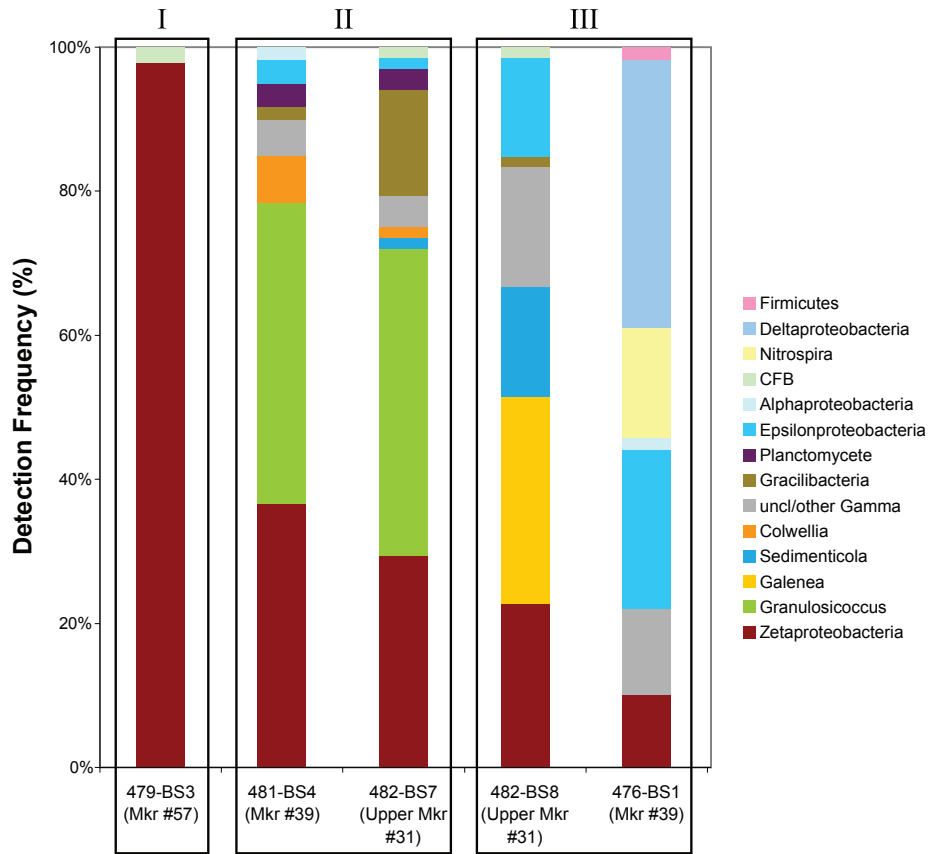
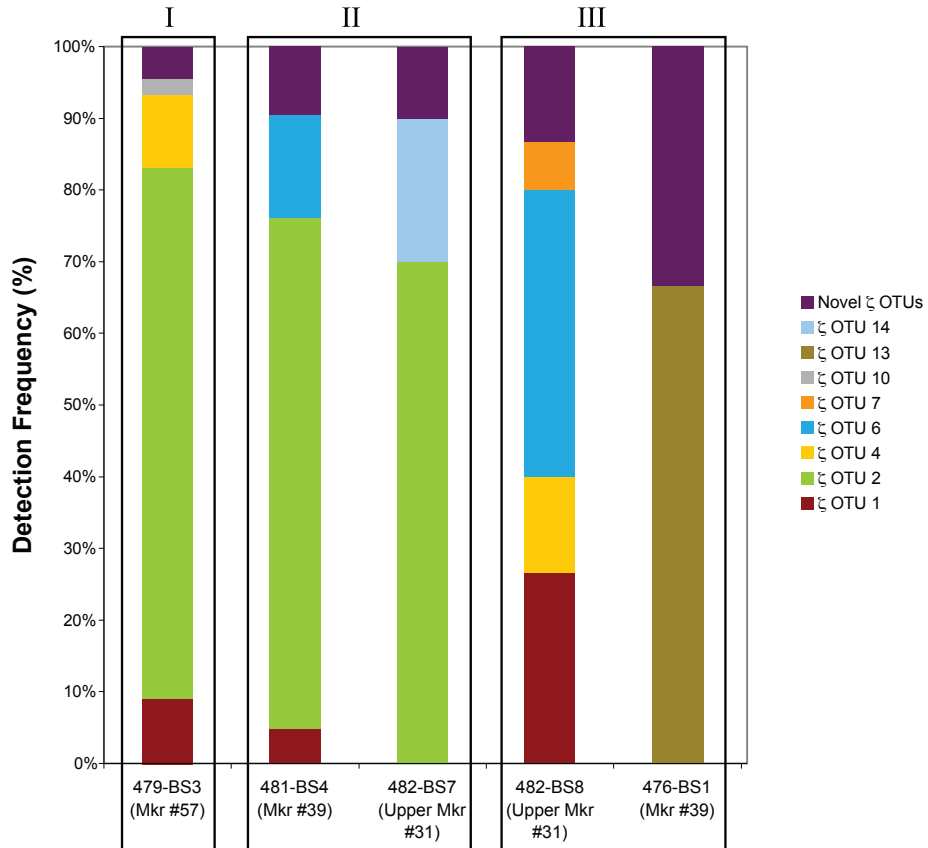


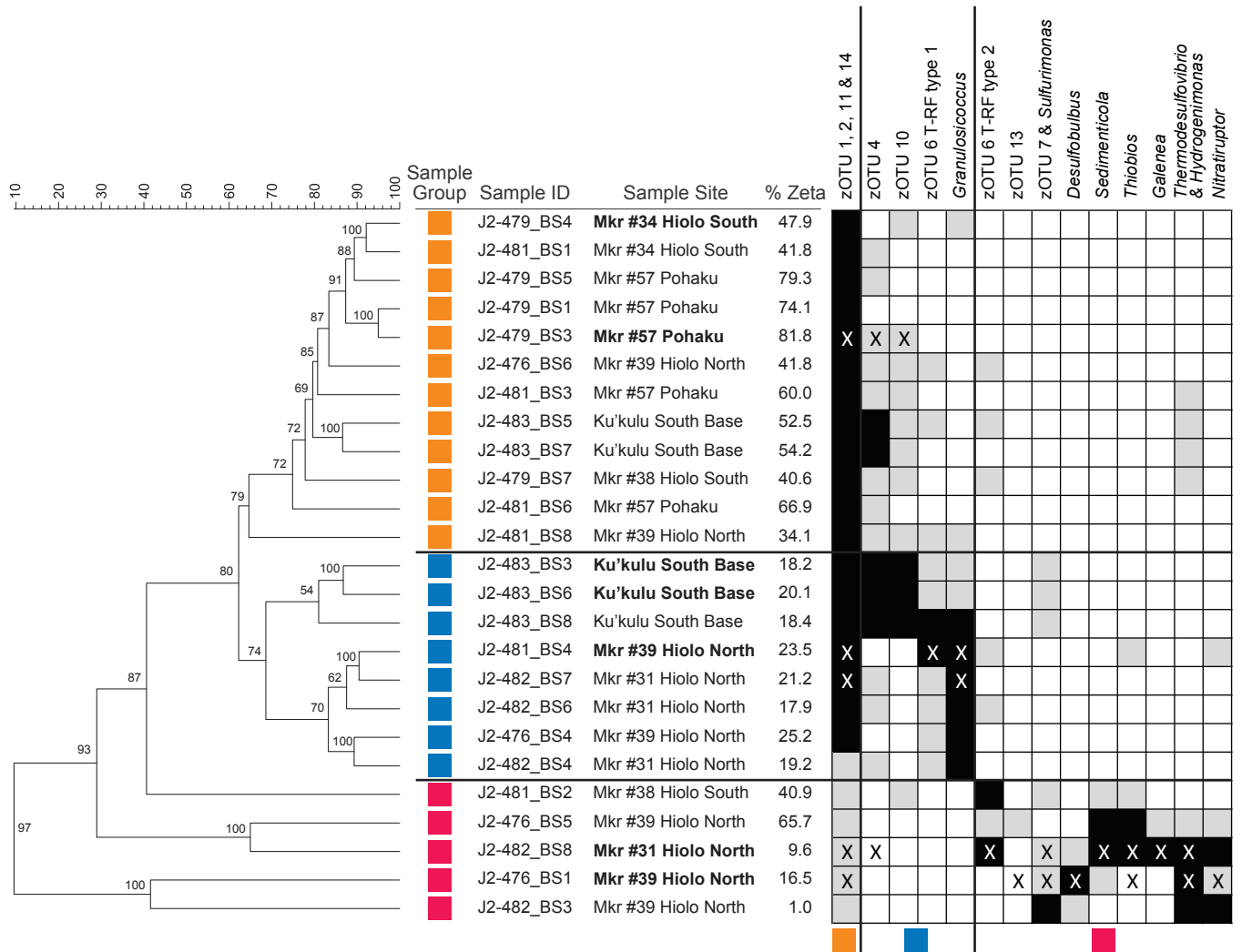
Bacterial Community



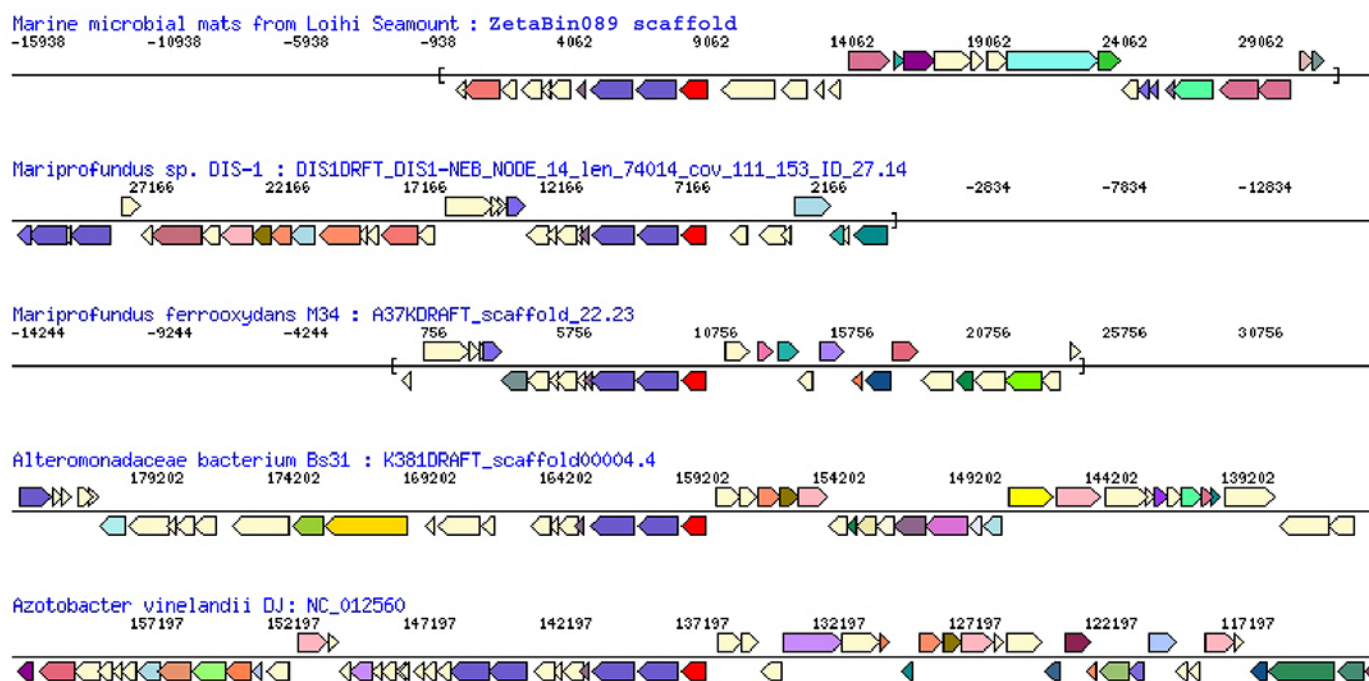
Zetaproteobacteria Only



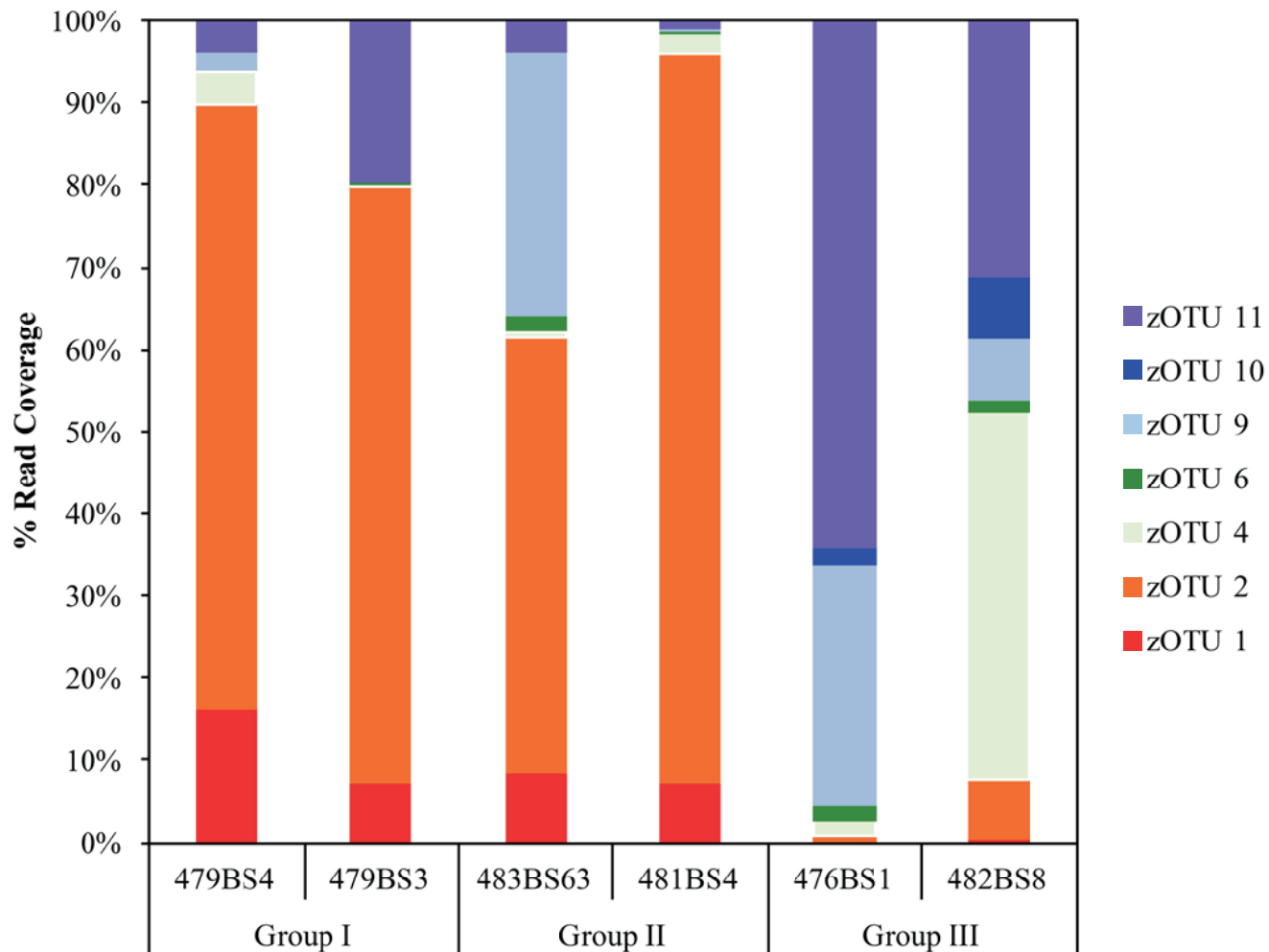
Supplemental Figure 1.



Supplemental Figure 2.



Supplemental Figure 3.



Supplemental Figure 4.

Supplemental Table 1. Read Statistics.

Sample Name	Cycles	Sequencer	Before Normalization	After Normalization
476-BS1	2 x 308	MiSeq	62,704,746	28,197,716
479-BS4	2 x 308	MiSeq	40,807,268	12,391,396
481-BS3	2 x 101	HiSeq	293,219,592	36,324,362
481-BS4	2 x 308	MiSeq	49,135,240	11,227,026
482-BS8	2 x 308	MiSeq	41,426,814	15,618,046
483-BS63	2 x 84	MiSeq	41,991,914	6,906,718

Supplemental Table 2. Genes identified as similar to *M. ferrooxydans* PV-1 *cyc1* (DAA64808.1).

Scaffold	Class	Genome Bin	Locus Tag	Gene Product Name
Ga0117756_1001273	Zetaproteobacteria	LoihiMaxBin_011	Ga0117756_100127326	Cytochrome c553/Cytochrome c553
Ga0117756_1000092	Zetaproteobacteria	LoihiMaxBin_040	Ga0117756_100009214	Cytochrome c553/Cytochrome c553
Ga0117756_1001286	Zetaproteobacteria	LoihiMaxBin_041	Ga0117756_100128619	Cytochrome c553/Cytochrome c553
Ga0117756_1002578	Zetaproteobacteria	LoihiMaxBin_042	Ga0117756_100257812	Cytochrome c553/Cytochrome c553
Ga0117756_1001746	Zetaproteobacteria	LoihiMaxBin_043	Ga0117756_100174666	Cytochrome c553/Cytochrome c553
Ga0117756_1028789	Zetaproteobacteria	LoihiMaxBin_047	Ga0117756_10287891	Cytochrome c553/Cytochrome c553
Ga0117756_1001836	Zetaproteobacteria	LoihiMaxBin_050	Ga0117756_100183621	Cytochrome c553/Cytochrome c553
Ga0117756_1051079	Zetaproteobacteria	LoihiMaxBin_055	Ga0117756_10510791	Cytochrome c553
Ga0117756_1038594	Zetaproteobacteria	LoihiMaxBin_056	Ga0117756_10385943	Cytochrome c553/Cytochrome c553
Ga0117756_1030170	Zetaproteobacteria	LoihiMaxBin_059	Ga0117756_10301701	Cytochrome c553
Ga0117756_1003929	Zetaproteobacteria	LoihiMaxBin_065	Ga0117756_100392910	Cytochrome c553/Cytochrome c553
Ga0117756_1058088	Zetaproteobacteria	LoihiMaxBin_065	Ga0117756_10580881	Cytochrome c553
Ga0117756_1000364	Zetaproteobacteria	LoihiMaxBin_066	Ga0117756_100036422	Cytochrome c553/Cytochrome c553
Ga0117756_1003301	Zetaproteobacteria	LoihiMaxBin_066	Ga0117756_10033016	thiosulfate dehydrogenase
Ga0117756_1006226	Zetaproteobacteria	LoihiMaxBin_077	Ga0117756_10062266	Cytochrome c553/Tetraheme cytochrome c subunit of nitrate or TMAO reductase
Ga0117756_1008594	Zetaproteobacteria	LoihiMaxBin_077	Ga0117756_10085946	Cytochrome c553/Cytochrome c553
Ga0117756_1001414	Zetaproteobacteria	LoihiMaxBin_079	Ga0117756_100141411	Cytochrome c553/Cytochrome c553
Ga0117756_1000939	Zetaproteobacteria	LoihiMaxBin_080	Ga0117756_100093923	thiosulfate dehydrogenase
Ga0117756_1040683	Zetaproteobacteria	LoihiMaxBin_084	Ga0117756_10406832	Cytochrome c553/Cytochrome c553
Ga0117756_1049104	Zetaproteobacteria	LoihiMaxBin_084	Ga0117756_10491041	Cytochrome c553/Cytochrome c553
Ga0117756_1000815	Zetaproteobacteria	LoihiMaxBin_088	Ga0117756_100081524	Cytochrome c553
Ga0117756_1003270	Zetaproteobacteria	LoihiMaxBin_088	Ga0117756_10032707	Cytochrome c553/Tetraheme cytochrome c subunit of nitrate or TMAO reductase
Ga0117756_1000031	Zetaproteobacteria	LoihiMaxBin_089	Ga0117756_100003124	Cytochrome c553/Cytochrome c553
Ga0117756_1017374	Zetaproteobacteria	LoihiMaxBin_091	Ga0117756_10173745	Cytochrome c553/Cytochrome c553

Supplemental Table 3. Genes identified as similar to *M. ferrooxydans* PV-1 *cyc2* (AKN35166.1).

Scaffold	Class	Genome Bin	Locus Tag	Gene Product Name
Ga0117756_1000082	Zetaproteobacteria	ZetaBin080	Ga0117756_100008262	hypothetical protein
Ga0117756_1000169	Zetaproteobacteria	ZetaBin035	Ga0117756_10001694	hypothetical protein
Ga0117756_1000281	Zetaproteobacteria	ZetaBin040	Ga0117756_100028141	hypothetical protein
Ga0117756_1000517	Zetaproteobacteria	ZetaBin042	Ga0117756_100051734	hypothetical protein
Ga0117756_1001027	Zetaproteobacteria	ZetaBin041	Ga0117756_10010279	hypothetical protein
Ga0117756_1001197	Zetaproteobacteria	ZetaBin066	Ga0117756_10011974	hypothetical protein
Ga0117756_1001197	Zetaproteobacteria	ZetaBin066	Ga0117756_10011973	hypothetical protein
Ga0117756_1001926	Zetaproteobacteria	ZetaBin035	Ga0117756_100192620	hypothetical protein
Ga0117756_1001926	Zetaproteobacteria	ZetaBin035	Ga0117756_100192618	hypothetical protein
Ga0117756_1002147	Zetaproteobacteria	ZetaBin043	Ga0117756_100214710	hypothetical protein
Ga0117756_1002914	Zetaproteobacteria	ZetaBin088	Ga0117756_10029141	hypothetical protein
Ga0117756_1003808	Zetaproteobacteria	ZetaBin089	Ga0117756_10038085	hypothetical protein
Ga0117756_1004200	Zetaproteobacteria	ZetaBin050	Ga0117756_10042008	hypothetical protein
Ga0117756_1005281	Zetaproteobacteria	ZetaBin050	Ga0117756_10052816	hypothetical protein
Ga0117756_1007026	Zetaproteobacteria	ZetaBin090	Ga0117756_10070261	hypothetical protein
Ga0117756_1007675	Zetaproteobacteria	ZetaBin011	Ga0117756_10076751	hypothetical protein
Ga0117756_1011041	Zetaproteobacteria	ZetaBin049	Ga0117756_10110416	hypothetical protein
Ga0117756_1012992	Zetaproteobacteria	ZetaBin049	Ga0117756_10129924	hypothetical protein
Ga0117756_1013610	Zetaproteobacteria	ZetaBin049	Ga0117756_10136104	hypothetical protein
Ga0117756_1013891	Zetaproteobacteria	ZetaBin049	Ga0117756_10138912	hypothetical protein
Ga0117756_1014268	Zetaproteobacteria	ZetaBin049	Ga0117756_10142681	hypothetical protein
Ga0117756_1016945	Zetaproteobacteria	ZetaBin065	Ga0117756_10169454	hypothetical protein
Ga0117756_1025359	Zetaproteobacteria	ZetaBin091	Ga0117756_10253592	hypothetical protein
Ga0117756_1028748	Zetaproteobacteria	ZetaBin088	Ga0117756_10287482	hypothetical protein
Ga0117756_1029363	Zetaproteobacteria	ZetaBin084	Ga0117756_10293631	hypothetical protein
Ga0117756_1029874	Zetaproteobacteria	ZetaBin035	Ga0117756_10298741	hypothetical protein
Ga0117756_1030386	Zetaproteobacteria	ZetaBin084	Ga0117756_10303861	hypothetical protein
Ga0117756_1031186	Zetaproteobacteria	ZetaBin084	Ga0117756_10311861	hypothetical protein
Ga0117756_1033024	Zetaproteobacteria	ZetaBin064	Ga0117756_10330242	hypothetical protein
Ga0117756_1034066	Zetaproteobacteria	ZetaBin062	Ga0117756_10340661	hypothetical protein
Ga0117756_1036278	Zetaproteobacteria	ZetaBin084	Ga0117756_10362781	hypothetical protein
Ga0117756_1038273	Zetaproteobacteria	ZetaBin059	Ga0117756_10382731	hypothetical protein
Ga0117756_1038911	Zetaproteobacteria	ZetaBin065	Ga0117756_10389111	hypothetical protein
Ga0117756_1041107	Zetaproteobacteria	ZetaBin069	Ga0117756_10411071	hypothetical protein
Ga0117756_1045285	Zetaproteobacteria	ZetaBin090	Ga0117756_10452851	hypothetical protein
Ga0117756_1047975	Zetaproteobacteria	ZetaBin011	Ga0117756_10479752	hypothetical protein
Ga0117756_1048244	Zetaproteobacteria	ZetaBin090	Ga0117756_10482441	hypothetical protein
Ga0117756_1051193	Zetaproteobacteria	ZetaBin089	Ga0117756_10511931	hypothetical protein
Ga0117756_1052798	Zetaproteobacteria	ZetaBin060	Ga0117756_10527981	hypothetical protein
Ga0117756_1053486	Zetaproteobacteria	ZetaBin084	Ga0117756_10534862	hypothetical protein
Ga0117756_1079919	Zetaproteobacteria	ZetaBin037	Ga0117756_10799191	hypothetical protein

Supplemental Table 4. Genes identified as similar to *M.ferrooxydans* PV-1 Mob (SPV1_03948).

Scaffold	Class	GenomeBin	Locus Tag	Gene Product Name
Ga0117756_1001425	Zetaproteobacteria	ZetaBin011	Ga0117756_100142513	NADH-quinone oxidoreductase subunit G
Ga0117756_1002014	Zetaproteobacteria	ZetaBin011	Ga0117756_100201417	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1003853	Zetaproteobacteria	ZetaBin011	Ga0117756_10038531	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1038481	Zetaproteobacteria	ZetaBin011	Ga0117756_10384811	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1018933	Zetaproteobacteria	ZetaBin037	Ga0117756_10189332	formate dehydrogenase major subunit
Ga0117756_1001039	Zetaproteobacteria	ZetaBin040	Ga0117756_100103913	assimilatory nitrate reductase catalytic subunit
Ga0117756_1003809	Zetaproteobacteria	ZetaBin040	Ga0117756_10038098	nitrate reductase NapA
Ga0117756_1001693	Zetaproteobacteria	ZetaBin043	Ga0117756_10016938	nitrate reductase NapA
Ga0117756_1003962	Zetaproteobacteria	ZetaBin047	Ga0117756_10039626	NADH-quinone oxidoreductase subunit G
Ga0117756_1021850	Zetaproteobacteria	ZetaBin047	Ga0117756_10218501	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1038467	Zetaproteobacteria	ZetaBin047	Ga0117756_10384673	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1052450	Zetaproteobacteria	ZetaBin049	Ga0117756_10524501	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1055985	Zetaproteobacteria	ZetaBin049	Ga0117756_10559851	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1001959	Zetaproteobacteria	ZetaBin050	Ga0117756_100195912	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1002724	Zetaproteobacteria	ZetaBin050	Ga0117756_10027244	NADH-quinone oxidoreductase subunit G
Ga0117756_1001247	Zetaproteobacteria	ZetaBin066	Ga0117756_100124739	prokaryotic molybdopterin-containing oxidoreductase family, iron-sulfur binding subunit
Ga0117756_1006226	Zetaproteobacteria	ZetaBin077	Ga0117756_10062265	Anaerobic selenocysteine-containing dehydrogenase
Ga0117756_1000082	Zetaproteobacteria	ZetaBin080	Ga0117756_10000828	NADH-quinone oxidoreductase subunit G
Ga0117756_1038571	Zetaproteobacteria	ZetaBin084	Ga0117756_10385712	formate dehydrogenase major subunit
Ga0117756_1003270	Zetaproteobacteria	ZetaBin088	Ga0117756_10032708	Anaerobic selenocysteine-containing dehydrogenase
Ga0117756_1007462	Zetaproteobacteria	ZetaBin089	Ga0117756_10074623	nitrate reductase NapA
Ga0117756_1038643	Zetaproteobacteria	ZetaBin089	Ga0117756_10386431	assimilatory nitrate reductase catalytic subunit
Ga0117756_1004180	Zetaproteobacteria	ZetaBin090	Ga0117756_10041807	nitrate reductase NapA
Ga0117756_1016962	Zetaproteobacteria	ZetaBin091	Ga0117756_10169623	assimilatory nitrate reductase catalytic subunit
Ga0117756_1004665	Zetaproteobacteria	ZetaBin092	Ga0117756_10046658	nitrate reductase NapA
Ga0117756_1021839	Zetaproteobacteria	ZetaBin092	Ga0117756_10218391	NADH-quinone oxidoreductase subunit G
Ga0117756_1023392	Zetaproteobacteria	ZetaBin092	Ga0117756_10233921	NADH-quinone oxidoreductase subunit G
Ga0117756_1051284	Zetaproteobacteria	ZetaBin092	Ga0117756_10512841	nitrate reductase NapA

Supplemental Table 5. The taxonomic placement and genome bins of the RubisCO Large Chain protein along with the closest BlastP database hit.

Scaffold	Locus Tag	Closest Blast hit	Type	pident	length	evalue	bitscore	Gene Name	Class	GenomeBin
Ga0117756_1036952	Ga0117756_10369521	gi 517099781 ref WP_018288599.1	II	89.7	468	0	884	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin091
Ga0117756_1006443	Ga0117756_10064431	gi 517092680 ref WP_018281498.1	II	97.9	388	0	793	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin089
Ga0117756_1009661	Ga0117756_10096614	gi 517092680 ref WP_018281498.1	II	96.1	76	2E-44	159	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin089
Ga0117756_1016164	Ga0117756_10161643	gi 517097112 ref WP_018285930.1	II	93.0	445	0	876	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin084
Ga0117756_1000143	Ga0117756_100014332	gi 517097112 ref WP_018285930.1	II	96.4	472	0	950	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin080
Ga0117756_1008592	Ga0117756_10085926	gi 517097112 ref WP_018285930.1	II	95.7	187	8E-129	382	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin079
Ga0117756_1017913	Ga0117756_10179133	gi 517097112 ref WP_018285930.1	II	95.9	170	2E-113	342	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin079
Ga0117756_1010223	Ga0117756_10102234	gi 517097112 ref WP_018285930.1	II	92.8	472	0	916	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin077
Ga0117756_1001224	Ga0117756_100122415	gi 497537089 ref WP_009851287.1	II	76.6	469	0	758	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin066
Ga0117756_1009325	Ga0117756_10093251	gi 517097112 ref WP_018285930.1	II	100.0	58	1E-29	117	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin065
Ga0117756_1025537	Ga0117756_10255372	gi 517099781 ref WP_018288599.1	II	91.5	472	0	902	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin065
Ga0117756_1045447	Ga0117756_10454471	gi 517097112 ref WP_018285930.1	II	95.5	201	7E-137	404	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin059
Ga0117756_1036909	Ga0117756_10369091	gi 517097112 ref WP_018285930.1	II	96.7	366	0	744	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin058
Ga0117756_1040564	Ga0117756_10405641	gi 517097112 ref WP_018285930.1	II	95.5	424	0	863	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin057
Ga0117756_1011633	Ga0117756_10116331	gi 517099781 ref WP_018288599.1	II	89.8	472	0	890	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin055
Ga0117756_1008234	Ga0117756_10082342	gi 659893037 ref WP_029939712.1	II	77.2	465	0	761	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin050
Ga0117756_1010010	Ga0117756_10100105	gi 657350008 ref WP_029406688.1	II	79.1	177	1E-93	291	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin050
Ga0117756_1010712	Ga0117756_10107121	gi 497537089 ref WP_009851287.1	II	83.4	151	2E-86	272	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin049
Ga0117756_1030307	Ga0117756_10303073	gi 659893037 ref WP_029939712.1	II	76.7	223	9E-121	363	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin047
Ga0117756_1039135	Ga0117756_10391352	gi 659893037 ref WP_029939712.1	II	77.9	199	2E-106	326	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin047
Ga0117756_1050695	Ga0117756_10506951	gi 659893037 ref WP_029939712.1	II	76.2	390	0	630	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin047
Ga0117756_1002262	Ga0117756_100226216	gi 517099781 ref WP_018288599.1	II	100.0	471	0	979	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin043
Ga0117756_1000102	Ga0117756_10001023	gi 517097112 ref WP_018285930.1	II	92.4	472	0	912	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin042
Ga0117756_1002917	Ga0117756_100291713	gi 517097112 ref WP_018285930.1	II	95.8	472	0	956	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin041
Ga0117756_1000051	Ga0117756_100005126	gi 517092680 ref WP_018281498.1	II	100.0	468	0	973	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin040
Ga0117756_1019077	Ga0117756_10190771	gi 517092680 ref WP_018281498.1	II	74.9	179	3E-89	280	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin037
Ga0117756_1003323	Ga0117756_10033234	gi 737402008 ref WP_035383183.1	II	92.3	470	0	905	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin035
Ga0117756_1022954	Ga0117756_10229541	gi 517099781 ref WP_018288599.1	II	92.7	385	0	757	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin022
Ga0117756_1050794	Ga0117756_10507941	gi 490178889 ref WP_004077508.1	I	65.9	82	2E-29	118	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin022
Ga0117756_1002975	Ga0117756_10029751	gi 659893037 ref WP_029939712.1	II	78.1	465	0	759	ribulose-bisphosphate carboxylase large chain	Zetaproteobacteria	ZetaBin011
Ga0117756_1137224	Ga0117756_11372241	gi 496642367 ref WP_011323101.1	III	57.1	133	4E-42	155	ribulose-bisphosphate carboxylase large chain	IMG=Alphaproteobacteria	unbinned
Ga0117756_1056354	Ga0117756_10563541	gi 517097112 ref WP_018285930.1	II	95.0	160	1E-107	327	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1067788	Ga0117756_10677881	gi 740417597 ref WP_038250565.1	II	87.8	302	0	563	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1070361	Ga0117756_10703611	gi 759380765 ref WP_043107373.1	II	98.6	293	0	603	ribulose-bisphosphate carboxylase large chain	IMG=Gammmaproteobacteria	unbinned
Ga0117756_1070520	Ga0117756_10705201	gi 517097112 ref WP_018285930.1	II	98.6	73	2E-40	148	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1077249	Ga0117756_10772491	gi 503057046 ref WP_013292022.1	II	74.9	227	2E-121	365	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1079512	Ga0117756_10795121	gi 740417597 ref WP_038250565.1	II	88.6	262	1E-173	499	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1083217	Ga0117756_10832171	gi 517097112 ref WP_018285930.1	II	100.0	249	0	522	ribulose-bisphosphate carboxylase large chain	IMG=Betaproteobacteria	unbinned
Ga0117756_1084274	Ga0117756_10842742	gi 517097112 ref WP_018285930.1	II	90.3	31	8E-10	61.6	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1084399	Ga0117756_10843991	gi 517099781 ref WP_018288599.1	II	92.8	249	2E-170	491	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1095397	Ga0117756_10953971	gi 759380765 ref WP_043107373.1	II	91.0	145	4E-90	281	ribulose-bisphosphate carboxylase large chain	IMG=Gammmaproteobacteria	unbinned
Ga0117756_1106676	Ga0117756_11066761	gi 517092680 ref WP_018281498.1	II	90.1	201	2E-131	389	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1110271	Ga0117756_11102711	gi 506245542 ref WP_015765417.1	II	91.8	195	9E-128	379	ribulose-bisphosphate carboxylase large chain	IMG=Gammmaproteobacteria	unbinned
Ga0117756_1111400	Ga0117756_11114001	gi 517092680 ref WP_018281498.1	II	74.7	142	5E-66	219	ribulose-bisphosphate carboxylase large chain	IMG=Gammmaproteobacteria	unbinned
Ga0117756_1114043	Ga0117756_11140431	gi 517097112 ref WP_018285930.1	II	91.1	190	5E-124	370	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1128243	Ga0117756_11282431	gi 517097112 ref WP_018285930.1	II	93.6	172	3E-114	345	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1144663	Ga0117756_11446631	gi 764556396 ref WP_044418808.1	II	89.6	154	2E-95	295	ribulose-bisphosphate carboxylase large chain	IMG=Alphaproteobacteria	unbinned
Ga0117756_1151383	Ga0117756_11513832	gi 502888301 ref WP_013123277.1	II	90.5	63	3E-32	125	ribulose-bisphosphate carboxylase large chain	IMG=Zetaproteobacteria	unbinned
Ga0117756_1085828	Ga0117756_10858281	gi 737267451 ref WP_035251360.1	I	87.9	58	2E-26	108	ribulose-bisphosphate carboxylase large chain	IMG=Alphaproteobacteria	unbinned
Ga0117756_1061759	Ga0117756_10617591	gi 518005896 ref WP_019176104.1	I	53.4	262	2E-82	265	ribulose-bisphosphate carboxylase large chain	IMG=Methanomicrobium	unbinned
Ga0117756_1076488	Ga0117756_10764882	gi 759380759 ref WP_043107369.1	I	100.0	37	4E-17	82.4	ribulose-bisphosphate carboxylase large chain	IMG=Gammmaproteobacteria	unbinned
Ga0117756_1083288	Ga0117756_10832881	gi 759380759 ref WP_043107369.1	I	99.5	198	4E-138	406	ribulose-bisphosphate carboxylase large chain	IMG=Gammmaproteobacteria	unbinned
Ga0117756_1152120	Ga0117756_11521201	gi 504020534 ref WP_014254528.1	-	66.9	151	2E-63	210	ribulose-bisphosphate carboxylase large chain	IMG=Methanomicrobium	unbinned
Ga0117756_1000071	Ga0117756_100007122	gi 924870411 ref WP_053549117.1	not rubisco	56.6	129	2E-46	160	ribulose-bisphosphate carboxylase large chain	Nitrospirae	NitroBin001
Ga0117756_1000235	Ga0117756_10002351	gi 504865161 ref WP_015052263.1	-	74.7	474	0	775	ribulose-bisphosphate carboxylase large chain	Unclassified Archaea	LoihiMaxBin001
Ga0117756_1000202	Ga0117756_100020230	gi 518331021 ref WP_019501228.1	I	67.7	464	0	656	ribulose-bisphosphate carboxylase large chain	Caldilineae	CaldiBin024
Ga0117756_1022958	Ga0117756_10229581	gi 506220048 ref WP_015739823.1	III	52.0	177	6E-51	180	ribulose-bisphosphate carboxylase large chain	Anaerolineae	AaeroBin020
Ga0117756_1015772	Ga0117756_10157722	gi 503448813 ref WP_013683474.1	III	55.3	423	1E-162	477	ribulose-bisphosphate carboxylase large chain	Unclassified Archaea	LoihiMaxBin012
Ga0117756_1020642	Ga0117756_10206421	gi 495361790 ref WP_008086508.1	III	57.3	419	4E-170	496	ribulose-bisphosphate carboxylase large chain	Ignaviibacteria	IgnaviMaxBin015
Ga0117756_1000079	Ga0117756_10000797	gi 918697881 ref WP_052567263.1	not rubisco	40.6	527	2E-132	407	ribulose-bisphosphate carboxylase large chain	gemmatimonadetes	GemmaBin005
Ga0117756_1003443	Ga0117756_10034437	gi 500421767 ref WP_011930036.1	II	91.3	460	0	884	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin093
Ga0117756_1000371	Ga0117756_100037123	gi 656108512 ref WP_029132057.1	II	83.7	459	0	824	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin082
Ga0117756_1000877	Ga0117756_10008773	gi 500421767 ref WP_011930036.1	II	91.7	460	0	889	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin076
Ga0117756_1032300	Ga0117756_10323002	gi 928926965 ref WP_053951892.1	II	95.0	460	0	909	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin063
Ga0117756_1021618	Ga0117756_10216181	gi 640165948 ref WP_024807638.1	II	71.6	461	0	707	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin045
Ga0117756_1046377	Ga0117756_10463771	gi 497537089 ref WP_009851287.1	II	94.6	388	0	770	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin045
Ga0117756_1057876	Ga0117756_10578761	gi 751599392 ref WP_041067559.1	II	94.5	274	0	546	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin045
Ga0117756_1025798	Ga0117756_10257982	gi 759392796 ref WP_043117722.1	I	96.9	413	0	842	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin045
Ga0117756_1002875	Ga0117756_10028757	gi 521063127 ref WP_020395078.1	II	90.7	461	0	886	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin038
Ga0117756_1006138	Ga0117756_10061384	gi 983348972 ref WP_060528669.1	II	94.4	461	0	918	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin038
Ga0117756_1043410	Ga0117756_10434101	gi 983348972 ref WP_060528669.1	II	92.0	162	8E-105	319	ribulose-bisphosphate carboxylase large chain	Gammmaproteobacteria	GammaBin038

Supplemental Table 6. Genes identified as ATP-citrate lyase Beta-subunits.

Scaffold	Class	Genome Bin	Locus Tag	Gene Name	Closes species as identified by IMG
Ga0117756_1000566	Epsilonproteobacteria	EpsilonBin032	Ga0117756_100056631	ATP-citrate lyase beta-subunit	Sulfurovum sp. AR
Ga0117756_1004299	Epsilonproteobacteria	EpsilonBin027	Ga0117756_10042996	ATP-citrate lyase beta-subunit	Nitratiruptor sp. SB155-2
Ga0117756_1006995	Epsilonproteobacteria	EpsilonBin053	Ga0117756_10069953	ATP-citrate lyase beta-subunit	Sulfurovum sp. AR
Ga0117756_1047188	Epsilonproteobacteria	EpsilonBin071	Ga0117756_10471882	ATP-citrate lyase beta-subunit	Sulfurovum sp. AR
Ga0117756_1059723	Epsilonproteobacteria	EpsilonBin033	Ga0117756_10597232	ATP-citrate lyase beta-subunit	Sulfurimonas autotrophica OK10, DSM 16294
Ga0117756_1137333	NA	NA	Ga0117756_11373331	ATP-citrate lyase beta-subunit	Sulfurimonas autotrophica OK10, DSM 16294
Ga0117756_1139997	NA	NA	Ga0117756_11399971	ATP-citrate lyase beta-subunit	Sulfurimonas autotrophica OK10, DSM 16294