2658077	2660227	2150 MU-2499	2660290 iscU;iscS;iscR	iscR	2659665	137
TU-3767	REV	2660277	2661352	1075 MU-2500	2661369 trmJ	trmJ	2660605	24
TU-3768	REV	2665027	2666927	1900 MU-2501	2666961 hcaT;hcaR	hcaR	2666028	43
TU-3769	REV	2665027	2666927	1900 MU-2501	2666967 hcaT;hcaR	hcaR	2666028	49
TU-3770	REV	2671927	2675502	3575 MU-2502	2675475 yphB;yphC;yphD	yphD	2673849	628

TU-3771	REV	2671927	2675502	3575 MU-2502	2675603 yphB;yphC;yphD	yphD	2673849	756
TU-3772	REV	2671927	2677302	5375 MU-2502;MU-2503	2677426 yphB;yphC;yphD;yphE;yphF	yphF	2676406	37
TU-3773	REV	2671927	2680527	8600 MU-2502;MU-2503;MU-2504	2680419 yphB;yphC;yphD;yphE;yphF;yphG	yphG	2677486	-348
TU-3774	REV	2682152	2683577	1425 MU-2505	2683559 glyA	glyA	2682276	30
TU-3775	REV	2682152	2683577	1425 MU-2505	2683594 glyA	glyA	2682276	65
TU-3776	REV	2685102	2685277	175 MU-2506	2685463 glnB	glnB	2685092	33
TU-3777	REV	2685102	2685277	175 MU-2506	2685545 glnB	glnB	2685092	115
TU-3778	REV	2685302	2688227	2925 MU-2507	2688207 yfhA;yfhG	yfhG	2686815	679
TU-3779	REV	2685302	2688227	2925 MU-2507	2688341 yfhA;yfhG	yfhG	2686815	813
TU-3780	REV	2688302	2689352	1050 MU-2508	2689362 yfhK;glmY	glmY	2689179	0
TU-3781	REV	2689627	2693577	3950 MU-2509	2693611 purL	purL	2689678	46
TU-3782	REV	2695302	2696577	1275 MU-2510	2696606 tadA;yfhB	yfhB	2695937	34
TU-3783	REV	2695302	2696577	1275 MU-2510	2696614 tadA;yfhB	yfhB	2695937	42
TU-3784	REV	2698202	2698377	175 MU-2511	2698358 ryfB	ryfB	2698081	-41
TU-3785	REV	2698714	2702264	3550 MU-2512	2702104 acpS;pdxJ;recO;era;rnc	rnc	2701405	19
TU-3786	REV	2698714	2702264	3550 MU-2512	2702115 acpS;pdxJ;recO;era;rnc	rnc	2701405	30
TU-3787	REV	2698714	2702264	3550 MU-2512	2702123 acpS;pdxJ;recO;era;rnc	rnc	2701405	38
TU-3788	REV	2698714	2702264	3550 MU-2512	2702205 acpS;pdxJ;recO;era;rnc	rnc	2701405	120
TU-3789	REV	2702364	2705289	2925 MU-2513	2705232 lepB;lepA	lepA	2703347	86
TU-3790	REV	2705364	2707439	2075 MU-2514	2707434 rseC;rseB;rseA	rseA	2706776	8
TU-3791	REV	2705364	2707439	2075 MU-2514	2707441 rseC;rseB;rseA	rseA	2706776	15
TU-3792	REV	2705364	2707439	2075 MU-2514	2707472 rseC;rseB;rseA	rseA	2706776	46
TU-3793	REV	2705364	2707439	2075 MU-2514	2707589 rseC;rseB;rseA	rseA	2706776	163
TU-3794	REV	2705364	2707439	2075 MU-2514	2707654 rseC;rseB;rseA	rseA	2706776	228
TU-3795	REV	2707464	2708339	875 MU-2515	2708110 rpoE	rpoE	2707459	76
TU-3796	REV	2707464	2708339	875 MU-2515	2708252 rpoE	rpoE	2707459	218
TU-3797	REV	2709964	2710789	825 MU-2516	2710822 yfiC	yfiC	2710049	36
TU-3798	REV	2712464	2713339	875 MU-2517	2713408 yfiE	yfiE	2712461	66
TU-3799	REV	2713914	2714514	600 MU-2518	2714490 yfiD	yfiD	2714088	19
TU-3800	REV	2713914	2714514	600 MU-2518	2714508 yfiD	yfiD	2714088	37
TU-3801	REV	2713914	2714514	600 MU-2518	2714523 yfiD	yfiD	2714088	52
TU-3802	REV	2713914	2714514	600 MU-2518	2714531 yfiD	yfiD	2714088	60
TU-3803	REV	2713914	2714514	600 MU-2518	2714543 yfiD	yfiD	2714088	72
TU-3804	REV	2715589	2716639	1050 MU-2519	2716576 yfiF	yfiF	2715513	26
TU-3805	REV	2715589	2716639	1050 MU-2519	2716615 yfiF	yfiF	2715513	65
TU-3806	REV	2715589	2716639	1050 MU-2519	2716630 yfiF	yfiF	2715513	80
TU-3807	REV	2722140	2723815	1675 MU-2520	2723834 kgtP	kgtP	2722470	66
TU-3808	REV	2724090	2724215	125 MU-2521	2724210 rrfG	rrfG	2724091	0
TU-3809	REV	2724240	2729344	5104 MU-2522	2729179 rrfG;rrlG;gltW;rrsG	rrsG	2727638	0
TU-3810	REV	2729369	2732194	2825 MU-2523	2732227 clpB	clpB	2729622	32
TU-3811	REV	2732219	2732294	75 MU-2524	2732315 ryfD	ryfD	2732175	-2
TU-3812	REV	2732319	2734119	1800 MU-2525	2734086 yfiH;rluD	rluD	2733053	53
TU-3813	REV	2736069	2736544	475 MU-2526	2736563 NT			
TU-3814	REV	2736994	2739469	2475 MU-2527	2739331 tyrA;aroF	aroF	2738102	159
TU-3815	REV	2742119	2744220	2101 MU-2528	2744276 rplS;trmD;rimM;rpsP	rpsP	2743959	69
TU-3816	REV	2742119	2744220	2101 MU-2528	2744314 rplS;trmD;rimM;rpsP	rpsP	2743959	107

TU-3817	REV	2744245	2745870	1625 MU-2529	2745876 ffh	ffh	2744456	59
TU-3818	REV	2747645	2748820	1175 MU-2530	2748759 grpE	grpE	2748137	29
TU-3819	REV	2747645	2748820	1175 MU-2530	2748769 grpE	grpE	2748137	39
TU-3820	REV	2752045	2752745	700 MU-2531	2752770 yfjF;yfjG	yfjG	2752310	-16
TU-3821	REV	2755666	2756622	956 MU-2532	yfjH	yfjH	2755666	
TU-3822	REV	2759336	2763486	4150 MU-2533	2763334 yfjK;yfjL	yfjL	2761559	159
TU-3823	REV	2763535	2763798	263 MU-2534	yfjM	yfjM	2763535	
TU-3824	REV	2764086	2764211	125 MU-2535	2764225 NT			
TU-3825	REV	2769492	2770017	525 MU-2536	2769887 NT			
TU-3826	REV	2770092	2770967	875 MU-2537	yfjU;yfjV	yfjV	2770189	
TU-3827	REV	2776268	2779593	3325 MU-2538	2779623 NT			
TU-3828	REV	2776168	2780748	4580 MU-2539	ypjA	ypjA	2776168	
TU-3829	REV	2781087	2781326	239 MU-2540	pinH	pinH	2781087	
TU-3830	REV	2781660	2783033	1373 MU-2541	ypjC	ypjC	2781660	
TU-3831	REV	2783799	2783824	25 MU-2542	2783978 ileY	ileY	2783784	119
TU-3832	REV	2794102	2794277	175 MU-2543	2794373 NT			
TU-3833	REV	2794302	2794827	525 MU-2544	2794835 ygaU	ygaU	2794359	27
TU-3834	REV	2794877	2795077	200 MU-2545	2795088 yqaE	yqaE	2794892	38
TU-3835	REV	2794877	2795077	200 MU-2545	2795098 yqaE	yqaE	2794892	48
TU-3836	REV	2794877	2795077	200 MU-2545	2795107 yqaE	yqaE	2794892	57
TU-3837	REV	2796002	2796552	550 MU-2546	2796550 stpA	stpA	2796113	33
TU-3838	REV	2796002	2796552	550 MU-2546	2796559 stpA	stpA	2796113	42
TU-3839	REV	2796002	2796552	550 MU-2546	2796579 stpA	stpA	2796113	62
TU-3840	REV	2796002	2796552	550 MU-2546	2796599 stpA	stpA	2796113	82
TU-3841	REV	2797477	2798177	700 MU-2547	2798154 ygaC	ygaC	2797672	138
TU-3842	REV	2798302	2798702	400 MU-2548	2798693 NT			
TU-3843	REV	2807153	2807578	425 MU-2549	2807603 NT			
TU-3844	REV	2809453	2809503	50 MU-2550	NT			
TU-3845	REV	2812003	2812906	903 MU-2551	2812784 luxS	luxS	2812240	29
TU-3846	REV	2812003	2812906	903 MU-2551	2812837 luxS	luxS	2812240	82
TU-3847	REV	2812003	2812906	903 MU-2551	2812900 luxS	luxS	2812240	145
TU-3848	REV	2812931	2814756	1825 MU-2552	2814612 gshA	gshA	2812905	151
TU-3849	REV	2814806	2815531	725 MU-2553	2815550 yqaA;yqaB	yqaB	2814959	25
TU-3850	REV	2815731	2815856	125 MU-2554	2815942 argQ	argQ	2815806	60
TU-3851	REV	2816081	2816131	50 MU-2555	argZ	argZ	2816081	
TU-3852	REV	2816231	2816281	50 MU-2556	2816357 argY	argY	2816220	61
TU-3853	REV	2816506	2816706	200 MU-2557	2816667 argV;serV	serV	2816575	0
TU-3854	REV	2816931	2817156	225 MU-2558	2817211 csrA	csrA	2816983	43
TU-3855	REV	2816931	2817156	225 MU-2558	2817220 csrA	csrA	2816983	52
TU-3856	REV	2816931	2817156	225 MU-2558	2817295 csrA	csrA	2816983	127
TU-3857	REV	2817181	2820081	2900 MU-2559	2820046 alaS	alaS	2817403	13
TU-3858	REV	2817181	2820081	2900 MU-2559	2820060 alaS	alaS	2817403	27
TU-3859	REV	2817181	2820081	2900 MU-2559	2820112 alaS	alaS	2817403	79
TU-3860	REV	2820161	2820661	500 MU-2560	recX	recX	2820161	
TU-3861	REV	2820781	2821831	1050 MU-2561	2821830 recA	recA	2820730	39
TU-3862	REV	2820781	2821831	1050 MU-2561	2821834 recA	recA	2820730	43

TU-3863	REV	2820781	2821831	1050 MU-2561	2821840 recA	recA	2820730	49
TU-3864	REV	2820781	2821831	1050 MU-2561	2821878 recA	recA	2820730	87
TU-3865	REV	2821881	2822381	500 MU-2562	2822395 ygaD	ygaD	2821871	27
TU-3866	REV	2822531	2823606	1075 MU-2563	2823564 mltB	mltB	2822513	-34
TU-3867	REV	2828856	2830306	1450 MU-2564	2830332 norR	norR	2828797	21
TU-3868	REV	2833581	2835506	1925 MU-2565	2835567 hypF	hypF	2833195	120
TU-3869	REV	2835600	2836127	527 MU-2566	hydN	hydN	2835600	
TU-3870	REV	2836281	2837281	1000 MU-2567	2837310 ascG	ascG	2836276	21
TU-3871	REV	2840606	2841081	475 MU-2568	2841124 hycI	hycI	2840595	59
TU-3872	REV	2840595	2848457	7862 MU-2569	hycI;hycH;hycG;hycF;hycE;hycD;hycC;hycB; hycA	hycA	2847996	
TU-3873	REV	2854506	2854831	325 MU-2570	2854922 ygbA	ygbA	2854475	94
TU-3874	REV	2858532	2859257	725 MU-2571	2859278 ygbI	ygbI	2858489	-8
TU-3875	REV	2864582	2866082	1500 MU-2572	2866141 rpoS	rpoS	2864581	568
TU-3876	REV	2864582	2866857	2275 MU-2572;MU-2573	2866803 rpoS;nlpD	nlpD	2865636	28
TU-3877	REV	2866882	2868482	1600 MU-2574	2868608 pcm;surE	surE	2867535	312
TU-3878	REV	2866882	2868482	1600 MU-2574	2868673 pcm;surE	surE	2867535	377
TU-3879	REV	2868507	2871007	2500 MU-2575	2870979 truD;ispF;ispD;ftsB	ftsB	2870531	137
TU-3880	REV	2871032	2871407	375 MU-2576	ygbE	ygbE	2871036	
TU-3881	REV	2871432	2874382	2950 MU-2577	2874392 cysC;cysN;cysD	cysD	2873443	41
TU-3882	REV	2876257	2876532	275 MU-2578	2876455 NT			
TU-3883	REV	2876607	2876782	175 MU-2579	ygbF	ygbF	2876591	
TU-3884	REV	2876607	2878332	1725 MU-2579;MU-2580	2878363 ygbF;ygbT;ygcH	ygcH	2877810	-46
TU-3885	REV	2876607	2878332	1725 MU-2579;MU-2580	2878413 ygbF;ygbT;ygcH	ygcH	2877810	4
TU-3886	REV	2876607	2879082	2475 MU-2579;MU-2580;MU-2581	2878903 ygbF;ygbT;ygcH;ygcI	ygcI	2878396	-167
TU-3887	REV	2876607	2882160	5553 MU-2579;MU-2580;MU-2581;MU-2582	ygbF;ygbT;ygcH;ygcI;ygcJ;ygcK;ygcL	ygcL	2880652	
TU-3888	REV	2882675	2884250	1575 MU-2583	2884174 NT			
TU-3889	REV	2884425	2885125	700 MU-2584	ygcB	ygcB	2882575	
TU-3890	REV	2885450	2889978	4528 MU-2585	2889945 cysH;cysI;cysJ	cysJ	2888121	25
TU-3891	REV	2885450	2889978	4528 MU-2585	2889976 cysH;cysI;cysJ	cysJ	2888121	56
TU-3892	REV	2885450	2889978	4528 MU-2585	2889985 cysH;cysI;cysJ	cysJ	2888121	65
TU-3893	REV	2892978	2898499	5521 MU-2586	ygcQ;ygcR;ygcS;ygcU;ygcW	ygcW	2897510	
TU-3894	REV	2902088	2902513	425 MU-2587	2902483 NT			
TU-3895	REV	2902813	2903438	625 MU-2588	2903464 ygcF	ygcF	2902769	24
TU-3896	REV	2904663	2906838	2175 MU-2589	2905978 eno	eno	2904665	15
TU-3897	REV	2904663	2906838	2175 MU-2589	2905988 eno	eno	2904665	25
TU-3898	REV	2904663	2906838	2175 MU-2589	2906041 eno	eno	2904665	78
TU-3899	REV	2904663	2906838	2175 MU-2589	2906123 eno	eno	2904665	160
TU-3900	REV	2904663	2906838	2175 MU-2589	2906149 eno	eno	2904665	186
TU-3901	REV	2904663	2906838	2175 MU-2589	2906248 eno	eno	2904665	285
TU-3902	REV	2904663	2907838	3175 MU-2589;MU-2590	2907728 eno;pyrG	pyrG	2906051	40
TU-3903	REV	2907863	2909363	1500 MU-2591	2909279 mazG;chpA;chpR	chpR	2909113	-82
TU-3904	REV	2907863	2909363	1500 MU-2591	2909390 mazG;chpA;chpR	chpR	2909113	29
TU-3905	REV	2909388	2911938	2550 MU-2592	2911869 relA	relA	2909439	196
TU-3906	REV	2909388	2911938	2550 MU-2592	2912027 relA	relA	2909439	354

TU-3907	REV	2911963	2913213	1250 MU-2593	2913051 rumA	rumA	2911721	29
TU-3908	REV	2916188	2920088	3900 MU-2594	gudD;gudX;gudP	gudP	2918770	
TU-3909	REV	2920613	2922163	1550 MU-2595	2922159 yqcA;truC;yqcC	yqcC	2921806	24
TU-3910	REV	2922213	2922588	375 MU-2596	2922546 csrB	csrB	2922178	9
TU-3911	REV	2922213	2922588	375 MU-2596	2922556 csrB	csrB	2922178	19
TU-3912	REV	2922788	2923313	525 MU-2597	2923335 syd	syd	2922757	33
TU-3913	REV	2929940	2931340	1400 MU-2598	fucO;fucA	fucA	2931063	
TU-3914	REV	2938173	2939773	1600 MU-2599	2939689 ygdE;ygdD	ygdD	2939258	36
TU-3915	REV	2938173	2939773	1600 MU-2599	2939796 ygdE;ygdD	ygdD	2939258	143
TU-3916	REV	2939823	2940698	875 MU-2600	2940661 gcvA	gcvA	2939672	72
TU-3917	REV	2940773	2941273	500 MU-2601	2941194 ygdI	ygdI	2940940	27
TU-3918	REV	2940773	2941273	500 MU-2601	2941235 ygdI	ygdI	2940940	68
TU-3919	REV	2943073	2944123	1050 MU-2602	2944074 ygdL	ygdL	2943058	210
TU-3920	REV	2943073	2944123	1050 MU-2602	2944085 ygdL	ygdL	2943058	221
TU-3921	REV	2943073	2944123	1050 MU-2602	2944096 ygdL	ygdL	2943058	232
TU-3922	REV	2943073	2944123	1050 MU-2602	2944175 ygdL	ygdL	2943058	311
TU-3923	REV	2944148	2945298	1150 MU-2603	2945225 mltA	mltA	2944103	25
TU-3924	REV	2945623	2947248	1625 MU-2604	2947086 amiC	amiC	2945779	54
TU-3925	REV	2948673	2954098	5425 MU-2605	2953935 recD;recB	recB	2950483	-90
TU-3926	REV	2948673	2954098	5425 MU-2605	2954000 recD;recB	recB	2950483	-25
TU-3927	REV	2954123	2957000	2877 MU-2606	2957031 ptrA	ptrA	2954018	125
TU-3928	REV	2957075	2960500	3425 MU-2607	recC	recC	2957082	
TU-3929	REV	2960700	2962150	1450 MU-2608	2962199 ppdC;ygdB;ppdB;ppdA	ppdA	2961729	0
TU-3930	REV	2962375	2964300	1925 MU-2609	2964139 thyA;lgt	lgt	2963184	80
TU-3931	REV	2962375	2967000	4625 MU-2609;MU-2610	2967018 thyA;lgt;ptsP;rppH	rppH	2966469	19
TU-3932	REV	2967352	2967498	146 MU-2611	ygdT	ygdT	2967352	
TU-3933	REV	2970728	2972578	1850 MU-2612	2972534 lplT	lplT	2970691	650
TU-3934	REV	2970728	2972578	1850 MU-2612	2972645 lplT	lplT	2970691	761
TU-3935	REV	2972628	2974053	1425 MU-2613	2974072 aas	aas	2971877	36
TU-3936	REV	2974153	2974178	25 MU-2614	2974189 omrA	omrA	2974124	-22
TU-3937	REV	2974253	2974378	125 MU-2615	2974407 omrB	omrB	2974332	0
TU-3938	REV	2975353	2976928	1575 MU-2616	2976947 lysA	lysA	2975659	26
TU-3939	REV	2977803	2980403	2600 MU-2617	2980232 ygeA;araE	araE	2978786	28
TU-3940	REV	2980703	2981978	1275 MU-2618	kduD;kduI	kduI	2981310	
TU-3941	REV	2982530	2983630	1100 MU-2619	2983635 yqeF	yqeF	2982433	21
TU-3942	REV	2987957	2988382	425 MU-2620	yqeK	yqeK	2987957	
TU-3943	REV	2992482	2993114	632 MU-2621	ygeK	ygeK	2992482	
TU-3944	REV	2993336	2994382	1046 MU-2622	ygeN;ygeO	ygeO	2993984	
TU-3945	REV	2994300	2995800	1500 MU-2623	2995918 insD;insC	insC	2995257	296
TU-3946	REV	2995950	2996825	875 MU-2624	ygeQ	ygeQ	2995714	
TU-3947	REV	2996975	2997075	100 MU-2625	2997079 glyU	glyU	2997006	0
TU-3948	REV	2997225	2998125	900 MU-2626	2998266 ygeR	ygeR	2997158	353
TU-3949	REV	3002150	3003850	1700 MU-2627	3003869 ygeV	ygeV	3002030	61
TU-3950	REV	3010479	3013104	2625 MU-2628	3013059 yqeB;yqeC	yqeC	3012309	-20
TU-3951	REV	3014254	3014354	100 MU-2629	NT			
TU-3952	REV	3023279	3023654	375 MU-2630	3023597 NT			

TU-3953	REV	3023279	3023654	375 MU-2630	3023627 NT			
TU-3954	REV	3026552	3028902	2350 MU-2631	ygfS;ygfT	ygfT	3027034	
TU-3955	REV	3031802	3034327	2525 MU-2632	3034313 lysS;prfB	prfB	3033206	9
TU-3956	REV	3031802	3034327	2525 MU-2632	3034336 lysS;prfB	prfB	3033206	32
TU-3957	REV	3031802	3034327	2525 MU-2632	3034346 lysS;prfB	prfB	3033206	42
TU-3958	REV	3034377	3037902	3525 MU-2633	3037790 recJ;dsbC;xerD	xerD	3036869	25
TU-3959	REV	3034377	3037902	3525 MU-2633	3037800 recJ;dsbC;xerD	xerD	3036869	35
TU-3960	REV	3038252	3039252	1000 MU-2634	3039121 ygfX;ygfY	ygfY	3038826	29
TU-3961	REV	3040377	3041202	825 MU-2635	3041333 yqfA	yqfA	3040511	163
TU-3962	REV	3041302	3041702	400 MU-2636	3041676 yqfB	yqfB	3041334	31
TU-3963	REV	3043277	3043902	625 MU-2637	ygfF	ygfF	3043180	
TU-3964	REV	3044127	3047102	2975 MU-2638	3047178 gcvP	gcvP	3044190	115
TU-3965	REV	3044127	3048777	4650 MU-2638;MU-2639	3048789 gcvP;gcvH;gcvT	gcvT	3047595	100
TU-3966	REV	3044127	3048777	4650 MU-2638;MU-2639	3048798 gcvP;gcvH;gcvT	gcvT	3047595	109
TU-3967	REV	3049052	3053477	4425 MU-2640	3053495 visC;ubiH;pepP;ygfB	ygfB	3052888	29
TU-3968	REV	3055202	3056452	1250 MU-2641	3056477 serA	serA	3055200	45
TU-3969	REV	3056652	3057452	800 MU-2642	3057375 rpiA	rpiA	3056688	28
TU-3970	REV	3057403	3057723	320 MU-2643	yqfE	yqfE	3057403	
TU-3971	REV	3064299	3065195	896 MU-2644	ygfI	ygfI	3064299	
TU-3972	REV	3065383	3066133	750 MU-2645	3066137 yggE	yggE	3065362	35
TU-3973	REV	3065383	3066133	750 MU-2645	3066148 yggE	yggE	3065362	46
TU-3974	REV	3066183	3066833	650 MU-2646	3066858 argO	argO	3066195	28
TU-3975	REV	3066933	3067883	950 MU-2647	3067836 mscS	mscS	3066969	7
TU-3976	REV	3066933	3067883	950 MU-2647	3067856 mscS	mscS	3066969	27
TU-3977	REV	3066933	3067883	950 MU-2647	3067893 mscS	mscS	3066969	64
TU-3978	REV	3067958	3069308	1350 MU-2648	3069449 fbaA	fbaA	3068187	183
TU-3979	REV	3067958	3069308	1350 MU-2648	3069477 fbaA	fbaA	3068187	211
TU-3980	REV	3069333	3070883	1550 MU-2649	3070670 pgk	pgk	3069481	26
TU-3981	REV	3069333	3070883	1550 MU-2649	3070703 pgk	pgk	3069481	59
TU-3982	REV	3069333	3070883	1550 MU-2649	3070757 pgk	pgk	3069481	113
TU-3983	REV	3069333	3071908	2575 MU-2649;MU-2650	3071845 pgk;epd	epd	3070694	132
TU-3984	REV	3071958	3073458	1500 MU-2651	3073487 yggC;yggD	yggD	3072708	270
TU-3985	REV	3073239	3077352	4113 MU-2652	ygfF;yggP;cmtA;cmtB	cmtB	3076909	
TU-3986	REV	3077696	3079721	2025 MU-2653	3079737 tktA	tktA	3077666	80
TU-3987	REV	3080621	3081899	1278 MU-2654	3081893 speB	speB	3080899	74
TU-3988	REV	3080621	3081899	1278 MU-2654	3081908 speB	speB	3080899	89
TU-3989	REV	3080621	3081899	1278 MU-2654	3081948 speB	speB	3080899	129
TU-3990	REV	3080621	3081899	1278 MU-2654	3081968 speB	speB	3080899	149
TU-3991	REV	3080621	3081899	1278 MU-2654	3081990 speB	speB	3080899	171
TU-3992	REV	3081924	3083899	1975 MU-2655	3083950 speA	speA	3081957	17
TU-3993	REV	3081924	3083899	1975 MU-2655	3084078 speA	speA	3081957	145
TU-3994	REV	3083924	3084399	475 MU-2656	3084420 yqgB	yqgB	3083942	347
TU-3995	REV	3084421	3084672	251 MU-2657	ygqD	ygqD	3084421	
TU-3996	REV	3092122	3093102	980 MU-2658	3093107 yggR	yggR	3092122	5
TU-3997	REV	3096580	3097587	1007 MU-2659	ygqM	ygqM	3096580	
TU-3998	REV	3097949	3098749	800 MU-2660	ansB	ansB	3097704	



TU-3999	REV	3098974	3099649	675 MU-2661	3099822 yggN	yggN	3098926	177
TU-4000	REV	3099699	3100249	550 MU-2662	3100179 yggL	yggL	3099829	24
TU-4001	REV	3099699	3100249	550 MU-2662	3100215 yggL	yggL	3099829	60
TU-4002	REV	3099699	3100249	550 MU-2662	3100221 yggL	yggL	3099829	66
TU-4003	REV	3099699	3100249	550 MU-2662	3100257 yggL	yggL	3099829	102
TU-4004	REV	3099699	3100249	550 MU-2662	3100324 yggL	yggL	3099829	169
TU-4005	REV	3099699	3101099	1400 MU-2662;MU-2663	3101025 yggL;trmI	trmI	3100155	151
TU-4006	REV	3105079	3107263	2184 MU-2664	3107281 speC	speC	3105042	104
TU-4007	REV	3105079	3107263	2184 MU-2664	3107308 speC	speC	3105042	131
TU-4008	REV	3108938	3110988	2050 MU-2665	3111057 yghD;yghE;yghF	yghF	3110115	115
TU-4009	REV	3111063	3111938	875 MU-2666	3111570 yghG	yghG	3111089	71
TU-4010	REV	3111063	3111938	875 MU-2666	3111770 yghG	yghG	3111089	271
TU-4011	REV	3111063	3111938	875 MU-2666	3111918 yghG	yghG	3111089	419
TU-4012	REV	3111565	3112374	809 MU-2667	pppA	pppA	3111565	
TU-4013	REV	3112388	3117338	4950 MU-2668	3117349 yghJ	yghJ	3112572	215
TU-4014	REV	3112388	3117338	4950 MU-2668	3117362 yghJ	yghJ	3112572	228
TU-4015	REV	3117788	3119238	1450 MU-2669	3119364 glcA	glcA	3117619	63
TU-4016	REV	3117788	3122838	5050 MU-2669;MU-2670	3122752 glcA;glcB;glcG	glcG	3121849	499
TU-4017	REV	3117788	3122838	5050 MU-2669;MU-2670	3122796 glcA;glcB;glcG	glcG	3121849	543
TU-4018	REV	3117788	3126138	8350 MU-2669;MU-2670;MU-2671	3126098 glcA;glcB;glcG;glcF;glcE;glcD	glcD	3124544	55
TU-4019	REV	3117788	3126138	8350 MU-2669;MU-2670;MU-2671	3126195 glcA;glcB;glcG;glcF;glcE;glcD	glcD	3124544	152
TU-4020	REV	3127065	3128165	1100 MU-2672	yghO	yghO	3127065	
TU-4021	REV	3129363	3131979	2616 MU-2673	yghQ;yghR;yghS	yghS	3131266	
TU-4022	REV	3132894	3134393	1499 MU-2674	pitB	pitB	3132894	
TU-4023	REV	3134713	3136613	1900 MU-2675	3136551 gsp	gsp	3134685	7
TU-4024	REV	3137838	3141188	3350 MU-2676	3141054 hybG;hybF;hybE;hybD;hybC	hybC	3139308	43
TU-4025	REV	3137838	3141188	3350 MU-2676	3141126 hybG;hybF;hybE;hybD;hybC	hybC	3139308	115
TU-4026	REV	3137838	3144413	6575 MU-2676;MU-2677	3144309 hybG;hybF;hybE;hybD;hybC;hybB;hybA;hybO	hybO	3143165	26
TU-4027	REV	3137838	3144413	6575 MU-2676;MU-2677	3144385 hybG;hybF;hybE;hybD;hybC;hybB;hybA;hybO	hybO	3143165	102
TU-4028	REV	3144438	3144763	325 MU-2678	3144780 yghW	yghW	3144472	21
TU-4029	REV	3144863	3145763	900 MU-2679	3145787 yghX	yghX	3144878	74
TU-4030	REV	3147013	3147488	475 MU-2680	3147518 yqhA	yqhA	3146999	25
TU-4031	REV	3148638	3150063	1425 MU-2681	3150038 exbD;exbB	exbB	3149272	32
TU-4032	REV	3151588	3153197	1609 MU-2682	3153212 yqhC	yqhC	3152284	-28
TU-4033	REV	3156072	3156172	100 MU-2683	NT			
TU-4034	REV	3156697	3159222	2525 MU-2684	3159202 ygiQ	ygiQ	3156949	34
TU-4035	REV	3159297	3160672	1375 MU-2685	3160708 ftsP	ftsP	3159279	17
TU-4036	REV	3159297	3160672	1375 MU-2685	3160864 ftsP	ftsP	3159279	173
TU-4037	REV	3160697	3161647	950 MU-2686	3161587 plsC	plsC	3160766	84
TU-4038	REV	3161697	3164024	2327 MU-2687	3164043 parC	parC	3161737	48
TU-4039	REV	3164324	3166574	2250 MU-2688	3166584 ygiS;ygiT;mqsR	mqsR	3166270	18
TU-4040	REV	3166799	3167749	950 MU-2689	3167731 ygiV;ygiW	ygiW	3167306	33
TU-4041	REV	3169901	3170233	332 MU-2690	ygiZ	ygiZ	3169901	
TU-4042	REV	3171477	3173627	2150 MU-2691	3173667 parE	parE	3171526	249

TU-4043	REV	3173652	3174952	1300 MU-2692	3174987 yqiA;cpdA	cpdA	3174028	132
TU-4044	REV	3174977	3175852	875 MU-2693	3176014 yqiB;nudF	nudF	3175303	82
TU-4045	REV	3179852	3180302	450 MU-2694	3180462 ygiD	ygiD	3179641	6
TU-4046	REV	3181327	3181602	275 MU-2695	3181662 NT			
TU-4047	REV	3181327	3181602	275 MU-2695	3181669 NT			
TU-4048	REV	3181327	3181602	275 MU-2695	3181678 NT			
TU-4049	REV	3181827	3182727	900 MU-2696	3182740 ribB;sroG	sroG	3182592	0
TU-4050	REV	3185202	3185427	225 MU-2697	NT			
TU-4051	REV	3189777	3190127	350 MU-2698	3189979 glgS	glgS	3189761	18
TU-4052	REV	3189777	3190127	350 MU-2698	3189986 glgS	glgS	3189761	25
TU-4053	REV	3189777	3190127	350 MU-2698	3189995 glgS	glgS	3189761	34
TU-4054	REV	3189777	3190127	350 MU-2698	3190002 glgS	glgS	3189761	41
TU-4055	REV	3189777	3190127	350 MU-2698	3190011 glgS	glgS	3189761	50
TU-4056	REV	3189777	3190127	350 MU-2698	3190024 glgS	glgS	3189761	63
TU-4057	REV	3190227	3190327	100 MU-2699	3190379 NT			
TU-4058	REV	3192677	3192927	250 MU-2700	3192887 rygD	rygD	3192745	0
TU-4059	REV	3193052	3193352	300 MU-2701	3193271 rygE	rygE	3193121	9
TU-4060	REV	3193402	3194852	1450 MU-2702	3194803 rfaE	rfaE	3193342	28
TU-4061	REV	3194877	3199027	4150 MU-2703	3199054 glnE;ygiF	ygiF	3197686	67
TU-4062	REV	3201252	3202202	950 MU-2704	3202205 bacA	bacA	3201332	52
TU-4063	REV	3201252	3202202	950 MU-2704	3202243 bacA	bacA	3201332	90
TU-4064	REV	3202252	3202627	375 MU-2705	3202659 folB	folB	3202243	48
TU-4065	REV	3203577	3204277	700 MU-2706	3204386 ttdR	ttdR	3203346	108
TU-4066	REV	3207427	3208552	1125 MU-2707	3208588 ygjD	ygjD	3207552	23
TU-4067	REV	3212777	3213602	825 MU-2708	3213518 mug	mug	3212989	23
TU-4068	REV	3212777	3213602	825 MU-2708	3213543 mug	mug	3212989	48
TU-4069	REV	3213777	3214527	750 MU-2709	3214559 yqjH	yqjH	3213749	46
TU-4070	REV	3215427	3217102	1675 MU-2710	3217140 aer	aer	3215578	42
TU-4071	REV	3218937	3219269	332 MU-2711	ygjH	ygjH	3218937	
TU-4072	REV	3231753	3232603	850 MU-2712	3232782 yggM;yggN	yggN	3232163	305
TU-4073	REV	3232753	3233903	1150 MU-2713	3233919 rlmG	rlmG	3232761	22
TU-4074	REV	3240395	3242920	2525 MU-2714	3242809 ygjV;uxaA;uxaC	uxaC	3241351	46
TU-4075	REV	3251399	3252274	875 MU-2715	3252264 yhaJ	yhaJ	3251340	28
TU-4076	REV	3253774	3255949	2175 MU-2716	3256371 yhaM;yhaO	yhaO	3254701	339
TU-4077	REV	3256307	3265087	8780 MU-2717	tdcG;tdcF;tdcE;tdcD;tdcC;tdcB;tdcA	tdcA	3264149	
TU-4078	REV	3267826	3268645	819 MU-2718	3268614 rnpB	rnpB	3268238	0
TU-4079	REV	3268695	3272045	3350 MU-2719	garK;garR;garL;garP	garP	3271595	
TU-4080	REV	3275695	3276695	1000 MU-2720	3276727 agaR	agaR	3275878	40
TU-4081	REV	3287196	3287921	725 MU-2721	3287928 NT			
TU-4082	REV	3290271	3291646	1375 MU-2722	yraL	yraL	3290497	
TU-4083	REV	3291996	3292496	500 MU-2723	3292525 NT			
TU-4084	REV	3295121	3296921	1800 MU-2724	3296934 yraQ;yraR	yraR	3296233	66
TU-4085	REV	3297521	3297971	450 MU-2725	3297958 yhbP	yhbP	3297494	21
TU-4086	REV	3298196	3299421	1225 MU-2726	3299323 yhbS;yhbT	yhbT	3298774	25
TU-4087	REV	3298196	3299421	1225 MU-2726	3299434 yhbS;yhbT	yhbT	3298774	136
TU-4088	REV	3302646	3303846	1200 MU-2727	3303882 mtr	mtr	3302595	43

TU-4089	REV	3303946	3306196	2250 MU-2728	3306034	deaD	deaD	3303993	152
TU-4090	REV	3306221	3307096	875 MU-2729	3307126	nlpI	nlpI	3306062	180
TU-4091	REV	3307121	3309346	2225 MU-2730	3309271	pnp	pnp	3307055	81
TU-4092	REV	3307121	3309346	2225 MU-2730	3309309	pnp	pnp	3307055	119
TU-4093	REV	3309446	3309796	350 MU-2731	3309768	rpsO	rpsO	3309437	62
TU-4094	REV	3309446	3309796	350 MU-2731	3309806	rpsO	rpsO	3309437	100
TU-4095	REV	3309446	3311196	1750 MU-2731;MU-2732	3311247	rpsO;truB;rbfA	rbfA	3310799	47
TU-4096	REV	3309446	3316071	6625 MU-2731;MU-2732;MU-2733	3316071	rpsO;truB;rbfA;infB;nusA;yhbC	yhbC	3315576	37
TU-4097	REV	3309446	3316071	6625 MU-2731;MU-2732;MU-2733	3316119	rpsO;truB;rbfA;infB;nusA;yhbC	yhbC	3315576	85
TU-4098	REV	3309446	3316071	6625 MU-2731;MU-2732;MU-2733	3316211	rpsO;truB;rbfA;infB;nusA;yhbC	yhbC	3315576	177
TU-4099	REV	3316121	3316396	275 MU-2734	3316311	metY	metY	3316235	0
TU-4100	REV	3316121	3316396	275 MU-2734	3316397	metY	metY	3316235	86
TU-4101	REV	3318010	3319635	1625 MU-2735		yhbX	yhbX	3318010	
TU-4102	REV	3320096	3320696	600 MU-2736	3320611	leuU;secG	secG	3320195	84
TU-4103	REV	3320746	3322296	1550 MU-2737	3322307	glmM	glmM	3320755	215
TU-4104	REV	3320746	3322296	1550 MU-2737	3322347	glmM	glmM	3320755	255
TU-4105	REV	3322321	3323596	1275 MU-2738	3323252	folP	folP	3322085	319
TU-4106	REV	3322321	3323596	1275 MU-2738	3323526	folP	folP	3322085	593
TU-4107	REV	3323621	3324996	1375 MU-2739	3325000	hflB	hflB	3323023	43
TU-4108	REV	3323621	3325721	2100 MU-2739;MU-2740	3325753	hflB;rrmJ	rrmJ	3325057	67
TU-4109	REV	3325746	3326871	1125 MU-2741	3326835	greA	greA	3326261	98
TU-4110	REV	3325746	3326871	1125 MU-2741	3326874	greA	greA	3326261	137
TU-4111	REV	3328196	3330046	1850 MU-2742	3330183	obgE	obgE	3328604	407
TU-4112	REV	3328196	3330796	2600 MU-2742;MU-2743	3330932	obgE;yhbE	yhbE	3329792	175
TU-4113	REV	3330871	3331621	750 MU-2744	3331479	rplU	rplU	3331162	6
TU-4114	REV	3330871	3331621	750 MU-2744	3331529	rplU	rplU	3331162	56
TU-4115	REV	3330871	3331621	750 MU-2744	3331538	rplU	rplU	3331162	65
TU-4116	REV	3333121	3334471	1350 MU-2745	3334539	murA	murA	3333257	23
TU-4117	REV	3333121	3334471	1350 MU-2745	3334577	murA	murA	3333257	61
TU-4118	REV	3334496	3334921	425 MU-2746	3334854	yrbA	yrbA	3334571	29
TU-4119	REV	3334946	3335896	950 MU-2747	3336077	yrbB;yrbC	yrbC	3335278	164
TU-4120	REV	3334946	3335896	950 MU-2747	3336084	yrbB;yrbC	yrbC	3335278	171
TU-4121	REV	3334946	3338247	3301 MU-2747;MU-2748	3338123	yrbB;yrbC;yrbD;yrbE;yrbF	yrbF	3337278	36
TU-4122	REV	3334946	3338247	3301 MU-2747;MU-2748	3338154	yrbB;yrbC;yrbD;yrbE;yrbF	yrbF	3337278	67
TU-4123	REV	3347272	3348654	1382 MU-2749	3348510	mtgA;elbB	elbB	3347828	29
TU-4124	REV	3347272	3348654	1382 MU-2749	3348532	mtgA;elbB	elbB	3347828	51
TU-4125	REV	3347272	3348654	1382 MU-2749	3348571	mtgA;elbB	elbB	3347828	90
TU-4126	REV	3348704	3351029	2325 MU-2750	3351071	arcB	arcB	3348711	24
TU-4127	REV	3351204	3352054	850 MU-2751	3352167	yhcC	yhcC	3351143	95
TU-4128	REV	3358804	3358879	75 MU-2752	3358901	NT			
TU-4129	REV	3363579	3364754	1175 MU-2753		insH	insH	3363724	
TU-4130	REV	3365729	3365754	25 MU-2754	3365791	NT			
TU-4131	REV	3367134	3371609	4475 MU-2755	3371642	yhcH;nanK;nanE;nanT;nanA	nanA	3370705	44
TU-4132	REV	3371734	3372509	775 MU-2756	3372540	nanR	nanR	3371720	29
TU-4133	REV	3374309	3375559	1250 MU-2757	3375467	sspB;sspA	sspA	3374804	25
TU-4134	REV	3374309	3375559	1250 MU-2757	3375504	sspB;sspA	sspA	3374804	62

TU-4135	REV	3374309	3375559	1250 MU-2757	3375587 sspB;sspA	sspA	3374804	145
TU-4136	REV	3375859	3376809	950 MU-2758	3376678 rpsI;rpIM	rpIM	3376245	5
TU-4137	REV	3375859	3376809	950 MU-2758	3376692 rpsI;rpIM	rpIM	3376245	19
TU-4138	REV	3375859	3376809	950 MU-2758	3376796 rpsI;rpIM	rpIM	3376245	123
TU-4139	REV	3375859	3376809	950 MU-2758	3376830 rpsI;rpIM	rpIM	3376245	157
TU-4140	REV	3376909	3378084	1175 MU-2759	3378033 yhcM	yhcM	3376892	14
TU-4141	REV	3376909	3378084	1175 MU-2759	3378078 yhcM	yhcM	3376892	59
TU-4142	REV	3381359	3382509	1150 MU-2760	3382316 mdh	mdh	3381352	26
TU-4143	REV	3381359	3382509	1150 MU-2760	3382336 mdh	mdh	3381352	46
TU-4144	REV	3381359	3382509	1150 MU-2760	3382494 mdh	mdh	3381352	204
TU-4145	REV	3383878	3384178	300 MU-2761	3384191 yhcO	yhcO	3383879	40
TU-4146	REV	3385178	3387453	2275 MU-2762	3387503 aaeB;aaeA;aaeX	aaeX	3387156	144
TU-4147	REV	3388578	3390578	2000 MU-2763	3390086 tldD	tldD	3388605	36
TU-4148	REV	3388578	3390578	2000 MU-2763	3390139 tldD	tldD	3388605	89
TU-4149	REV	3388578	3390578	2000 MU-2763	3390443 tldD	tldD	3388605	393
TU-4150	REV	3388578	3390578	2000 MU-2763	3390673 tldD	tldD	3388605	623
TU-4151	REV	3390628	3395978	5350 MU-2764	3395947 yhdP;rng	rng	3394348	130
TU-4152	REV	3390628	3395978	5350 MU-2764	3396009 yhdP;rng	rng	3394348	192
TU-4153	REV	3396003	3396528	525 MU-2765	3396618 yhdE	yhdE	3395807	218
TU-4154	REV	3396003	3396528	525 MU-2765	3396643 yhdE	yhdE	3395807	243
TU-4155	REV	3396553	3399378	2825 MU-2766	3399149 mreD;mreC;mreB	mreB	3398066	40
TU-4156	REV	3396553	3399378	2825 MU-2766	3399214 mreD;mreC;mreB	mreB	3398066	105
TU-4157	REV	3399453	3401403	1950 MU-2767	3401381 csrD	csrD	3399414	27
TU-4158	REV	3408156	3408256	100 MU-2768	3408239 NT			
TU-4159	REV	3410825	3411487	662 MU-2769	envR	envR	3410825	
TU-4160	REV	3421432	3427207	5775 MU-2770	3427033 rrfF;thrV;rrfD;rrlD;alaU;ileU;rrsD	rrsD	3425243	249
TU-4161	REV	3421432	3427207	5775 MU-2770	3427071 rrfF;thrV;rrfD;rrlD;alaU;ileU;rrsD	rrsD	3425243	287
TU-4162	REV	3427757	3429032	1275 MU-2771	3429107 yrdB;aroE	aroE	3428042	247
TU-4163	REV	3427757	3430032	2275 MU-2771;MU-2772	3430049 yrdB;aroE;rimN;yrdD	yrdD	3429442	65
TU-4164	REV	3430057	3430707	650 MU-2773	3430625 smg	smg	3430013	139
TU-4165	REV	3430757	3431632	875 MU-2774	3431625 smf	smf	3430458	43
TU-4166	REV	3436082	3437532	1450 MU-2775	3437566 yhdL;zntR;yhdN	yhdN	3437163	35
TU-4167	REV	3437647	3441122	3475 MU-2776	3440574 rplQ;rpoA;rpsD;rpsK;rpsM	rpsM	3440137	81
TU-4168	REV	3437647	3441122	3475 MU-2776	3440580 rplQ;rpoA;rpsD;rpsK;rpsM	rpsM	3440137	87
TU-4169	REV	3437647	3441122	3475 MU-2776	3440584 rplQ;rpoA;rpsD;rpsK;rpsM	rpsM	3440137	91
TU-4170	REV	3437647	3441122	3475 MU-2776	3440615 rplQ;rpoA;rpsD;rpsK;rpsM	rpsM	3440137	122
TU-4171	REV	3437647	3441122	3475 MU-2776	3440622 rplQ;rpoA;rpsD;rpsK;rpsM	rpsM	3440137	129
TU-4172	REV	3437647	3441122	3475 MU-2776	3440636 rplQ;rpoA;rpsD;rpsK;rpsM	rpsM	3440137	143
TU-4173	REV	3441147	3446347	5200 MU-2777	3446318 rpmJ;secY;rplO;rpmD;rpsE;rplR;rplF;rpsH;rp sN;rplE;rplX;rplN	rplN	3445800	147
TU-4174	REV	3441147	3446347	5200 MU-2777	3446323 rpmJ;secY;rplO;rpmD;rpsE;rplR;rplF;rpsH;rp sN;rplE;rplX;rplN	rplN	3445800	152
TU-4175	REV	3441147	3446347	5200 MU-2777	3446364 rpmJ;secY;rplO;rpmD;rpsE;rplR;rplF;rpsH;rp sN;rplE;rplX;rplN	rplN	3445800	193
TU-4176	REV	3446372	3451497	5125 MU-2778	3451312 rpsQ;rpmC;rplP;rpsC;rplV;rpsS;rplB;rplW;rpl D;rplC;rpsJ	rpsJ	3450981	20

TU-4177	REV	3451547	3452172	625 MU-2779	3451985 gspB	gspB	3451530	36
TU-4178	REV	3451547	3453420	1873 MU-2779;MU-2780	gspB;gspA	gspA	3451951	
TU-4179	REV	3463847	3464747	900 MU-2781	3464770 bfr	bfr	3464271	23
TU-4180	REV	3464797	3464997	200 MU-2782	3465032 bfd	bfd	3464819	19
TU-4181	REV	3465297	3467372	2075 MU-2783	chiA	chiA	3465182	
TU-4182	REV	3468172	3469522	1350 MU-2784	3469359 tufA	tufA	3468167	8
TU-4183	REV	3468172	3469522	1350 MU-2784	3469402 tufA	tufA	3468167	51
TU-4184	REV	3468172	3469522	1350 MU-2784	3469412 tufA	tufA	3468167	61
TU-4185	REV	3468172	3469522	1350 MU-2784	3469419 tufA	tufA	3468167	68
TU-4186	REV	3468172	3469522	1350 MU-2784	3469443 tufA	tufA	3468167	92
TU-4187	REV	3469547	3472824	3277 MU-2785	3472640 fusA;rpsG;rpsL	rpsL	3472200	66
TU-4188	REV	3469547	3472824	3277 MU-2785	3472650 fusA;rpsG;rpsL	rpsL	3472200	76
TU-4189	REV	3472849	3474574	1725 MU-2786	3474466 yheL;yheM;yheN;yheO	yheO	3473740	4
TU-4190	REV	3472849	3474574	1725 MU-2786	3474524 yheL;yheM;yheN;yheO	yheO	3473740	62
TU-4191	REV	3472849	3474574	1725 MU-2786	3474563 yheL;yheM;yheN;yheO	yheO	3473740	101
TU-4192	REV	3474649	3475524	875 MU-2787	3475488 fkpA	fkpA	3474629	47
TU-4193	REV	3474649	3475524	875 MU-2787	3475547 fkpA	fkpA	3474629	106
TU-4194	REV	3475874	3476449	575 MU-2788	3476403 slyD	slyD	3475929	-116
TU-4195	REV	3475874	3476449	575 MU-2788	3476580 slyD	slyD	3475929	61
TU-4196	REV	3476474	3479249	2775 MU-2789	3479273 yheV;kefB;kefG	kefG	3478629	90
TU-4197	REV	3483074	3483849	775 MU-2790	3483867 yhfA	yhfA	3483436	27
TU-4198	REV	3483074	3483849	775 MU-2790	3483974 yhfA	yhfA	3483436	134
TU-4199	REV	3486799	3488224	1425 MU-2791	3488232 argD	argD	3486982	30
TU-4200	REV	3486799	3488224	1425 MU-2791	3488243 argD	argD	3486982	41
TU-4201	REV	3488274	3489649	1375 MU-2792	3489670 pabA;fic;yhfG	yhfG	3489475	28
TU-4202	REV	3489774	3490424	650 MU-2793	3490351 ppiA	ppiA	3489747	32
TU-4203	REV	3489774	3490424	650 MU-2793	3490357 ppiA	ppiA	3489747	38
TU-4204	REV	3490474	3490624	150 MU-2794	3490712 NT			
TU-4205	REV	3502987	3510362	7375 MU-2795	3510372 yhfS;yhfT;yhfU;php;yhfW;yhfX;yhfY;yhfZ	yhfZ	3509461	6
TU-4206	REV	3502987	3510362	7375 MU-2795	3510389 yhfS;yhfT;yhfU;php;yhfW;yhfX;yhfY;yhfZ	yhfZ	3509461	23
TU-4207	REV	3510612	3511687	1075 MU-2796	3511720 trpS	trpS	3510656	60
TU-4208	REV	3510612	3511687	1075 MU-2796	3511773 trpS	trpS	3510656	113
TU-4209	REV	3510612	3513287	2675 MU-2796;MU-2797	3513213 trpS;gph;rpe	rpe	3512404	132
TU-4210	REV	3510612	3514137	3525 MU-2796;MU-2797;MU-2798	3514323 trpS;gph;rpe;dam	dam	3513099	388
TU-4211	REV	3510612	3515637	5025 MU-2796;MU-2797;MU-2798;MU-2799	3515537 trpS;gph;rpe;dam;damX	damX	3514042	209
TU-4212	REV	3510612	3517387	6775 MU-2796;MU-2797;MU-2798;MU-2799;MU-2800	3517188 trpS;gph;rpe;dam;damX;aroB;aroK	aroK	3516565	102
TU-4213	REV	3510612	3517387	6775 MU-2796;MU-2797;MU-2798;MU-2799;MU-2800	3517403 trpS;gph;rpe;dam;damX;aroB;aroK	aroK	3516565	317
TU-4214	REV	3517712	3520837	3125 MU-2801	3520825 hofQ;hofP;hofO;hofN;hofM	hofM	3519994	52
TU-4215	REV	3523537	3524212	675 MU-2802	3524195 nudE	nudE	3523611	24
TU-4216	REV	3523537	3524212	675 MU-2802	3524254 nudE	nudE	3523611	83
TU-4217	REV	3523537	3524212	675 MU-2802	3524265 nudE	nudE	3523611	94
TU-4218	REV	3528762	3530612	1850 MU-2803	3530485 yhgE	yhgE	3528737	24
TU-4219	REV	3528762	3530612	1850 MU-2803	3530543 yhgE	yhgE	3528737	82

TU-4220	REV	3532563	3534738	2175 MU-2804	3534707 envZ;ompR	ompR	3533887	101
TU-4221	REV	3532563	3534738	2175 MU-2804	3534729 envZ;ompR	ompR	3533887	123
TU-4222	REV	3532563	3534738	2175 MU-2804	3534768 envZ;ompR	ompR	3533887	162
TU-4223	REV	3537863	3538013	150 MU-2805	NT			
TU-4224	REV	3537863	3538013	150 MU-2805	NT			
TU-4225	REV	3542213	3542863	650 MU-2806	3542897 bioH	bioH	3542096	31
TU-4226	REV	3546013	3550613	4600 MU-2807	3550532 malQ;malP	malP	3548102	37
TU-4227	REV	3553863	3556239	2376 MU-2808	3556144 rtcA;rtcB	rtcB	3554875	43
TU-4228	REV	3553863	3556239	2376 MU-2808	3556160 rtcA;rtcB	rtcB	3554875	59
TU-4229	REV	3553863	3556239	2376 MU-2808	3556197 rtcA;rtcB	rtcB	3554875	96
TU-4230	REV	3553863	3556239	2376 MU-2808	3556202 rtcA;rtcB	rtcB	3554875	101
TU-4231	REV	3557864	3558914	1050 MU-2809	3558752 glpR	glpR	3557870	124
TU-4232	REV	3557864	3558914	1050 MU-2809	3558903 glpR	glpR	3557870	275
TU-4233	REV	3557864	3559889	2025 MU-2809;MU-2810	3559883 glpR;glpG;glpE	glpE	3559520	37
TU-4234	REV	3561489	3561989	500 MU-2811	yzgL	yzgL	3561747	
TU-4235	REV	3562089	3566522	4433 MU-2812	3566419 glgP;glgA	glgA	3564623	363
TU-4236	REV	3562089	3567522	5433 MU-2812;MU-2813	3567411 glgP;glgA;glgC	glgC	3566056	60
TU-4237	REV	3562089	3567522	5433 MU-2812;MU-2813	3567480 glgP;glgA;glgC	glgC	3566056	129
TU-4238	REV	3562089	3567522	5433 MU-2812;MU-2813	3567595 glgP;glgA;glgC	glgC	3566056	244
TU-4239	REV	3562089	3571622	9533 MU-2812;MU-2813;MU-2814	3571644 glgP;glgA;glgC;glgX;glgB	glgB	3569339	119
TU-4240	REV	3562089	3571622	9533 MU-2812;MU-2813;MU-2814	3571787 glgP;glgA;glgC;glgX;glgB	glgB	3569339	262
TU-4241	REV	3562089	3571622	9533 MU-2812;MU-2813;MU-2814	3571792 glgP;glgA;glgC;glgX;glgB	glgB	3569339	267
TU-4242	REV	3571647	3572997	1350 MU-2815	3572903 asd	asd	3571798	2
TU-4243	REV	3574147	3575622	1475 MU-2816	3574307 gntU;gntK	gntK	3575088	-1308
TU-4244	REV	3575697	3576922	1225 MU-2817	3576961 gntR	gntR	3575754	212
TU-4245	REV	3577022	3578897	1875 MU-2818	3578831 yhhW;yhhX	yhhX	3577791	3
TU-4246	REV	3577022	3578897	1875 MU-2818	3578852 yhhW;yhhX	yhhX	3577791	24
TU-4247	REV	3578972	3579022	50 MU-2819	3579039 ryhB	ryhB	3578950	0
TU-4248	REV	3581495	3582320	825 MU-2820	3582323 NT			
TU-4249	REV	3583195	3584845	1650 MU-2821	3584877 ggt	ggt	3583104	31
TU-4250	REV	3583195	3584845	1650 MU-2821	3585024 ggt	ggt	3583104	178
TU-4251	REV	3585520	3590420	4900 MU-2822	3590437 ugpQ;ugpC;ugpE;ugpA;ugpB	ugpB	3589032	89
TU-4252	REV	3585520	3590420	4900 MU-2822	3590449 ugpQ;ugpC;ugpE;ugpA;ugpB	ugpB	3589032	101
TU-4253	REV	3590520	3595749	5229 MU-2823	3595627 livF;livG;livM;livH;livK	livK	3594474	44
TU-4254	REV	3590520	3595749	5229 MU-2823	3595638 livF;livG;livM;livH;livK	livK	3594474	55
TU-4255	REV	3590520	3595749	5229 MU-2823	3595744 livF;livG;livM;livH;livK	livK	3594474	161
TU-4256	REV	3590520	3595749	5229 MU-2823	3595769 livF;livG;livM;livH;livK	livK	3594474	186
TU-4257	REV	3596274	3597774	1500 MU-2824	3597715 livJ	livJ	3596578	34
TU-4258	REV	3596274	3597774	1500 MU-2824	3597785 livJ	livJ	3596578	104
TU-4259	REV	3597949	3599049	1100 MU-2825	3598820 rpoH	rpoH	3597952	14
TU-4260	REV	3597949	3599049	1100 MU-2825	3598872 rpoH	rpoH	3597952	66
TU-4261	REV	3597949	3599049	1100 MU-2825	3598886 rpoH	rpoH	3597952	80
TU-4262	REV	3597949	3599049	1100 MU-2825	3598893 rpoH	rpoH	3597952	87
TU-4263	REV	3597949	3599049	1100 MU-2825	3599027 rpoH	rpoH	3597952	221
TU-4264	REV	3597949	3599049	1100 MU-2825	3599187 rpoH	rpoH	3597952	381
TU-4265	REV	3599099	3602349	3250 MU-2826	3602333 ftsX;ftsE;ftsY	ftsY	3600773	67

TU-4266	REV	3599099	3602349	3250 MU-2826	3602339	ftsX;ftsE;ftsY	ftsY	3600773	73
TU-4267	REV	3602974	3603624	650 MU-2827		yhhM	yhhM	3603274	
TU-4268	REV	3606649	3607224	575 MU-2828	3607043	sirA	sirA	3606774	24
TU-4269	REV	3608574	3609749	1175 MU-2829	3609782	yhhS	yhhS	3608539	26
TU-4270	REV	3616824	3617149	325 MU-2830	3617170	NT			
TU-4271	REV	3616824	3617149	325 MU-2830	3617187	NT			
TU-4272	REV	3623349	3628924	5575 MU-2831	3628862	yhhJ;rbbA;yhiI	yhiI	3627558	237
TU-4273	REV	3623349	3628924	5575 MU-2831	3628952	yhhJ;rbbA;yhiI	yhiI	3627558	327
TU-4274	REV	3628991	3630613	1622 MU-2832		yhiJ	yhiJ	3628991	
TU-4275	REV	3630875	3632481	1606 MU-2833		yhiL	yhiL	3630875	
TU-4276	REV	3633674	3635499	1825 MU-2834	3635522	yhiN	yhiN	3634231	89
TU-4277	REV	3636999	3637849	850 MU-2835	3637869	uspB	uspB	3637408	126
TU-4278	REV	3638649	3638699	50 MU-2836	3638759	NT			
TU-4279	REV	3640374	3643249	2875 MU-2837	3643224	yhiQ;prlC	prlC	3641163	19
TU-4280	REV	3640374	3643249	2875 MU-2837	3643261	yhiQ;prlC	prlC	3641163	56
TU-4281	REV	3640374	3643249	2875 MU-2837	3643272	yhiQ;prlC	prlC	3641163	67
TU-4282	REV	3645749	3645974	225 MU-2838	3646005	dinQ	dinQ	3645728	149
TU-4283	REV	3647235	3647935	700 MU-2839		NT			
TU-4284	REV	3650060	3651235	1175 MU-2840	3651291	insH	insH	3650205	70
TU-4285	REV	3650060	3651235	1175 MU-2840	3651336	insH	insH	3650205	115
TU-4286	REV	3652960	3654810	1850 MU-2841	3654784	yhiD;hdeB;hdeA	hdeA	3654431	21
TU-4287	REV	3652960	3654810	1850 MU-2841	3654793	yhiD;hdeB;hdeA	hdeA	3654431	30
TU-4288	REV	3652960	3654810	1850 MU-2841	3654803	yhiD;hdeB;hdeA	hdeA	3654431	40
TU-4289	REV	3652960	3654810	1850 MU-2841	3654807	yhiD;hdeB;hdeA	hdeA	3654431	44
TU-4290	REV	3652960	3654810	1850 MU-2841	3654814	yhiD;hdeB;hdeA	hdeA	3654431	51
TU-4291	REV	3655860	3656035	175 MU-2842	3656051	NT			
TU-4292	REV	3655860	3656035	175 MU-2842	3656077	NT			
TU-4293	REV	3661935	3662860	925 MU-2843	3662689	gadW	gadW	3661913	48
TU-4294	REV	3662885	3663835	950 MU-2844	3663855	gadX	gadX	3663009	22
TU-4295	REV	3662885	3663835	950 MU-2844	3663864	gadX	gadX	3663009	31
TU-4296	REV	3663960	3665610	1650 MU-2845	3665631	gadA	gadA	3664203	28
TU-4297	REV	3666010	3667260	1250 MU-2846	3667288	yhjA	yhjA	3665814	77
TU-4298	REV	3669315	3669917	602 MU-2847		yhjB	yhjB	3669315	
TU-4299	REV	3674315	3676390	2075 MU-2848	3676403	yhjG	yhjG	3674313	15
TU-4300	REV	3676740	3677090	350 MU-2849	3677219	yhjH	yhjH	3676443	9
TU-4301	REV	3676740	3677090	350 MU-2849	3677250	yhjH	yhjH	3676443	40
TU-4302	REV	3678490	3679915	1425 MU-2850	3680034	yhjJ	yhjJ	3678467	71
TU-4303	REV	3679940	3681565	1625 MU-2851	3681519	dctA	dctA	3680184	49
TU-4304	REV	3679940	3681565	1625 MU-2851	3681683	dctA	dctA	3680184	213
TU-4305	REV	3681690	3684065	2375 MU-2852	3684213	yhjK	yhjK	3681653	605
TU-4306	REV	3681690	3684065	2375 MU-2852	3684223	yhjK	yhjK	3681653	615
TU-4307	REV	3684090	3694391	10301 MU-2853	3694252	bcsC;bcsZ;bcsB;bcsA;yhjQ;yhjR	yhjR	3694020	44
TU-4308	REV	3684090	3694391	10301 MU-2853	3694337	bcsC;bcsZ;bcsB;bcsA;yhjQ;yhjR	yhjR	3694020	129
TU-4309	REV	3684090	3694391	10301 MU-2853	3694346	bcsC;bcsZ;bcsB;bcsA;yhjQ;yhjR	yhjR	3694020	138
TU-4310	REV	3684090	3694391	10301 MU-2853	3694361	bcsC;bcsZ;bcsB;bcsA;yhjQ;yhjR	yhjR	3694020	153
TU-4311	REV	3684090	3694391	10301 MU-2853	3694387	bcsC;bcsZ;bcsB;bcsA;yhjQ;yhjR	yhjR	3694020	179

TU-4312	REV	3697966	3698266	300 MU-2854	3698295 ldrD	ldrD	3698003	185
TU-4313	REV	3698516	3698566	50 MU-2855	3698620 NT			
TU-4314	REV	3699066	3705869	6803 MU-2856	3705731 dppF;dppD;dppC;dppB;dppA	dppA	3704121	3
TU-4315	REV	3699066	3705869	6803 MU-2856	3705750 dppF;dppD;dppC;dppB;dppA	dppA	3704121	22
TU-4316	REV	3699066	3705869	6803 MU-2856	3705826 dppF;dppD;dppC;dppB;dppA	dppA	3704121	98
TU-4317	REV	3699066	3705869	6803 MU-2856	3705893 dppF;dppD;dppC;dppB;dppA	dppA	3704121	165
TU-4318	REV	3706619	3706694	75 MU-2857	3706715 proK	proK	3706639	0
TU-4319	REV	3706844	3708569	1725 MU-2858	3708608 eptB	eptB	3706807	110
TU-4320	REV	3708822	3710030	1208 MU-2859	yhjX	yhjX	3708822	
TU-4321	REV	3710269	3711019	750 MU-2860	3711033 yhjY	yhjY	3710259	76
TU-4322	REV	3712019	3714494	2475 MU-2861	3714451 bisC	bisC	3712084	34
TU-4323	REV	3712019	3714494	2475 MU-2861	3714580 bisC	bisC	3712084	163
TU-4324	REV	3716369	3717094	725 MU-2862	yaF	yaF	3716357	
TU-4325	REV	3718471	3718655	184 MU-2863	hokA;mokA	mokA	3718471	
TU-4326	REV	3720069	3723369	3300 MU-2864	3723377 glyS;glyQ	glyQ	3722430	36
TU-4327	REV	3723544	3723844	300 MU-2865	3723815 ysaB	ysaB	3723436	80
TU-4328	REV	3724947	3725771	824 MU-2866	yaA;yaB	yaB	3725430	
TU-4329	REV	3725994	3728669	2675 MU-2867	3728830 xylB;xylA	xylA	3727466	42
TU-4330	REV	3730496	3730821	325 MU-2868	3730755 NT			
TU-4331	REV	3734246	3735276	1030 MU-2869	3735265 bax	bax	3734376	65
TU-4332	REV	3739226	3740526	1300 MU-2870	3740563 ysaA;yaJ	yaJ	3739707	8
TU-4333	REV	3748851	3749076	225 MU-2871	3749066 ysaC	ysaC	3748836	129
TU-4334	REV	3749251	3749726	475 MU-2872	3749762 yaT	yaT	3749151	-129
TU-4335	REV	3750986	3752451	1465 MU-2873	yaV;yaW	yaW	3752128	
TU-4336	REV	3752876	3754526	1650 MU-2874	3754558 aldB	aldB	3752996	24
TU-4337	REV	3752876	3754526	1650 MU-2874	3754659 aldB	aldB	3752996	125
TU-4338	REV	3754699	3755850	1151 MU-2875	yaY	yaY	3754699	
TU-4339	REV	3756127	3759277	3150 MU-2876	3759323 selB;selA	selA	3757881	51
TU-4340	REV	3759327	3759977	650 MU-2877	3760004 yibF	yibF	3759370	26
TU-4341	REV	3763852	3764077	225 MU-2878	3764114 NT			
TU-4342	REV	3765602	3765677	75 MU-2879	3765702 NT			
TU-4343	REV	3768477	3769802	1325 MU-2880	yibH;yibI	yibI	3769405	
TU-4344	REV	3773827	3774627	800 MU-2881	3774469 yibT	yibT	3774194	66
TU-4345	REV	3779677	3780602	925 MU-2882	3780704 cysE	cysE	3779764	119
TU-4346	REV	3780627	3782177	1550 MU-2883	3782183 gpsA;secB	secB	3781684	32
TU-4347	REV	3780627	3782577	1950 MU-2883;MU-2884	3782529 gpsA;secB;grxC	grxC	3782214	64
TU-4348	REV	3782602	3783052	450 MU-2885	3783077 yibN	yibN	3782607	39
TU-4349	REV	3787070	3788104	1034 MU-2886	yibD	yibD	3787070	
TU-4350	REV	3788352	3790602	2250 MU-2887	3790746 tdh;kbl	kbl	3789378	172
TU-4351	REV	3790827	3791802	975 MU-2888	3791734 htrL	htrL	3790849	28
TU-4352	REV	3794877	3797027	2150 MU-2889	3796838 waaU	waaU	3796262	-497
TU-4353	REV	3794877	3799054	4177 MU-2889;MU-2890	3799018 waaU;rfaZ;rfaY	rfaY	3798290	30
TU-4354	REV	3794877	3799054	4177 MU-2889;MU-2890	3799105 waaU;rfaZ;rfaY	rfaY	3798290	117
TU-4355	REV	3794877	3799054	4177 MU-2889;MU-2890	3799236 waaU;rfaZ;rfaY	rfaY	3798290	248
TU-4356	REV	3794877	3800404	5527 MU-2889;MU-2890;MU-2891	3800527 waaU;rfaZ;rfaY;rfaJ	rfaJ	3799006	505
TU-4357	REV	3794877	3800404	5527 MU-2889;MU-2890;MU-2891	3800542 waaU;rfaZ;rfaY;rfaJ	rfaJ	3799006	520



TU-4358	REV	3794877	3802454	7577 MU-2889;MU-2890;MU-2891;MU-2892	3802583 waaU;rfaZ;rfaY;rfaJ;rfaI;rfaB	rfaB	3801081	393
TU-4359	REV	3794877	3803756	8879 MU-2889;MU-2890;MU-2891;MU-2892;MU-2893	3803796 waaU;rfaZ;rfaY;rfaJ;rfaI;rfaB;rfaS;rfaP	rfaP	3803176	-177
TU-4360	REV	3794877	3804856	9979 MU-2889;MU-2890;MU-2891;MU-2892;MU-2893;MU-2894	3804755 waaU;rfaZ;rfaY;rfaJ;rfaI;rfaB;rfaS;rfaP;rfaG	rfaG	3803966	-335
TU-4361	REV	3794877	3806281	11404 MU-2889;MU-2890;MU-2891;MU-2892;MU-2893;MU-2894;MU-2895	3806260 waaU;rfaZ;rfaY;rfaJ;rfaI;rfaB;rfaS;rfaP;rfaG;rfaQ	rfaQ	3805087	139
TU-4362	REV	3808206	3809181	975 MU-2896	3809198 mutM	mutM	3808366	23
TU-4363	REV	3809281	3810006	725 MU-2897	3809827 rpmG;rpmB	rpmB	3809461	130
TU-4364	REV	3809281	3810006	725 MU-2897	3809987 rpmG;rpmB	rpmB	3809461	290
TU-4365	REV	3809914	3810582	668 MU-2898	yicR	yicR	3809914	
TU-4366	REV	3813456	3814581	1125 MU-2899	3814579 pyrE;rph	rph	3813886	7
TU-4367	REV	3817511	3819193	1682 MU-2900	ligB	ligB	3817511	
TU-4368	REV	3825231	3826856	1625 MU-2901	3826724 gltS	gltS	3825483	36
TU-4369	REV	3825231	3826856	1625 MU-2901	3826788 gltS	gltS	3825483	100
TU-4370	REV	3830242	3833952	3710 MU-2902	yicI;yicJ	yicJ	3832570	
TU-4371	REV	3836631	3838081	1450 MU-2903	3838039 nlpA	nlpA	3837198	23
TU-4372	REV	3838572	3839762	1190 MU-2904	3839794 nepI	nepI	3838572	32
TU-4373	REV	3839973	3841812	1839 MU-2905	yicN;yicO	yicO	3840478	
TU-4374	REV	3843806	3843981	175 MU-2906	NT			
TU-4375	REV	3843799	3845190	1391 MU-2907	uhpT	uhpT	3843799	
TU-4376	REV	3845306	3850806	5500 MU-2908	3850893 uhpC;uhpB;uhpA;ilvN;ilvB	ilvB	3849119	86
TU-4377	REV	3850831	3851033	202 MU-2909	3851039 ivbL	ivbL	3850913	28
TU-4378	REV	3851141	3851280	139 MU-2910	3851215 istR	istR	3851141	-65
TU-4379	REV	3851141	3851280	139 MU-2910	3851280 istR	istR	3851141	0
TU-4380	REV	3853608	3854408	800 MU-2911	3854408 yidF;yidG;yidH	yidH	3853983	78
TU-4381	REV	3853608	3854408	800 MU-2911	3854437 yidF;yidG;yidH	yidH	3853983	107
TU-4382	REV	3854934	3858139	3205 MU-2912	yidJ;yidK	yidK	3856424	
TU-4383	REV	3859196	3861626	2430 MU-2913	glvG;glvC	glvC	3860010	
TU-4384	REV	3862658	3864333	1675 MU-2914	yidE	yidE	3862635	
TU-4385	REV	3864483	3865008	525 MU-2915	3865000 ibpB	ibpB	3864492	80
TU-4386	REV	3864483	3865008	525 MU-2915	3865032 ibpB	ibpB	3864492	112
TU-4387	REV	3864483	3865708	1225 MU-2915;MU-2916	3865541 ibpB;ibpA	ibpA	3865032	96
TU-4388	REV	3866508	3867283	775 MU-2917	3867318 yidR	yidR	3866085	19
TU-4389	REV	3870268	3873318	3050 MU-2918	3873209 dgoT;dgoD;dgoA;dgoK;dgoR	dgoR	3872494	26
TU-4390	REV	3874168	3874968	800 MU-2919	3875000 yidA	yidA	3874163	25
TU-4391	REV	3874168	3875493	1325 MU-2919;MU-2920	3875526 yidA;yidB	yidB	3875090	38
TU-4392	REV	3875618	3878271	2653 MU-2921	3878175 gyrB	gyrB	3875728	33
TU-4393	REV	3878296	3879721	1425 MU-2922	3879914 recF	recF	3878171	670
TU-4394	REV	3879746	3881971	2225 MU-2923	3881901 dnaN;dnaA	dnaA	3880349	149
TU-4395	REV	3891497	3891822	325 MU-2924	3891867 NT			
TU-4396	REV	3893297	3894647	1350 MU-2925	3894662 yieG	yieG	3893295	30
TU-4397	REV	3896694	3898600	1906 MU-2926	yieK;yieL	yieL	3897431	
TU-4398	REV	3896694	3900243	3549 MU-2927	yieK;yieL;bglH	bglH	3898627	
TU-4399	REV	3900312	3904590	4278 MU-2928	bglB;bglF;bglG	bglG	3903754	

TU-4400	REV	3904873	3909582	4709 MU-2929	3909724 phoU;pstB;pstA;pstC;pstS	pstS	3908508	176
TU-4401	REV	3909882	3913357	3475 MU-2930	3913244 glmS;glmU	glmU	3911853	21
TU-4402	REV	3909882	3913357	3475 MU-2930	3913348 glmS;glmU	glmU	3911853	125
TU-4403	REV	3913582	3920707	7125 MU-2931	3920513 atpC;atpD;atpG;atpA;atpH;atpF;atpE;atpB;a tpI	atpI	3920083	50
TU-4404	REV	3921007	3923732	2725 MU-2932	3923686 gidB;mnmG	mnmG	3921767	30
TU-4405	REV	3921007	3923732	2725 MU-2932	3923702 gidB;mnmG	mnmG	3921767	46
TU-4406	REV	3923807	3924532	725 MU-2933	3924499 mioC	mioC	3924035	21
TU-4407	REV	3924632	3925007	375 MU-2934	3925053 asnC	asnC	3924568	27
TU-4408	REV	3926132	3927682	1550 MU-2935	3927702 viaA	viaA	3926175	76
TU-4409	REV	3926132	3927682	1550 MU-2935	3927781 viaA	viaA	3926175	155
TU-4410	REV	3926132	3929157	3025 MU-2935;MU-2936	3929153 viaA;ravA	ravA	3927620	37
TU-4411	REV	3938057	3939432	1375 MU-2937	3939377 hsrA;yieP	yieP	3938658	27
TU-4412	REV	3945088	3946063	975 MU-2938	3946015 hdfR	hdfR	3945151	25
TU-4413	REV	3946472	3947992	1520 MU-2939	yifB	yifB	3946472	
TU-4414	REV	3954632	3955961	1329 MU-2940	3955895 ilvY	ilvY	3954950	52
TU-4415	REV	3957586	3957911	325 MU-2941	3957862 ppiC	ppiC	3957555	26
TU-4416	REV	3958036	3958486	450 MU-2942	3958493 yifN	yifN	3958035	10
TU-4417	REV	3960761	3963736	2975 MU-2943	3963691 gpp;rhIB	rhIB	3962388	38
TU-4418	REV	3982537	3983937	1400 MU-2944	3984114 aslA	aslA	3982375	84
TU-4419	REV	3984737	3987412	2675 MU-2945	3987236 hemY;hemX	hemX	3985908	147
TU-4420	REV	3984737	3987412	2675 MU-2945	3987493 hemY;hemX	hemX	3985908	404
TU-4421	REV	3984737	3988937	4200 MU-2945;MU-2946	3988812 hemY;hemX;hemD;hemC	hemC	3987848	23
TU-4422	REV	3991490	3992115	625 MU-2947	3992106 cyaY	cyaY	3991762	24
TU-4423	REV	3998315	3999079	764 MU-2948	yigE	yigE	3998315	
TU-4424	REV	4000442	4001216	774 MU-2949	yigF;yigG	yigG	4000836	
TU-4425	REV	4001315	4002715	1400 MU-2950	4002748 rarD;yigI	yigI	4002253	28
TU-4426	REV	4006340	4007065	725 MU-2951	4007109 rhtB	rhtB	4006462	27
TU-4427	REV	4009240	4010940	1700 MU-2952	4010878 metR	metR	4009886	39
TU-4428	REV	4013290	4014340	1050 MU-2953	4014216 ysgA	ysgA	4013377	24
TU-4429	REV	4022365	4023065	700 MU-2954	4022866 rfaH	rfaH	4022356	22
TU-4430	REV	4025315	4029017	3702 MU-2955	4029036 fadA;fadB	fadB	4026805	42
TU-4431	REV	4038920	4040120	1200 MU-2956	4040165 mobB;mobA	mobA	4039438	143
TU-4432	REV	4043881	4044581	700 MU-2957	4044649 yihG	yihG	4043693	24
TU-4433	REV	4048056	4048806	750 MU-2958	4048811 yihA	yihA	4048156	23
TU-4434	REV	4048056	4048806	750 MU-2958	4048817 yihA	yihA	4048156	29
TU-4435	REV	4051406	4051831	425 MU-2959	4051800 NT			
TU-4436	REV	4051881	4054356	2475 MU-2960	glnG;glnL	glnL	4053313	
TU-4437	REV	4051881	4056206	4325 MU-2960;MU-2961	4056075 glnG;glnL;glnA	glnA	4054648	18
TU-4438	REV	4051881	4056206	4325 MU-2960;MU-2961	4056101 glnG;glnL;glnA	glnA	4054648	44
TU-4439	REV	4051881	4056206	4325 MU-2960;MU-2961	4056109 glnG;glnL;glnA	glnA	4054648	52
TU-4440	REV	4051881	4056206	4325 MU-2960;MU-2961	4056129 glnG;glnL;glnA	glnA	4054648	72
TU-4441	REV	4061626	4062318	692 MU-2962	ompL	ompL	4061626	
TU-4442	REV	4062386	4067299	4913 MU-2963	yihO;yihP;yihQ	yihQ	4065263	
TU-4443	REV	4067498	4068424	926 MU-2964	yihR	yihR	4067498	
TU-4444	REV	4068538	4071594	3056 MU-2965	yihS;yihT;yihU	yihU	4070698	

TU-4445	REV	4078433	4079383	950 MU-2966	4079332 fdhE	fdhE	4078322	81
TU-4446	REV	4078433	4079383	950 MU-2966	4079351 fdhE	fdhE	4078322	100
TU-4447	REV	4078433	4079383	950 MU-2966	4079384 fdhE	fdhE	4078322	133
TU-4448	REV	4079433	4083958	4525 MU-2967	4083953 fdoI;fdoH;fdoG	fdoG	4080795	108
TU-4449	REV	4079433	4083958	4525 MU-2967	4083987 fdoI;fdoH;fdoG	fdoG	4080795	142
TU-4450	REV	4086130	4090846	4716 MU-2968	frvR;frvX;frvB;frvA	frvA	4090400	
TU-4451	REV	4091147	4095471	4324 MU-2969	rhaM;rhaD;rhaA;rhaB	rhaB	4094002	
TU-4452	REV	4096970	4098720	1750 MU-2970	4098605 rhaT	rhaT	4097514	57
TU-4453	REV	4096970	4098720	1750 MU-2970	4098760 rhaT	rhaT	4097514	212
TU-4454	REV	4100395	4100770	375 MU-2971	4100760 NT			
TU-4455	REV	4101570	4104045	2475 MU-2972	4103708 cpxA;cpxR	cpxR	4102995	15
TU-4456	REV	4101570	4104045	2475 MU-2972	4103751 cpxA;cpxR	cpxR	4102995	58
TU-4457	REV	4108798	4109698	900 MU-2973	4109564 tpiA	tpiA	4108763	34
TU-4458	REV	4108798	4109698	900 MU-2973	4109592 tpiA	tpiA	4108763	62
TU-4459	REV	4108798	4109698	900 MU-2973	4109598 tpiA	tpiA	4108763	68
TU-4460	REV	4109748	4110223	475 MU-2974	4110260 yiiQ	yiiQ	4109638	23
TU-4461	REV	4111648	4112523	875 MU-2975	4112520 fpr	fpr	4111749	25
TU-4462	REV	4112623	4113598	975 MU-2976	4113626 glpX	glpX	4112592	24
TU-4463	REV	4113998	4115748	1750 MU-2977	glpK;glpF	glpF	4115268	
TU-4464	REV	4116898	4117398	500 MU-2978	4117379 rraA	rraA	4116868	26
TU-4465	REV	4117448	4118398	950 MU-2979	4118424 menA	menA	4117446	52
TU-4466	REV	4117448	4118398	950 MU-2979	4118430 menA	menA	4117446	58
TU-4467	REV	4118448	4120323	1875 MU-2980	4120333 hslU;hslV	hslV	4119780	23
TU-4468	REV	4118448	4120323	1875 MU-2980	4120371 hslU;hslV	hslV	4119780	61
TU-4469	REV	4120373	4121123	750 MU-2981	ftsN	ftsN	4120403	
TU-4470	REV	4121148	4122523	1375 MU-2982	4122533 cytR	cytR	4121454	54
TU-4471	REV	4122673	4124898	2225 MU-2983	4124857 priA	priA	4122635	24
TU-4472	REV	4125298	4126548	1250 MU-2984	4126446 yiiX;metJ	metJ	4126101	28
TU-4473	REV	4125298	4126548	1250 MU-2984	4126488 yiiX;metJ	metJ	4126101	70
TU-4474	REV	4125298	4126548	1250 MU-2984	4126552 yiiX;metJ	metJ	4126101	134
TU-4475	REV	4131373	4131773	400 MU-2985	4131790 NT			
TU-4476	REV	4135063	4135680	617 MU-2986	yijF	yijF	4135063	
TU-4477	REV	4136123	4140223	4100 MU-2987	gldA;fsaB;ptsA	ptsA	4137743	
TU-4478	REV	4145673	4146323	650 MU-2988	4146619 yijO	yijO	4145489	279
TU-4479	REV	4145673	4148323	2650 MU-2988;MU-2989	4148374 yijO;yijP	yijP	4146555	86
TU-4480	REV	4148473	4151273	2800 MU-2990	4151210 ppc	ppc	4148470	89
TU-4481	REV	4151373	4153198	1825 MU-2991	4152919 argE	argE	4151719	49
TU-4482	REV	4151373	4153198	1825 MU-2991	4153098 argE	argE	4151719	228
TU-4483	REV	4156348	4156398	50 MU-2992	4156365 oxyS	oxyS	4156308	-52
TU-4484	REV	4157273	4158810	1537 MU-2993	4158845 sthA	sthA	4157413	32
TU-4485	REV	4159885	4161285	1400 MU-2994	4161318 trmA	trmA	4160193	25
TU-4486	REV	4164310	4164560	250 MU-2995	NT			
TU-4487	REV	4172110	4173110	1000 MU-2996	4173130 coaA	coaA	4172099	81
TU-4488	REV	4188399	4188599	200 MU-2997	4188551 sroH	sroH	4188350	41
TU-4489	REV	4188649	4194324	5675 MU-2998	4194323 thiH;thiG;thiS;thiF;thiE;thiC	thiC	4192227	201
TU-4490	REV	4188649	4194324	5675 MU-2998	4194398 thiH;thiG;thiS;thiF;thiE;thiC	thiC	4192227	276

TU-4491	REV	4194349	4194949	600 MU-2999	4194882	rsd	rsd	4194355	51
TU-4492	REV	4194349	4194949	600 MU-2999	4194977	rsd	rsd	4194355	146
TU-4493	REV	4199249	4199699	450 MU-3000	4199735	zraP	zraP	4199286	24
TU-4494	REV	4202624	4205574	2950 MU-3001	4205593	purD;purH	purH	4203966	38
TU-4495	REV	4211302	4212102	800 MU-3002	4212165	yjaB	yjaB	4211703	19
TU-4496	REV	4218324	4220510	2186 MU-3003		arpA	arpA	4218324	
TU-4497	REV	4220832	4221657	825 MU-3004	4221675	iclR	iclR	4220827	24
TU-4498	REV	4227707	4228157	450 MU-3005	4228191	pepE	pepE	4227476	26
TU-4499	REV	4229258	4229708	450 MU-3006	4229722	pagB	pagB	4229382	68
TU-4500	REV	4229733	4231533	1800 MU-3007	4231560	lysC	lysC	4229907	304
TU-4501	REV	4237783	4238158	375 MU-3008	4238277	yjbT	yjbT	4237800	199
TU-4502	REV	4238802	4240277	1475 MU-3009		xylE	xylE	4238802	
TU-4503	REV	4240958	4244459	3501 MU-3010	4244488	malG;malF;malE	malE	4243252	46
TU-4504	REV	4252059	4254642	2583 MU-3011	4254658	plsB	plsB	4252066	169
TU-4505	REV	4257492	4258042	550 MU-3012	4258054	zur	zur	4257511	28
TU-4506	REV	4261292	4262292	1000 MU-3013	4262317	qor	qor	4261271	63
TU-4507	REV	4261292	4262292	1000 MU-3013	4262327	qor	qor	4261271	73
TU-4508	REV	4266832	4267035	203 MU-3014		yjbS	yjbS	4266832	
TU-4509	REV	4269167	4271942	2775 MU-3015	4271914	uvrA	uvrA	4269072	20
TU-4510	REV	4272817	4273167	350 MU-3016	4273158	yjcB	yjcB	4272783	94
TU-4511	REV	4275067	4275417	350 MU-3017	4275432	soxS	soxS	4275083	26
TU-4512	REV	4275067	4275417	350 MU-3017	4275446	soxS	soxS	4275083	40
TU-4513	REV	4275942	4276092	150 MU-3018	4276089	ryjA	ryjA	4275950	0
TU-4514	REV	4279806	4281098	1292 MU-3019		yjcF	yjcF	4279806	
TU-4515	REV	4281292	4285393	4101 MU-3020	4285413	actP;yjcH;acs	acs	4283436	19
TU-4516	REV	4293868	4295143	1275 MU-3021	4295172	yjcO	yjcO	4294459	24
TU-4517	REV	4295368	4297493	2125 MU-3022	4297441	fdhF	fdhF	4295242	52
TU-4518	REV	4297587	4302426	4839 MU-3023		mdtP;mdtO;mdtN;yticA	yticA	4302151	
TU-4519	REV	4302635	4304620	1985 MU-3024		yjcS	yjcS	4302635	
TU-4520	REV	4304893	4309003	4110 MU-3025		alsK;alsE;alsC;alsA	alsA	4307471	
TU-4521	REV	4310194	4311019	825 MU-3026	4311039	alsB;rpiR	rpiR	4310124	25
TU-4522	REV	4312369	4313694	1325 MU-3027	4313646	phnP;phnO	phnO	4313127	85
TU-4523	REV	4312369	4323188	10819 MU-3027;MU-3028		phnP;phnO;phnN;phnM;phnL;phnK;phnJ;phnI;phnH;phnG;phnF;phnE;phnD;phnC	phnC	4322400	
TU-4524	REV	4323319	4323769	450 MU-3029	4323744	yjdN	yjdN	4323321	-20
TU-4525	REV	4323319	4323769	450 MU-3029	4323789	yjdN	yjdN	4323321	25
TU-4526	REV	4323844	4324819	975 MU-3030	4324818	yjdM	yjdM	4324422	61
TU-4527	REV	4330294	4332269	1975 MU-3031	4332070	basS;basR	basR	4331305	97
TU-4528	REV	4331970	4333613	1643 MU-3032		eptA	eptA	4331970	
TU-4529	REV	4333717	4335952	2235 MU-3033		adiC;adiY	adiY	4335191	
TU-4530	REV	4336277	4338547	2270 MU-3034		adiA	adiA	4336277	
TU-4531	REV	4338769	4339644	875 MU-3035	4339673	melR	melR	4338743	22
TU-4532	REV	4342994	4347069	4075 MU-3036	4347112	yjdF;fumB;dcuB	dcuB	4345427	345
TU-4533	REV	4347298	4348573	1275 MU-3037	4348570	dcuR	dcuR	4347338	513
TU-4534	REV	4347298	4349723	2425 MU-3037;MU-3038	4349711	dcuR;dcuS	dcuS	4348054	26
TU-4535	REV	4351248	4352848	1600 MU-3039	4352820	lysU	lysU	4351223	80

TU-4536	REV	4352973	4353898	925 MU-3040	4353810 yjdL	yjdL	4352977	-624
TU-4537	REV	4354493	4358054	3561 MU-3041	cadA;cadB	cadB	4356720	
TU-4538	REV	4358419	4359957	1538 MU-3042	4359983 cadC	cadC	4358419	26
TU-4539	REV	4360214	4360376	162 MU-3043	yjdQ	yjdQ	4360214	
TU-4540	REV	4360574	4360649	75 MU-3044	pheU	pheU	4360574	
TU-4541	REV	4360674	4361249	575 MU-3045	4361353 yjdC	yjdC	4360756	22
TU-4542	REV	4361274	4363574	2300 MU-3046	4363567 dipZ;cutA	cutA	4363041	188
TU-4543	REV	4363624	4364849	1225 MU-3047	4364954 dcuA	dcuA	4363495	158
TU-4544	REV	4364899	4366424	1525 MU-3048	4366481 aspA	aspA	4364914	131
TU-4545	REV	4364899	4366424	1525 MU-3048	4366576 aspA	aspA	4364914	226
TU-4546	REV	4367249	4368449	1200 MU-3049	4368478 yjeH	yjeH	4367179	43
TU-4547	REV	4371388	4372257	869 MU-3050	4372334 yjeJ	yjeJ	4371388	77
TU-4548	REV	4372649	4373774	1125 MU-3051	4373707 yjeK	yjeK	4372652	27
TU-4549	REV	4372649	4373774	1125 MU-3051	4373723 yjeK	yjeK	4372652	43
TU-4550	REV	4375024	4375749	725 MU-3052	4375769 blc	blc	4375212	24
TU-4551	REV	4375999	4376974	975 MU-3053	4377026 ampC	ampC	4375834	59
TU-4552	REV	4377074	4380424	3350 MU-3054	4380421 frdD;frdC;frdB;frdA	frdA	4378533	80
TU-4553	REV	4377074	4380424	3350 MU-3054	4380437 frdD;frdC;frdB;frdA	frdA	4378533	96
TU-4554	REV	4383999	4388449	4450 MU-3055	4388446 yjeP;psd	psd	4387415	63
TU-4555	REV	4388474	4389575	1101 MU-3056	4389612 rsgA	rsgA	4388480	80
TU-4556	REV	4391077	4392077	1000 MU-3057	4392071 yjeS	yjeS	4390951	-19
TU-4557	REV	4413870	4414895	1025 MU-3058	4414787 yjfN;yjfO	yjfO	4414464	-6
TU-4558	REV	4415695	4416470	775 MU-3059	4416493 ulaR	ulaR	4415721	17
TU-4559	REV	4415695	4416470	775 MU-3059	4416505 ulaR	ulaR	4415721	29
TU-4560	REV	4416745	4417595	850 MU-3060	4417675 ulaG	ulaG	4416584	27
TU-4561	REV	4416745	4417595	850 MU-3060	4417700 ulaG	ulaG	4416584	52
TU-4562	REV	4422495	4422845	350 MU-3061	4422866 yjfY	yjfY	4422539	52
TU-4563	REV	4424651	4425445	794 MU-3062	4425738 yjfZ	yjfZ	4424651	293
TU-4564	REV	4426070	4426820	750 MU-3063	4426842 ytfB	ytfB	4426102	102
TU-4565	REV	4427395	4427695	300 MU-3064	4427737 NT			
TU-4566	REV	4427395	4427695	300 MU-3064	4427775 NT			
TU-4567	REV	4429445	4429995	550 MU-3065	4430032 ytfE	ytfE	4429344	26
TU-4568	REV	4430114	4431088	974 MU-3066	4431075 ytfF	ytfF	4430114	-13
TU-4569	REV	4430114	4431088	974 MU-3066	4431141 ytfF	ytfF	4430114	53
TU-4570	REV	4430114	4431088	974 MU-3066	4431182 ytfF	ytfF	4430114	94
TU-4571	REV	4431245	4432045	800 MU-3067	4432075 ytfG	ytfG	4431187	28
TU-4572	REV	4432720	4434620	1900 MU-3068	4434652 cpdB	cpdB	4432645	64
TU-4573	REV	4436795	4437345	550 MU-3069	4437333 ytfJ	ytfJ	4436731	48
TU-4574	REV	4437896	4439397	1501 MU-3070	4439273 ytfL	ytfL	4437895	35
TU-4575	REV	4437896	4439397	1501 MU-3070	4439407 ytfL	ytfL	4437895	169
TU-4576	REV	4439472	4440272	800 MU-3071	4440285 msrA	msrA	4439561	86
TU-4577	REV	4447147	4447697	550 MU-3072	4447709 ppa	ppa	4447145	34
TU-4578	REV	4452647	4453772	1125 MU-3073	4453663 fbp	fbp	4452634	31
TU-4579	REV	4452647	4453772	1125 MU-3073	4453669 fbp	fbp	4452634	37
TU-4580	REV	4455147	4455947	800 MU-3074	4455910 yjgA	yjgA	4455337	22
TU-4581	REV	4458072	4460831	2759 MU-3075	4460853 nrdG;nrdD	nrdD	4458545	170

TU-4582	REV	4462881	4465331	2450 MU-3076	4465297 treC;treB;treR	treR	4464322	28
TU-4583	REV	4462881	4465331	2450 MU-3076	4465303 treC;treB;treR	treR	4464322	34
TU-4584	REV	4468460	4468935	475 MU-3077	4468967 yjgF	yjgF	4468550	31
TU-4585	REV	4468960	4470710	1750 MU-3078	4470574 pyrI;pyrB;pyrL	pyrL	4470422	18
TU-4586	REV	4470760	4471260	500 MU-3079	4471189 yjgH	yjgH	4470837	-43
TU-4587	REV	4471410	4472060	650 MU-3080	4472082 yjgI	yjgI	4471363	6
TU-4588	REV	4475235	4476335	1100 MU-3081	4476367 argI	argI	4475330	33
TU-4589	REV	4477085	4477560	475 MU-3082	4477592 yjgM	yjgM	4477057	32
TU-4590	REV	4479013	4481938	2925 MU-3083	4481941 valS	valS	4479005	81
TU-4591	REV	4479013	4481938	2925 MU-3083	4481950 valS	valS	4479005	90
TU-4592	REV	4481963	4482338	375 MU-3084	4482296 holC	holC	4481860	-7
TU-4593	REV	4482363	4484138	1775 MU-3085	4484124 pepA	pepA	4482463	150
TU-4594	REV	4482363	4484138	1775 MU-3085	4484133 pepA	pepA	4482463	159
TU-4595	REV	4482363	4484138	1775 MU-3085	4484159 pepA	pepA	4482463	185
TU-4596	REV	4486488	4488088	1600 MU-3086	4488106 yjgR	yjgR	4486584	20
TU-4597	REV	4488138	4489613	1475 MU-3087	4489571 idnR	idnR	4488164	409
TU-4598	REV	4488138	4489613	1475 MU-3087	4489668 idnR	idnR	4488164	506
TU-4599	REV	4489229	4492429	3200 MU-3088	idnT;idnO;idnD	idnD	4491398	
TU-4600	REV	4493338	4494238	900 MU-3089	4494256 yjgB	yjgB	4493213	24
TU-4601	REV	4497288	4497538	250 MU-3090	4497552 NT			
TU-4602	REV	4498063	4498513	450 MU-3091	4498527 NT			
TU-4603	REV	4497616	4498814	1198 MU-3092	yjgX	yjgX	4497616	
TU-4604	REV	4500163	4501438	1275 MU-3093	4501480 insG	insG	4500126	26
TU-4605	REV	4504713	4504888	175 MU-3094	4504927 yjhD	yjhD	4504649	48
TU-4606	REV	4505488	4506688	1200 MU-3095	4506740 insI	insI	4505489	100
TU-4607	REV	4506699	4506965	266 MU-3096	insM	insM	4506699	
TU-4608	REV	4508620	4512720	4100 MU-3097	4512624 fecE;fecD;fecC;fecB	fecB	4511429	293
TU-4609	REV	4512995	4516270	3275 MU-3098	4516274 fecA;fecR;fecI	fecI	4515737	16
TU-4610	REV	4512995	4516270	3275 MU-3098	4516286 fecA;fecR;fecI	fecI	4515737	28
TU-4611	REV	4516620	4518470	1850 MU-3099	4518437 yjhU	yjhU	4517361	90
TU-4612	REV	4518694	4520043	1349 MU-3100	yjhF	yjhF	4518694	
TU-4613	REV	4520150	4522117	1967 MU-3101	yjhG	yjhG	4520150	
TU-4614	REV	4522128	4523826	1698 MU-3102	yjhH;yjhI	yjhI	4523038	
TU-4615	REV	4524420	4525870	1450 MU-3103	4526043 sgcR;sgcE;sgcA	sgcA	4525572	40
TU-4616	REV	4525920	4529670	3750 MU-3104	4529709 sgcQ;sgcC;sgcB;sgcX	sgcX	4528553	35
TU-4617	REV	4529945	4530345	400 MU-3105	4530385 yjhY	yjhY	4530073	52
TU-4618	REV	4530445	4531920	1475 MU-3106	4531869 yjhP;yjhQ;yjhX	yjhX	4531819	-207
TU-4619	REV	4532453	4532698	245 MU-3107	yjhZ	yjhZ	4532453	
TU-4620	REV	4534637	4535617	980 MU-3108	yjhS	yjhS	4534637	
TU-4621	REV	4535645	4536895	1250 MU-3109	4536784 nanM	nanM	4535682	-4
TU-4622	REV	4536808	4537524	716 MU-3110	nanC	nanC	4536808	
TU-4623	REV	4547846	4549271	1425 MU-3111	4549357 gntP	gntP	4547976	38
TU-4624	REV	4553513	4554343	830 MU-3112	yjiC	yjiC	4553513	
TU-4625	REV	4555571	4556371	800 MU-3113	4556259 yjiE	yjiE	4555401	-53
TU-4626	REV	4555571	4556371	800 MU-3113	4556338 yjiE	yjiE	4555401	26
TU-4627	REV	4556396	4557646	1250 MU-3114	4557566 iadA	iadA	4556377	17

TU-4628	REV	4556396	4557646	1250 MU-3114	4557613 iadA	iadA	4556377	64
TU-4629	REV	4558121	4558872	751 MU-3115	4558769 yjiG;yjiH	yjiH	4558020	66
TU-4630	REV	4559772	4565198	5426 MU-3116	4565269 yjiJ;yjiK;yjiL;yjiM;yjiN	yjiN	4563989	0
TU-4631	REV	4565323	4566756	1433 MU-3117	4566662 mdtM	mdtM	4565310	120
TU-4632	REV	4565323	4566756	1433 MU-3117	4566790 mdtM	mdtM	4565310	248
TU-4633	REV	4568306	4569631	1325 MU-3118	4569656 yjiR	yjiR	4568185	59
TU-4634	REV	4576044	4577344	1300 MU-3119	4577384 mcrC;mcrB	mcrB	4575981	24
TU-4635	REV	4577570	4577845	275 MU-3120	4577938 symE	symE	4577522	75
TU-4636	REV	4578170	4581221	3051 MU-3121	4581252 hsdS;hsdM	hsdM	4579482	181
TU-4637	REV	4578170	4581221	3051 MU-3121	4581296 hsdS;hsdM	hsdM	4579482	225
TU-4638	REV	4578170	4581221	3051 MU-3121	4581329 hsdS;hsdM	hsdM	4579482	258
TU-4639	REV	4581271	4584849	3578 MU-3122	4584833 hsdR	hsdR	4581272	-5
TU-4640	REV	4585949	4587049	1100 MU-3123	4587083 yjiA;yjiX	yjiX	4586899	-19
TU-4641	REV	4587224	4589374	2150 MU-3124	4589376 yjiY	yjiY	4587152	74
TU-4642	REV	4591384	4592745	1361 MU-3125	yjjL	yjjL	4591384	
TU-4643	REV	4593224	4593899	675 MU-3126	4593888 yjjM	yjjM	4592960	14
TU-4644	REV	4595174	4597499	2325 MU-3127	4597516 mdoB	mdoB	4595173	52
TU-4645	REV	4597724	4599599	1875 MU-3128	4599580 yjjA;dnaC;dnaT	dnaT	4599001	40
TU-4646	REV	4597724	4599599	1875 MU-3128	4599620 yjjA;dnaC;dnaT	dnaT	4599001	80
TU-4647	REV	4600324	4600899	575 MU-3129	4600916 yjjB;yjjP	yjjP	4600111	35
TU-4648	REV	4602599	4603699	1100 MU-3130	4603716 fhuF	fhuF	4602898	30
TU-4649	REV	4604049	4604424	375 MU-3131	4604459 leuV;leuP;leuQ	leuQ	4604338	35
TU-4650	REV	4604624	4605724	1100 MU-3132	4605745 rsmC	rsmC	4604692	22
TU-4651	REV	4614049	4615099	1050 MU-3133	4615116 yjjW;yjjI	yjjI	4613538	28
TU-4652	REV	4621274	4622799	1525 MU-3134	4622833 lplA;ytjB	ytjB	4622168	21
TU-4653	REV	4626824	4628549	1725 MU-3135	4628586 yjjK	yjjK	4626878	41
TU-4654	REV	4631099	4631774	675 MU-3136	4631787 yjjX	yjjX	4631256	19
TU-4655	REV	4631099	4631774	675 MU-3136	4631795 yjjX	yjjX	4631256	27
TU-4656	REV	4632374	4633349	975 MU-3137	4633376 rob	rob	4632464	43
TU-4657	REV	4637618	4638693	1075 MU-3138	4638355 arcA	arcA	4637613	26
TU-4658	REV	4637618	4638693	1075 MU-3138	4638361 arcA	arcA	4637613	32
TU-4659	REV	4637618	4638693	1075 MU-3138	4638442 arcA	arcA	4637613	113
TU-4660	REV	4637618	4638693	1075 MU-3138	4638618 arcA	arcA	4637613	289
TU-4661	REV	4637618	4638693	1075 MU-3138	4638703 arcA	arcA	4637613	374