Air Force Civil Engineer Center

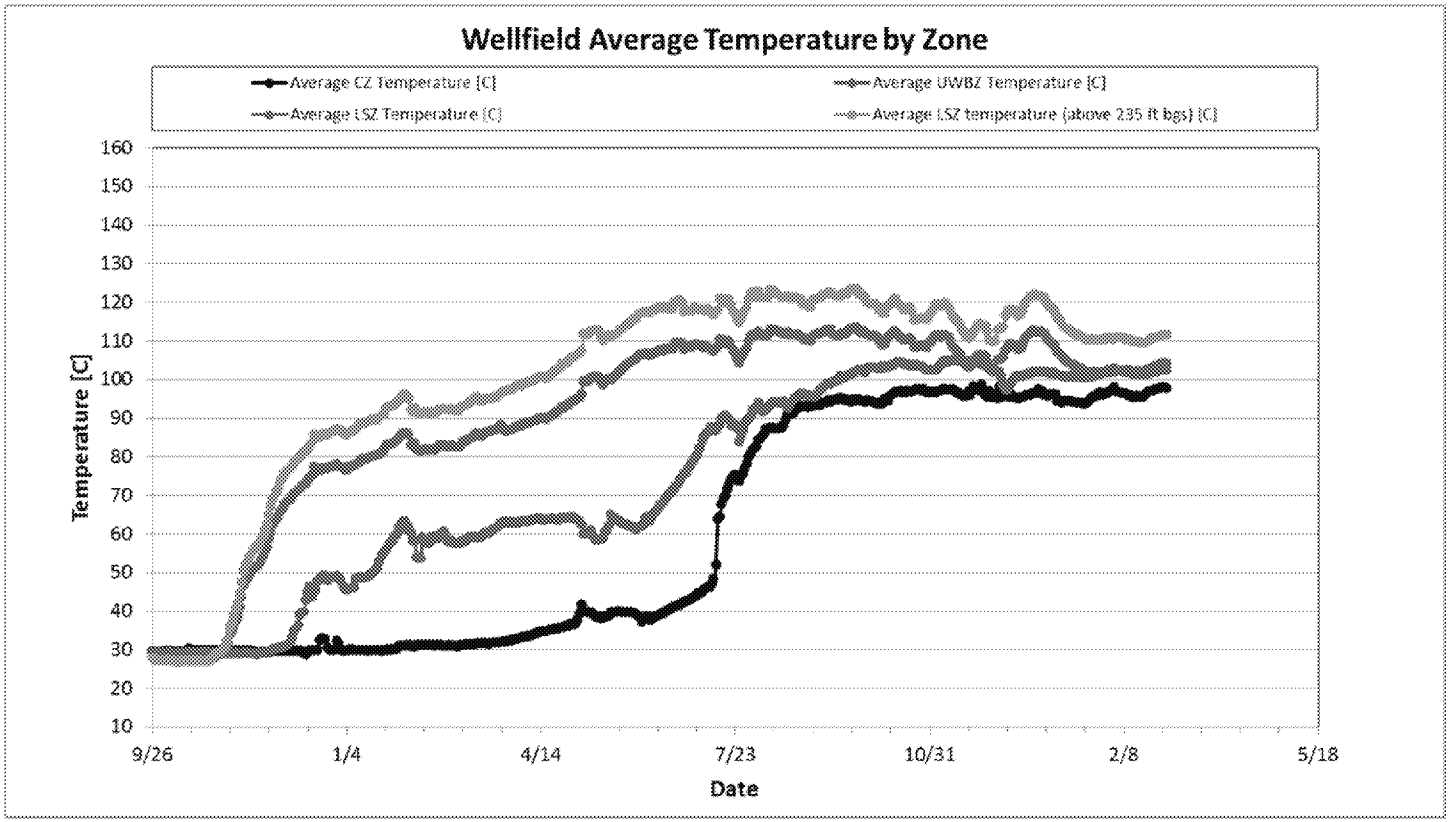
Integrity - Service - Excellence

FORMER
WILLIAMS AIR FORCE BASE

Site ST012
Former Liquid Fuels Storage Area Remedial Action

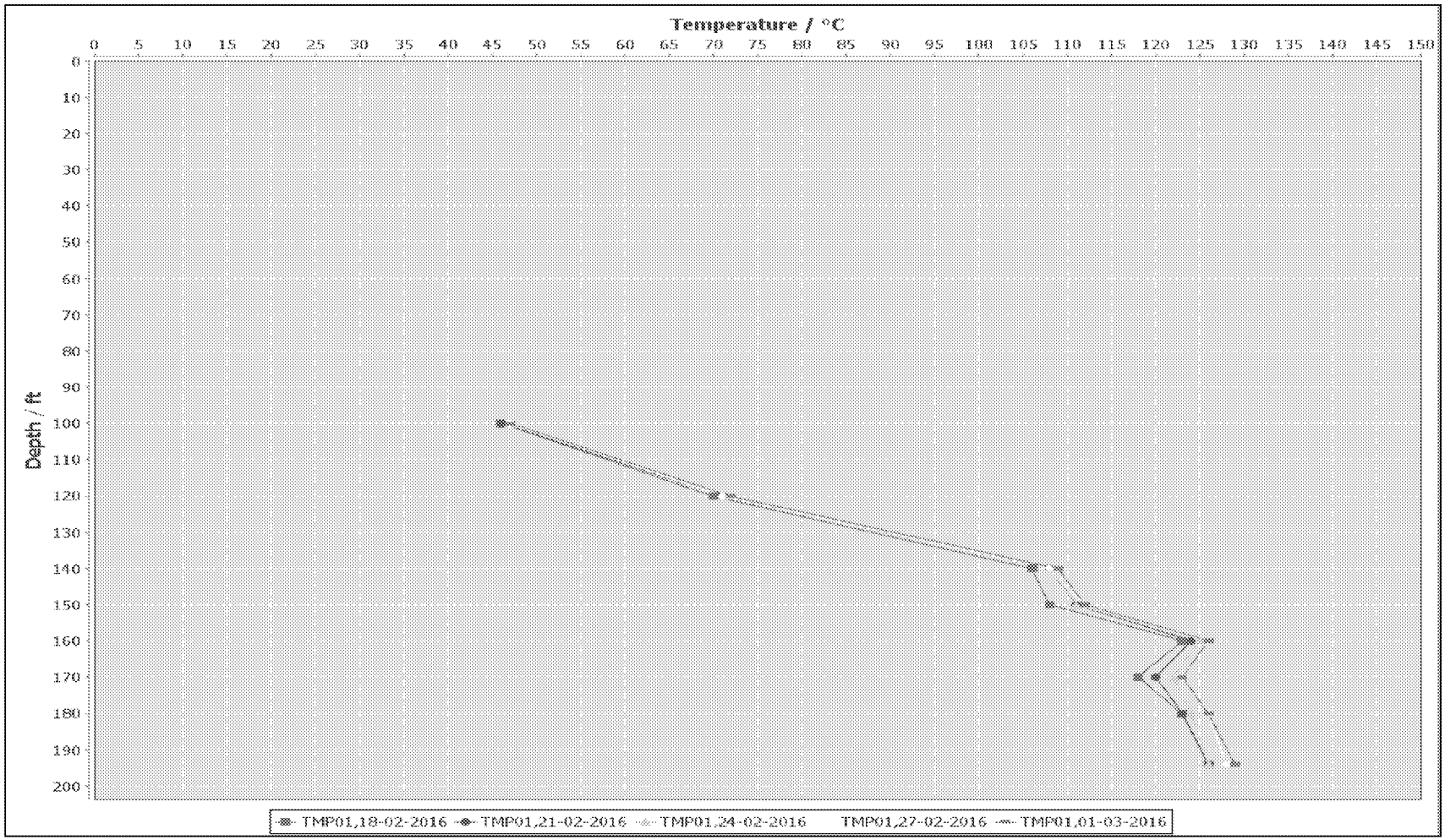
2 March 2016

Site ST012 Temperature Update



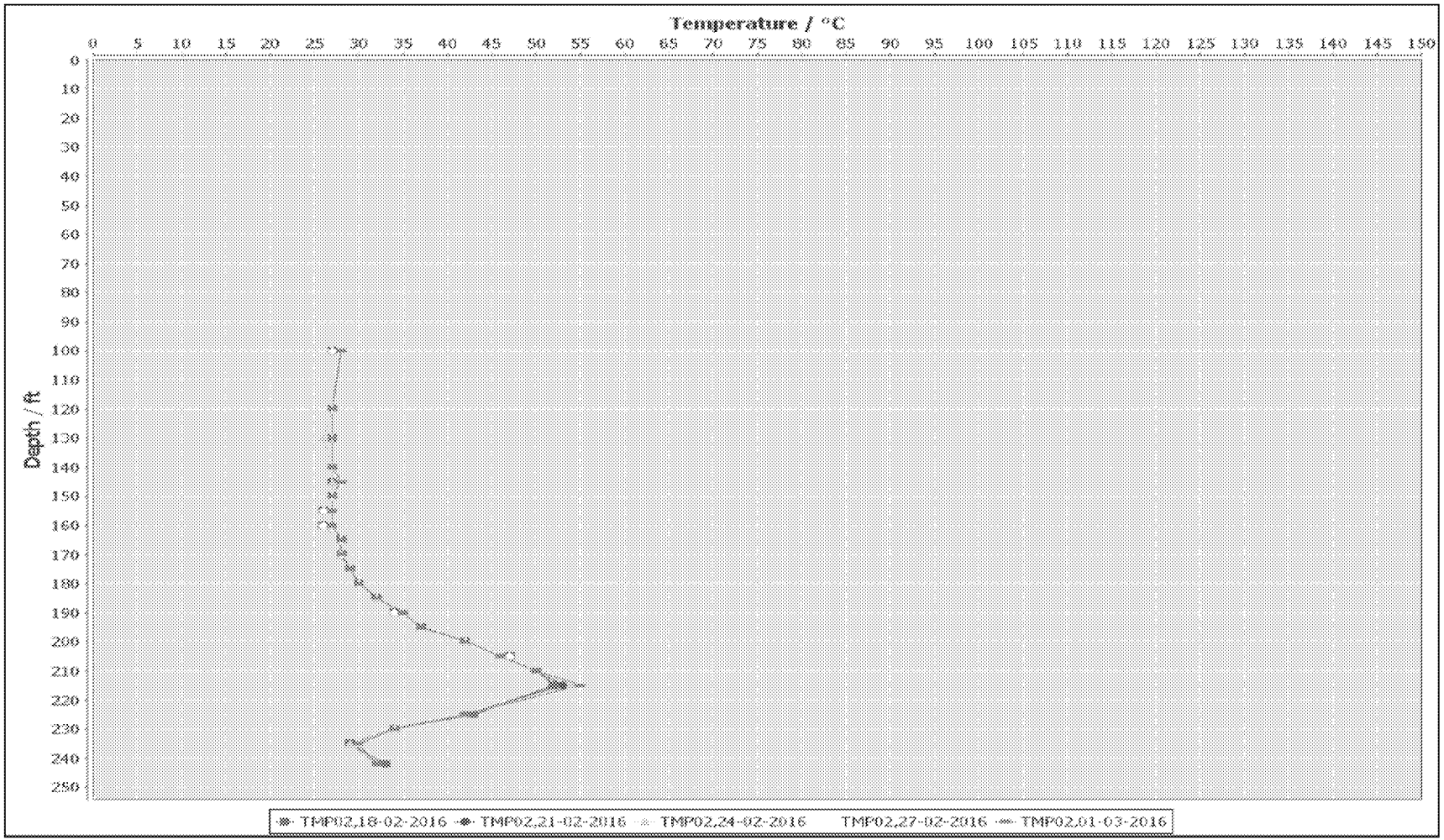
- Pressurization cycle initiated on February 18, 2016. Steam has been injected for 13 days since the last depressurization cycle.

Site ST012 SEE TMP Temperature Profiles
TMP-01



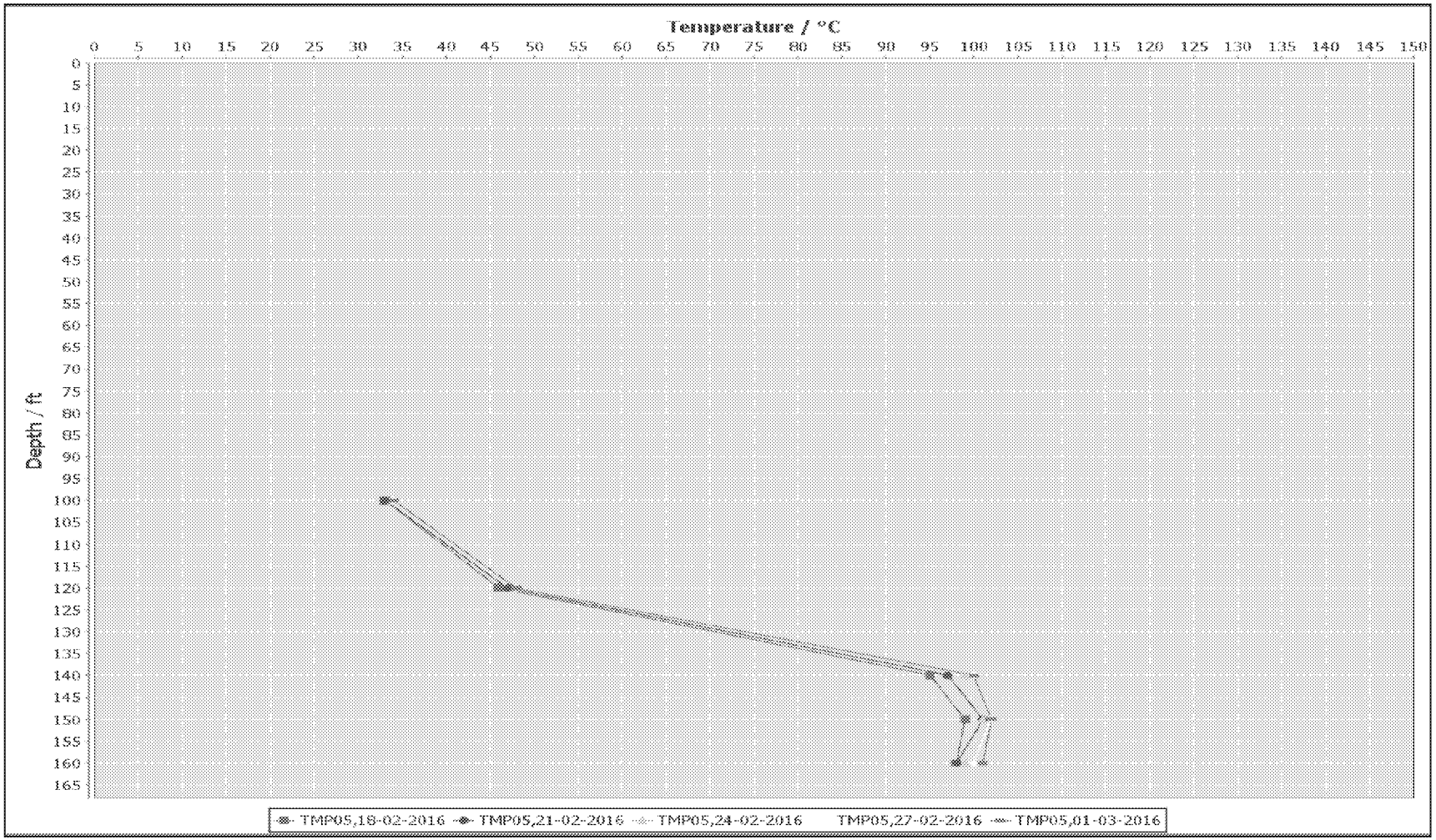
ED_005025_00006130-00003

Site ST012 SEE TMP Temperature Profiles
TMP-02



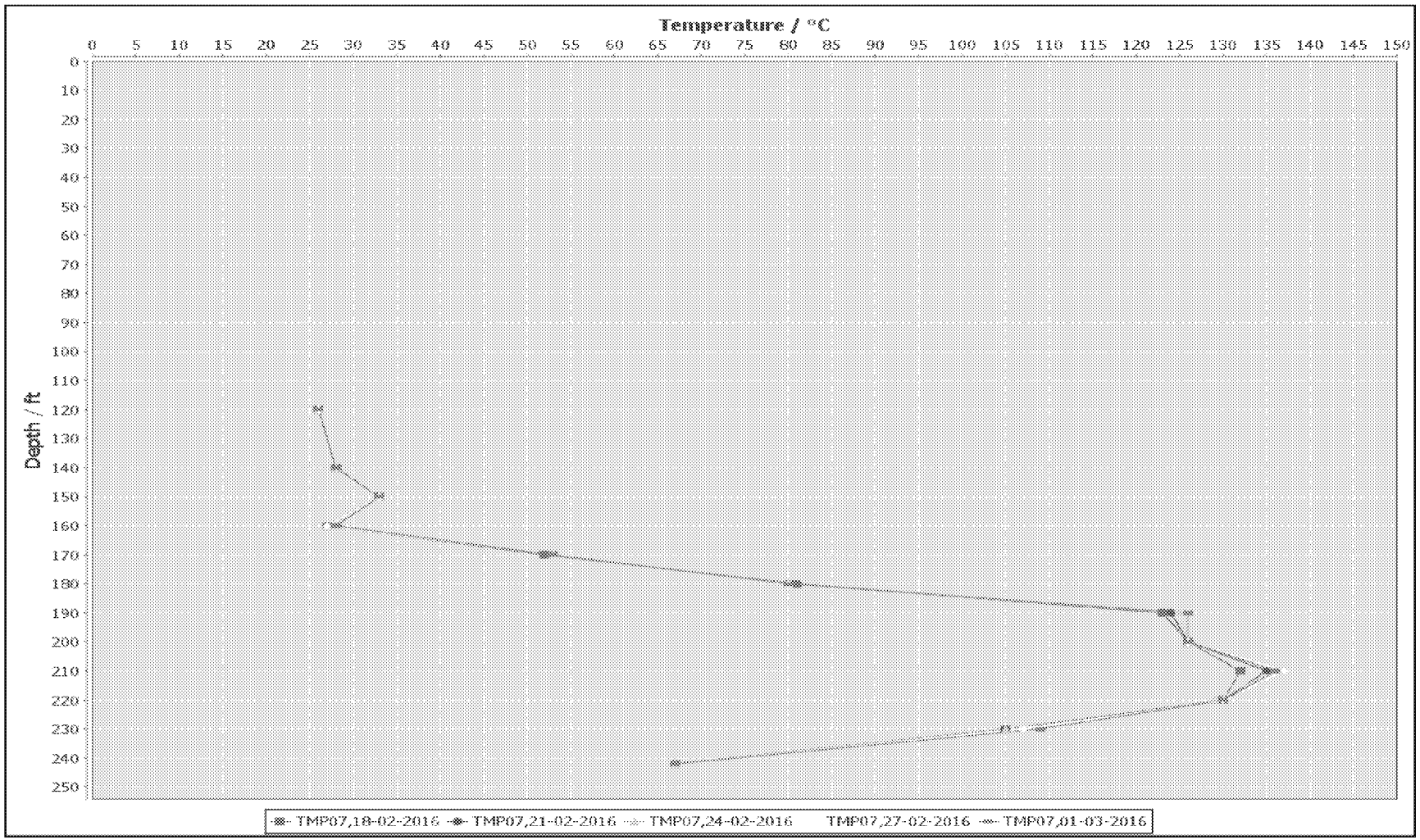
ED_005025_00006130-00004

Site ST012 SEE TMP Temperature Profiles
TMP-05



ED_005025_00006130-00005

Site ST012 SEE TMP Temperature Profiles
TMP-07



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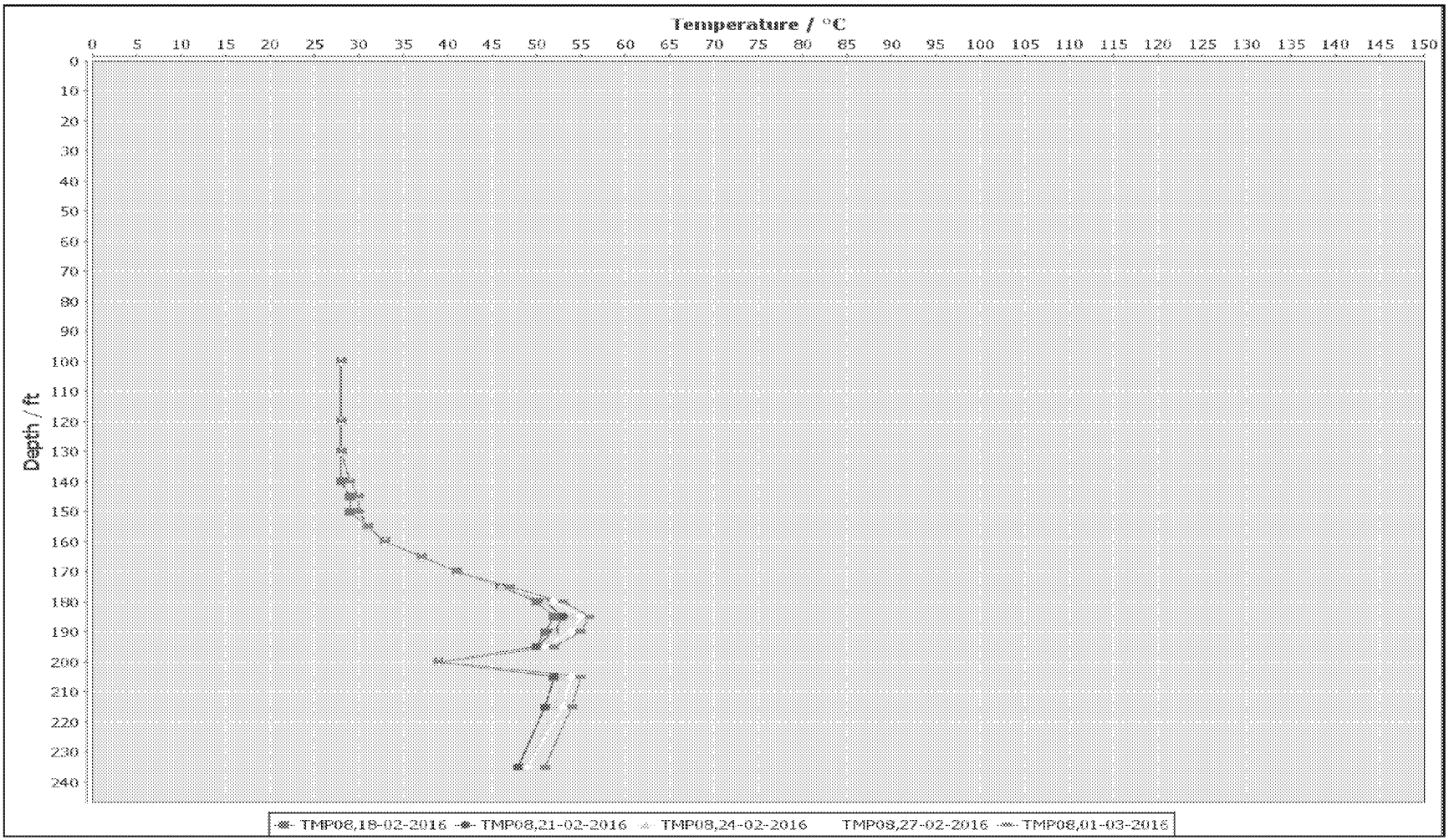
Site ST012 SEE TMP Temperature Profiles
TMP-08



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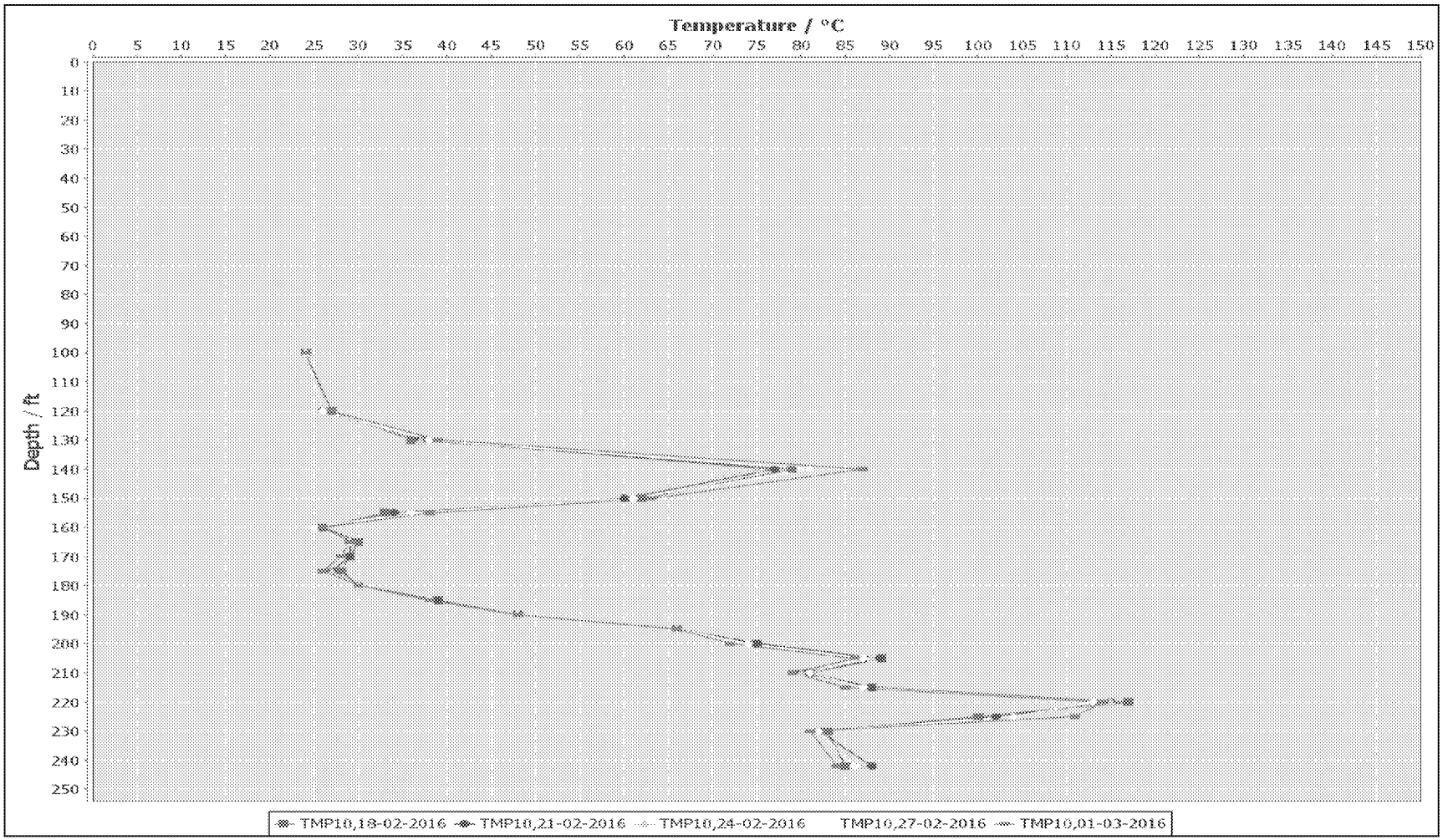
Site ST012 SEE TMP Temperature Profiles
TMP-10



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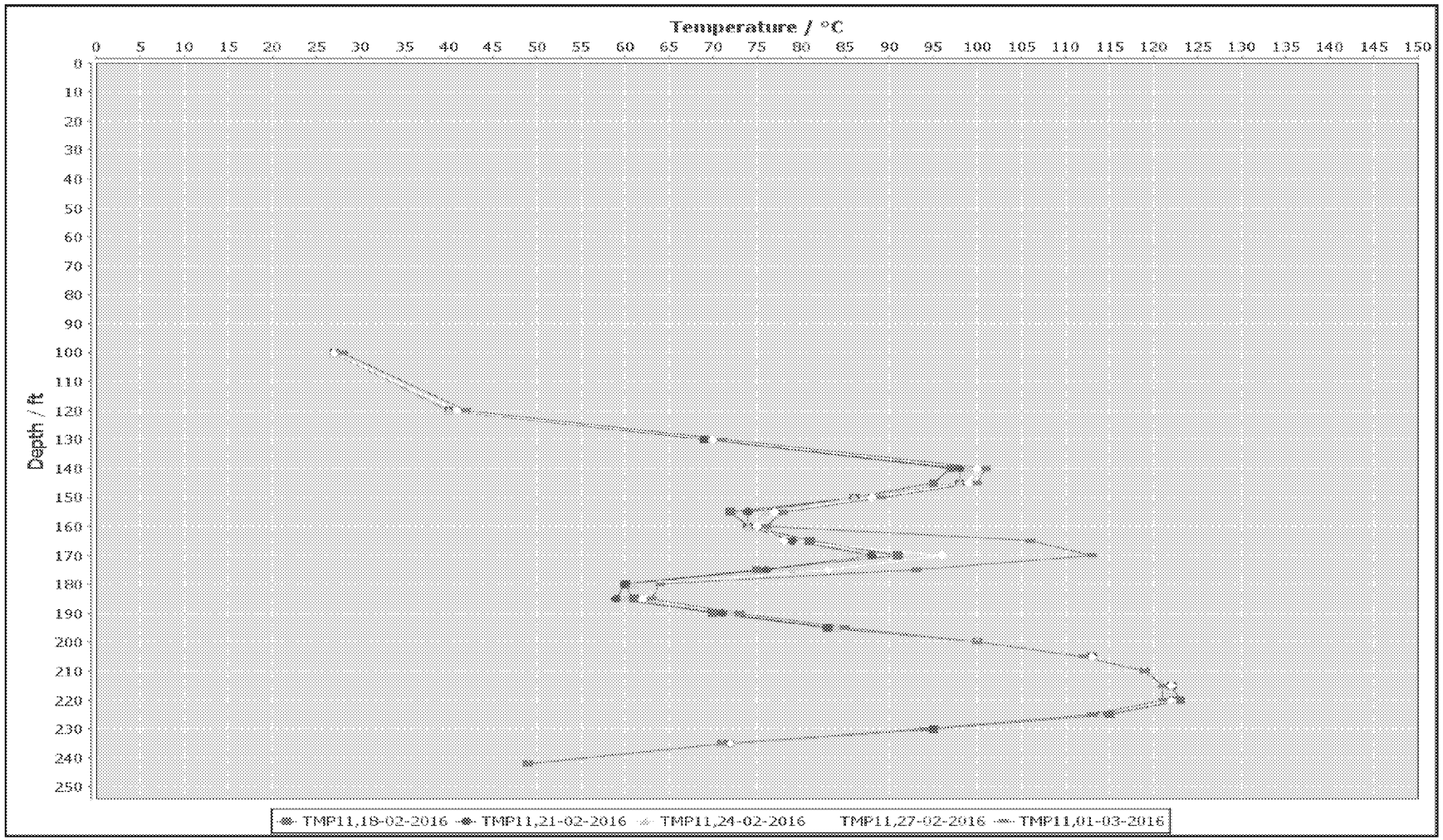
Site ST012 SEE TMP Temperature Profiles
TMP-11



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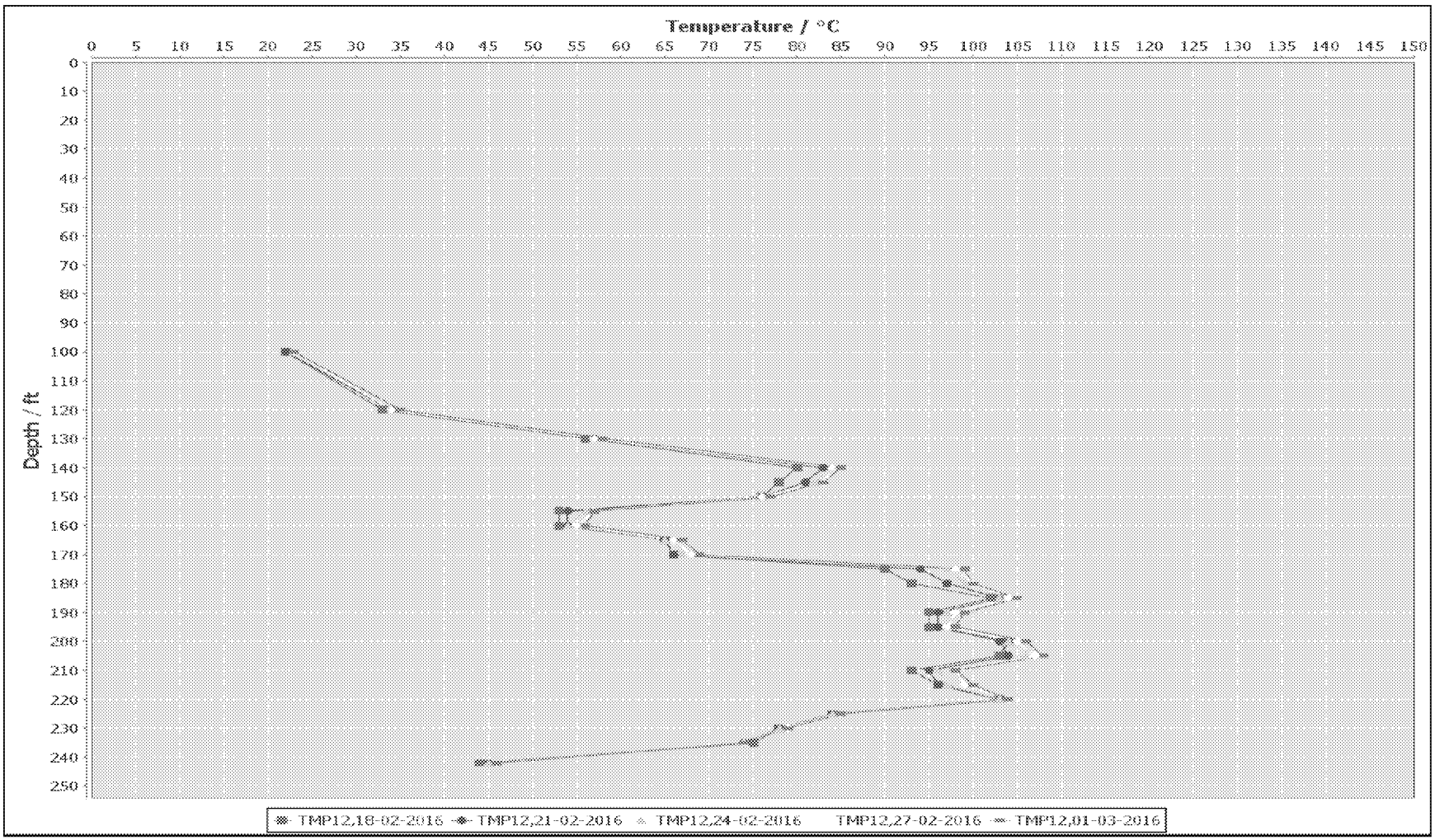
Site ST012 SEE TMP Temperature Profiles
TMP-12



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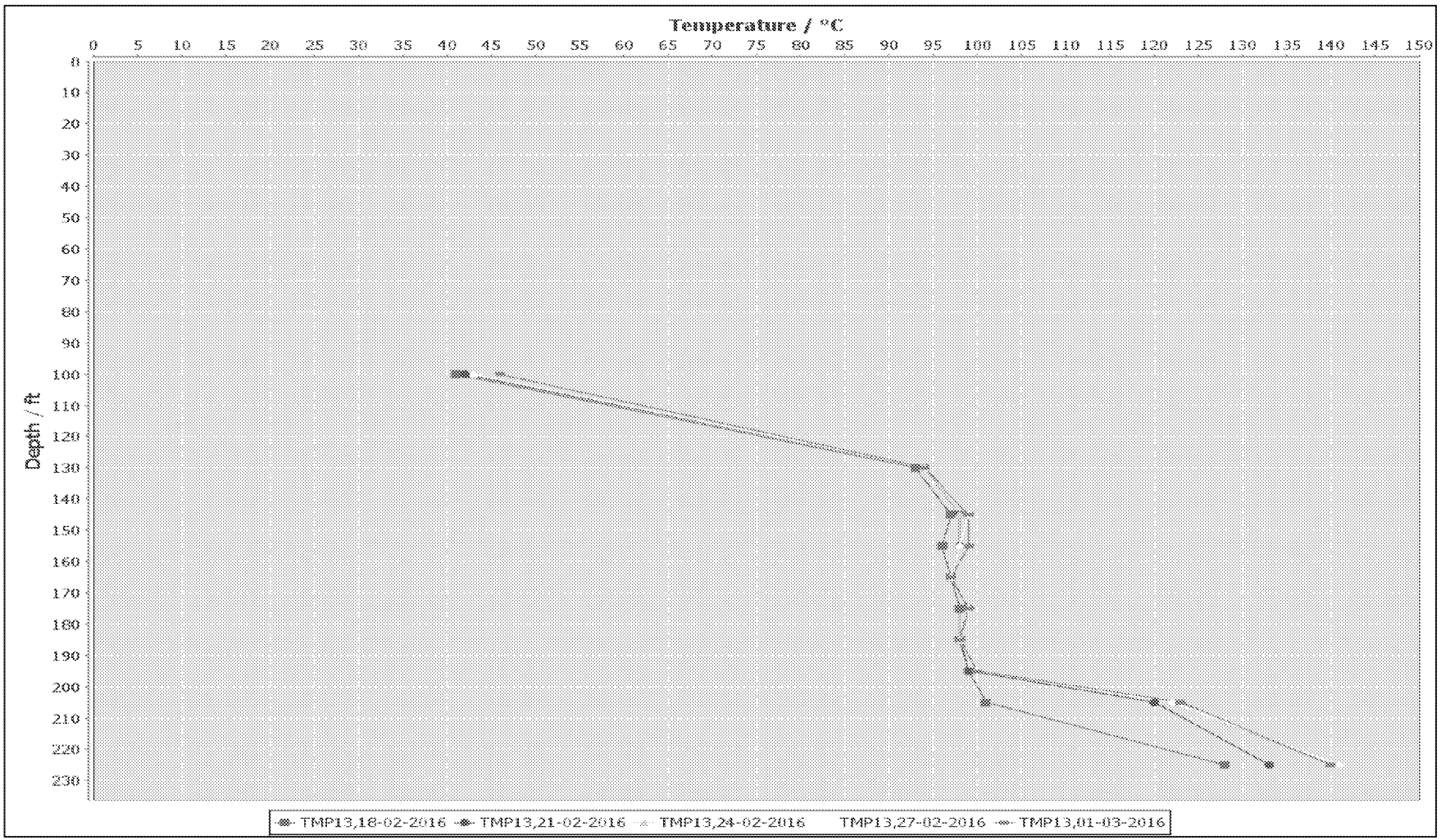
Site ST012 SEE TMP Temperature Profiles
TMP-13



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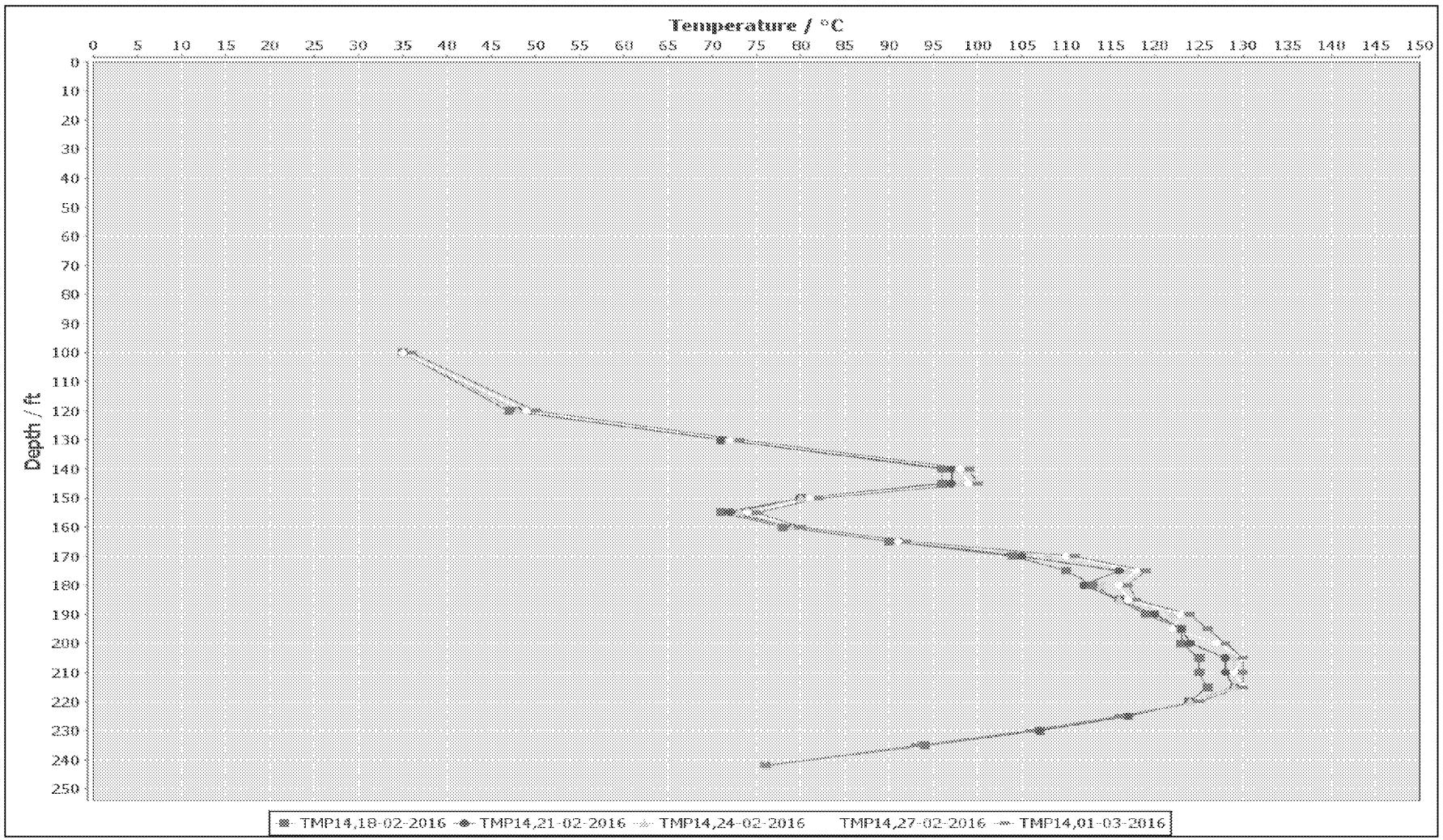
Site ST012 SEE TMP Temperature Profiles
TMP-14



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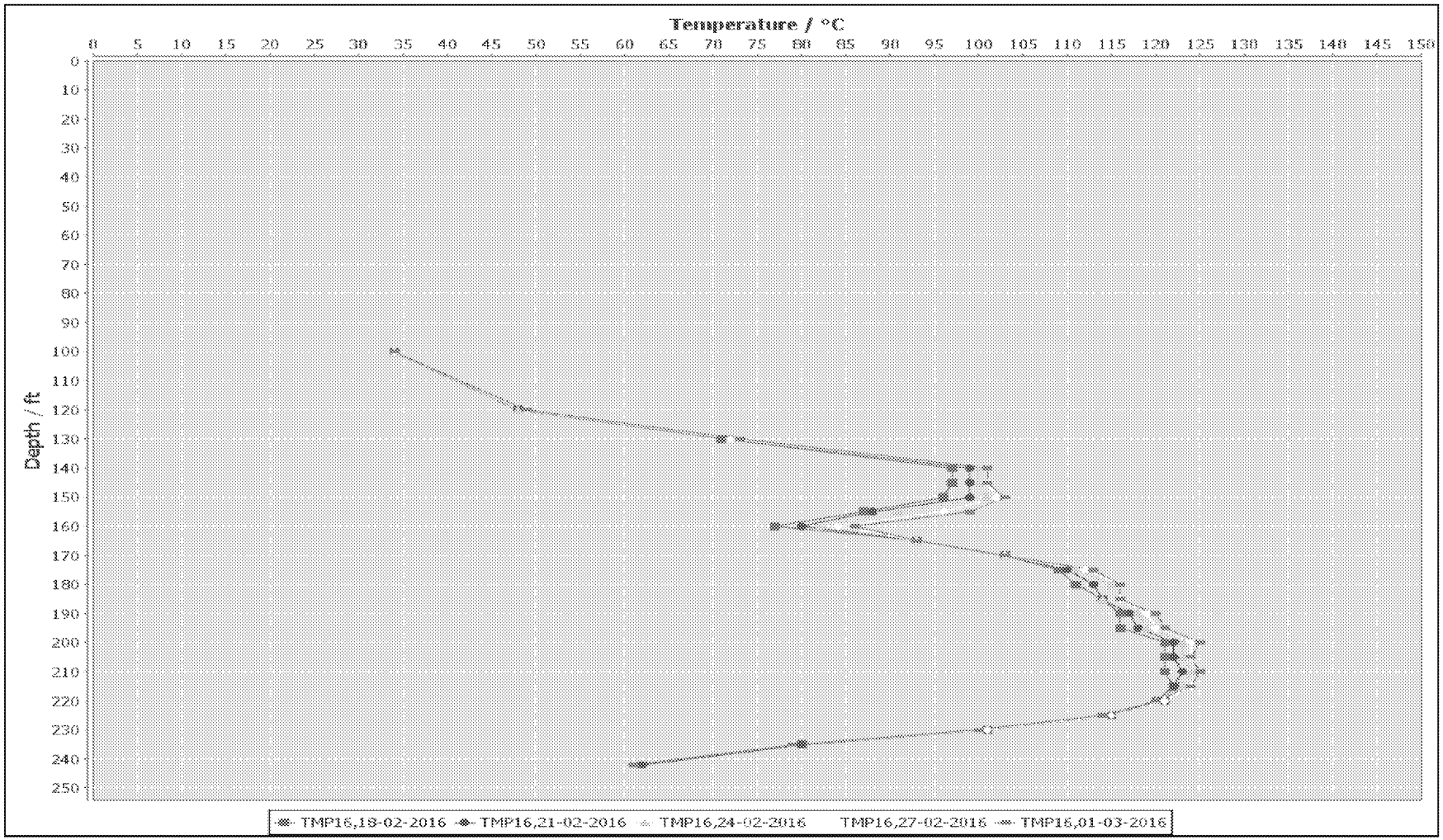
Site ST012 SEE TMP Temperature Profiles
TMP-16



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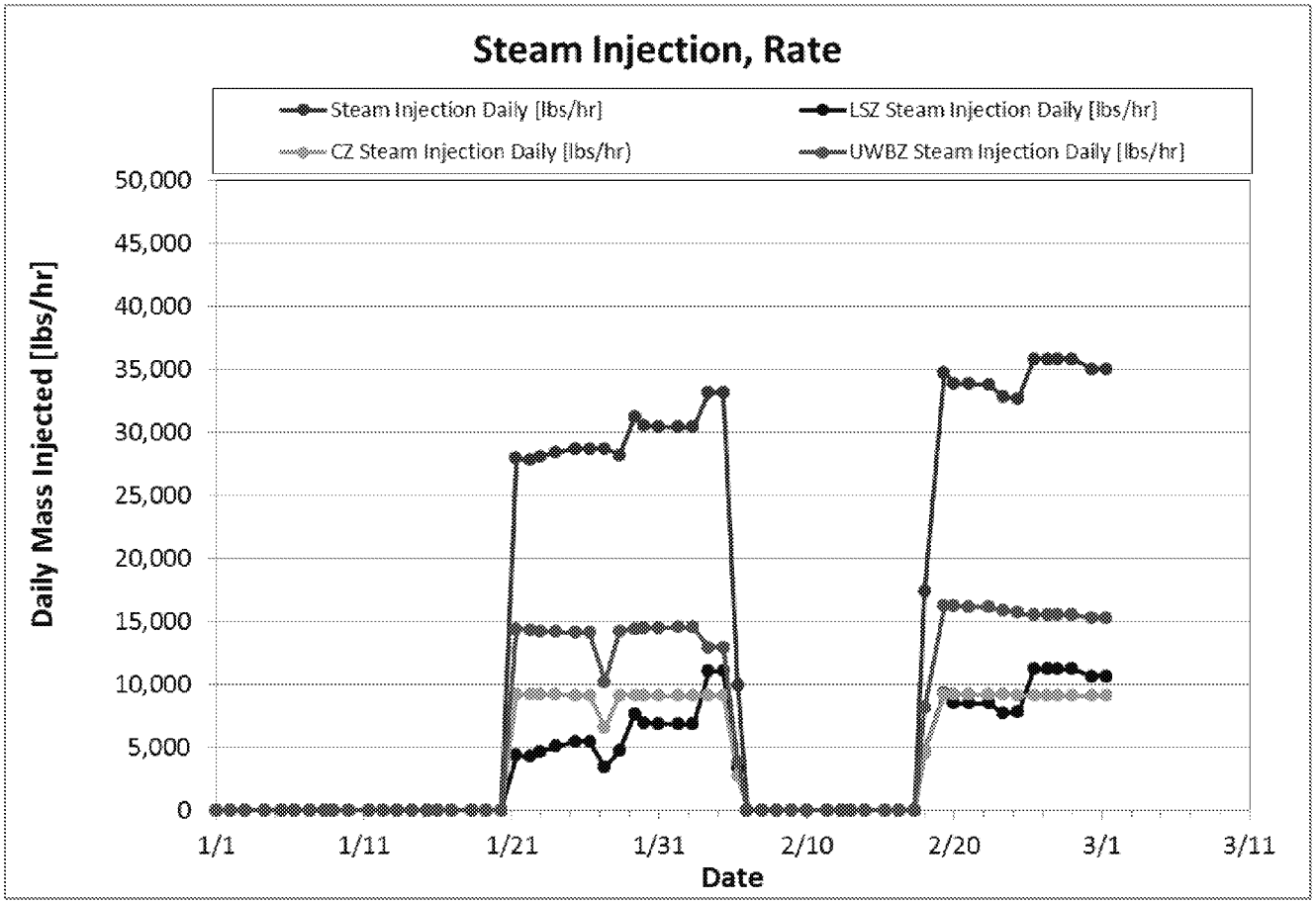
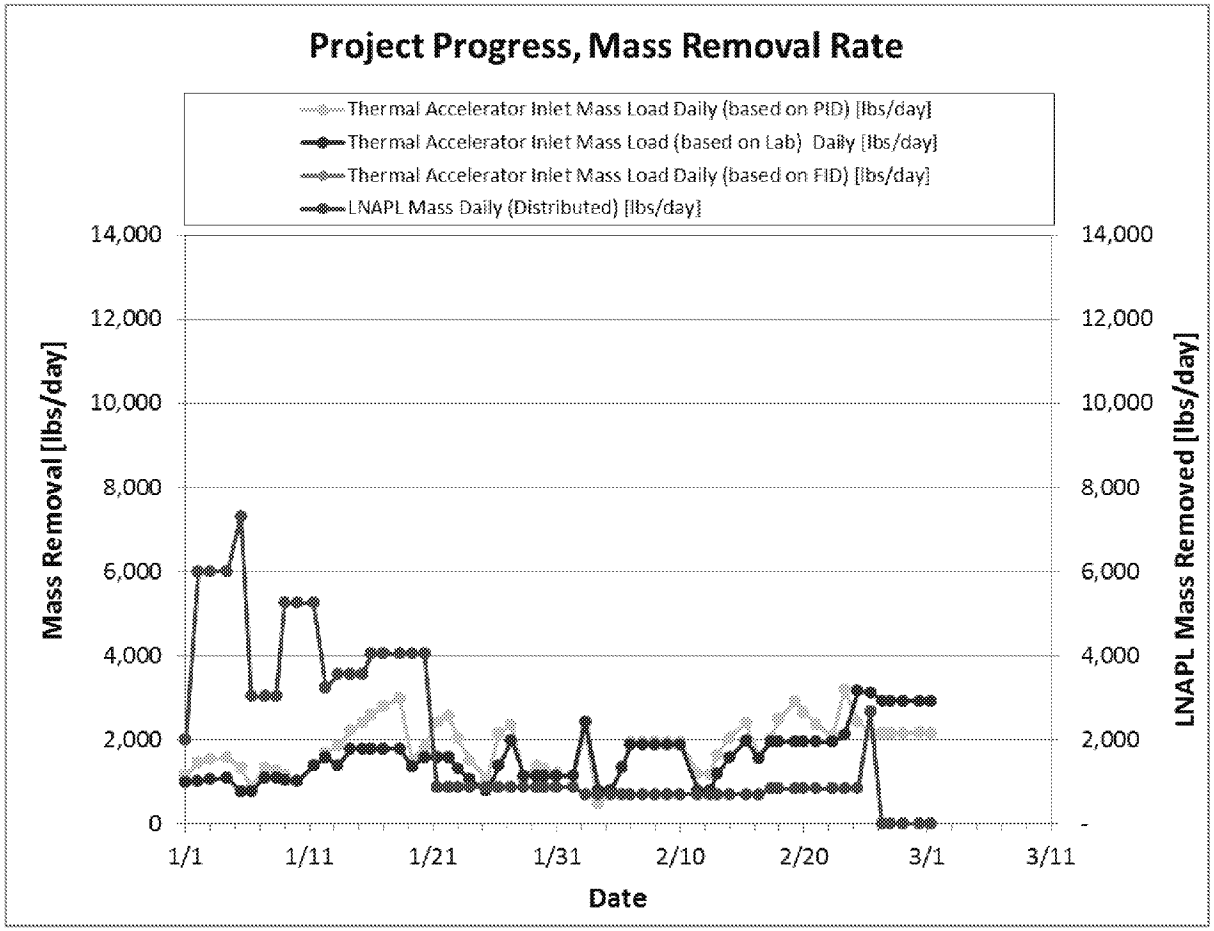
ST012 Steam Injection



ST012 SEE Mass Removal



- No LNAPL has been transferred since February 25, 2016.

Site ST012 SEE
MPE Steam Breakthrough Achievement (CZ)

MPE Formation Temperatures													
Well	Well	Required to Reach	Reached Steam	Vapor Extraction	2/2/16	2/4/16	2/11/16	2/15/16	2/17/16	2/19/16	2/24/16	2/26/16	3/1/16
	Location	Steam Temperature	Temperature (Calculated)	Max Temperature [°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]
CZ07	Perimeter	No	Yes	158	>220	>220	212	104	105	100	>220	8	>220
CZ08	Perimeter	No	Yes	192					8		>220		
CZ09	Perimeter	No	Yes	105	123	139	76	126	>220	86	123	97	186
CZ10	Perimeter	No	Yes	206	201	>220	170	50	50	55	186	71	>220
CZ11	Interior	Yes	Yes	217									
CZ12	Perimeter	No	Yes	220	>220	>220	205	186	218	35	191	212	>220
CZ13	Perimeter	No	Yes	160	>220	>220	83		45	80	>220	172	>220
CZ14	Perimeter	No	Yes	112	216	>220	186	96	96		>220		>220
CZ15	Interior	Yes	Yes	170	>220	>220	190	100	101	116	>220	134	>220
CZ16	Perimeter	No	Yes	212	>220	>220	216	82	84	73	>220	>220	>220
CZ17	Perimeter	No	Yes	200	>220	>220				111	209	110	191
CZ18	Perimeter	No	Yes	208	>220	200	88	158	182	79	167	93	100
CZ19	Perimeter	No	Yes	110	182	>220	184	107	106	95	198	191	207
CZ20	Outside CZ	No	No	111	102	95	91		71	67		88	101

Depressurization Pressurization

- Depressurization cycle started on February 5, 2016.
- Pressurization cycle started on February 18, 2016.

Site ST012 SEE
MPE Steam Breakthrough Achievement (UWBZ)

MPE Formation Temperatures													
Well	Well	Required to Reach	Reached Steam	Vapor Extraction	2/2/16	2/4/16	2/11/16	2/15/16	2/17/16	2/19/16	2/24/16	2/26/16	3/1/16
	Location	Steam Temperature	Temperature (Calculated)	Max Temperature [°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]
UWBZ01	Interior	Yes	Yes	150					56	43	193	176	211
UWBZ02	Interior	Yes	Yes	210	>220	>220		98	99	138	>220	73	>220
UWBZ04	Interior	Yes	Yes	188	>220	>220	>220	108		101	>220	146	>220
UWBZ05	Interior	Yes	Yes	220	>220	>220		196		46	>220		
UWBZ06	Interior	Yes	Yes	165	164	175	169	120	119	103	165	92	172
UWBZ10	Perimeter	No	Yes	179	>220	>220	186	189	161	59	>220	89	>220
UWBZ17	Perimeter	No	Yes	220	>220	>220	198	59	46	25	>220	63	>220
UWBZ18	Interior	Yes	Yes	200	>220	>220	>220			122	>220	95	>220
UWBZ19	Perimeter	No	Yes	162	>220	>220	154	121	120	69	201	98	>220
UWBZ20	Dual Phase - Perimeter	No	No	112							96		
UWBZ21	Outside UWBZ	No	Yes	118	>220	>220	161	170	201	92	>220	>220	>220
UWBZ22	Perimeter	No	Yes	127	>220	205	>220	23	43	>220	192	190	218
UWBZ23	Outside UWBZ	No	Yes	206					125	38	>220	>220	>220
UWBZ24	Dual Phase - Perimeter	No	Yes	200	>220	>220	>220	218	218	91	218	>220	>220
UWBZ26	Outside UWBZ	No	Yes	105	152	165		132	131		150		
UWBZ27	Outside UWBZ	No	Yes	115	200	144			52	100	166		

RED	: at or above steam temperature (≥210 °F)
GREEN	: below steam temperature (<210 °F)

Depressurization

Pressurization

Site ST012 SEE
MPE Steam Breakthrough Achievement (LSZ)

MPE Formation Temperatures													
Well	Well	Required to Reach	Reached Steam	Vapor Extraction	2/2/16	2/4/16	2/11/16	2/15/16	2/17/16	2/19/16	2/24/16	2/26/16	3/1/16
	Location	Steam Temperature	Temperature (Calculated)	Max Temperature [°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]	[°F]
LSZ01	Interior	Yes	Yes	126	206	>220	122	137	136	80	195	198	191
LSZ02	Interior	Yes	Yes	130	181	192	74	>220	>220	116	195	66	181
LZS04	Interior	Yes	Yes	206									
LSZ05	Interior	Yes	Yes	220	>220	>220	207	149	149	130	>220	77	>220
LSZ06	Interior	Yes	Yes	218	>220	>220	>220	124	124	177	207	188	177
LSZ08	Perimeter	No	Yes	120	155	160	138	152	143	82	130	63	122
LSZ11	Perimeter	No	Yes	119	92	96		44			94		
LSZ12	Perimeter	No	Yes	126	187	181	153	126	128	97	164	164	126
LSZ13	Interior	Yes	Yes	125	150	167	>220	210	209	33	178	139	>220
LSZ14	Perimeter	No	Yes	177	197	196	171	125	123	68	207	169	196
LSZ15	Interior	Yes	Yes	208	>220	>220		120	108	135	210	193	205
LSZ16	Interior	Yes	Yes	205	200		188	92	89	28		48	
LSZ17	Perimeter	No	Yes	220	123	120	96	79	79	66	101	68	109
LSZ28	Perimeter	No	Yes	129	172	189	175	68	68	76	175	4	176
LSZ29	Perimeter	No	Yes	116	194	208	115	177	163	>220	>220	>220	149
LSZ30	Interior	Yes	Yes	133	>220	>220	>220	>220	219		>220	77	>220
LSZ31	Interior	Yes	Yes	147	189	>220	151	108	71		91	95	>220
LSZ32	Interior	Yes	Yes	120	216	>220		76	86		206	186	216
LSZ33	Perimeter	No	Yes	130	>220	>220		>220	>220	35	>220	197	>220
LSZ34	Interior	Yes	Yes	168						47	177	166	183
LSZ35	Perimeter	No	Yes	121	113	115	111	115	115	118	110	108	117
LSZ36	Perimeter	No	Yes	128	147		125	85	85	59	150	145	143
LSZ37	Perimeter	No	Yes	208	158	155	117	87	90	76	151	152	174
LSZ38	Perimeter	No	Yes	116	>220		99	60	58	72	157	131	154
LSZ39	Perimeter	No	No	118	146			185		18	122		
LSZ40	Interior	Yes	Yes	135	>220		>220	121		113		213	
LSZ42	Perimeter	No	Yes	130	>220		178	103	102	72	179	167	180

Depressurization ← → Pressurization