Appendix B
Additional Data on Alternatives

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This appendix provides the summary of the different amounts of remedial infrastructure estimated for the different alternatives analyzed in this EIR.

As described in Chapter 2, *Project Description*, the PG&E FS evaluations (and Addenda) were based on the contaminated plume as it was defined at the time of the evaluation. The ~~current~~ chromium plume as of Q4 2011 was~~is~~ approximately 2,949 acres and the chromium plume as of Q4 2012 was approximately 3,122 acres, which is larger than the plume that was studied in the FS as described below:

- *Alternative 4B.* FS Addendum 2 used the Q1 2010 plume as its base condition for study for Alternative 4B. The Q1 2010 plume (defined by the 3.1 ppb Cr[VI] contour) was approximately 1,225 acres in size.
- *Alternative 4C-2 to Alternative 4C-5.* As Feasibility Study Addendum 3 studied both the Q1 2010 plume and the Q1 2011 plume. Addendum 3 (and subsequent data provided by PG&E) presented an identification of infrastructure needed to address the Q1 2011 plume. The Q1 2011 plume (defined by the 3.1 ppb Cr[VI] contour) was approximately 1,788 acres in size.

The full extent of the plume area going forward cannot be defined at this time because the plume boundary may be larger than previously delineated~~the Q4 2011 delineated boundary~~ as a result of further investigation and/or plume migration. Therefore, for this EIR, it has been assumed that the contaminated plume may be larger by up to 15% from the Q4 2011 plume, which would result in a total plume area of 3,391 acres. This study plume area is approximately 190% larger than the Q1 2011 plume~~, and~~ 277% larger than the Q1 2010 plume, and 9% larger than the Q4 2012 plume.

To provide an estimate of the potential expanded amount of remedial activity that may be necessary to address a future plume that is substantially larger than that used as the base condition for identification of remedial activities proposed in the FS (and Addenda), the FS estimates of remedial activity were scaled as follows:

- *No Project Alternative* – The No Project Alternative was not scaled up as it is presumed that remedial activity will be limited to the area of the plume as identified between 2008 and 2010.
- *Agricultural Land Treatment* –Agricultural unit (AU) acreages, piping, wells and extraction flows were scaled up by increasing the FS amounts to include additional AU acreage, infrastructure and flows to treat the revised plume area.
- *In-Situ Remediation* – In-situ remediation is primarily proposed to address the high concentration part of the plume (> 50 ppb) and some of the medium concentration part of the plume (> 10 ppb). The 50 ppb plume boundary has been mostly stable in recent years due to remedial actions. The 10 ppb plume boundary has expanded but not to the same degree as the 3.1 ppb plume boundary. As a result, scaling for in-situ remediation wells, piping, and flows utilized a 25% factor instead of scaling based on plume size.
- *Ex-Situ Remediation* – Ex-situ remediation is proposed in Alternative 4C-3 to maintain year-round pumping rates and winter hydraulic control and treatment and thus ex-situ remediation activity for Alternative 4C-3 was scaled using the same methods as for agricultural land

treatment. Ex-situ treatment is proposed in Alternative 4C-5 for treatment of the high concentration plume (>50 ppb) area. Since the high concentration plume area has been more or less stable due to current remedial actions, no scaling was applied for ex-situ treatment in Alternative 4C-5 but a scaling factor of 25% was included for the purposes of EIR analysis.

- *Freshwater Injection* – To date, freshwater injection on the northwest side of the plume has been effective at controlling further westward migration of the plume and deflecting its movement northward. Thus, it was assumed that a similar amount of freshwater injection would be used in all alternatives in the future. A scaling factor of 15% was used in order to cover potential expansion, should it be needed, to the existing amounts for EIR analysis.
- *Monitoring Wells* – As the plume has expanded, the number of monitoring wells has also expanded. A scaling factor of 25% was added to the existing and projected number of monitoring wells for the EIR analysis.

Tables that summarize the original FS totals for each alternative and show the specific scaling adjustments to account for the expanded plume are presented in this appendix.

Table B-1: PG Hinkley Groundwater Remediation Infrastructure Quantities, Based on PG Feasibility Study/Addenda Data, 2011 - 2012 (Updates in bold 03/20/13)

Element	Units	Existing Condition	No Project	Alternative 4B	Alternative 4C-2	Alternative 4C-3	Alternative 4C-4	Alternative 4C-5
AUs (total)	Acres	182	182	222	351	351	895	351
AUs (New over existing)	Acres		0	40	168	168	713	168
AUs (New over No Project)	Acres			40	168	168	713	168
AUs Piping (total)	LF	24,499	24,499	36,719	41,674	41,674	53,974	41,674
AUs Piping (New over existing)	LF		0	12,220	17,175	17,175	29,475	17,175
AUs Piping (New over No Project)	LF			12,220	17,175	17,175	29,475	17,175
AU wells (total)	#	29	29	44	56	56	56	56
AU wells (New over existing)	#		0	15	27	27	27	27
AU wells (New over No Project)	#			15	27	27	27	27
AU pumping (total)	gpm	1,100	1,100	1,270	2,042	2,829	2,829	2,042
AU pumping (New over existing)	gpm		0	170	942	1,729	1,729	942
AU pumping (New over No Project)	gpm			170	942	1,729	1,729	942
IRZ piping (total)	LF	14,985	33,892	33,892	33,892	33,892	33,892	33,892
IRZ piping (New over existing)	LF		18,907	18,907	18,907	18,907	18,907	18,907
IRZ piping (New over No Project)	LF			0	0	0	0	0
IRZ wells (total)	#	70	109	109	109	109	109	91
IRZ wells (New over existing)	#		39	39	39	39	39	21
IRZ wells (New over No Project)	#			0	0	0	0	-18
IRZ injection wells (total)	#	58	89	89	89	89	89	73
IRZ injection wells (New over existing)	#		31	31	31	31	31	15
IRZ injection wells (New over No Project)	#			0	0	0	0	-16
IRZ extraction wells (total)	#	12	20	20	20	20	20	18
IRZ extraction wells (New over existing)	#		8	8	8	8	8	6
IRZ exraction wells (New over No Project)	#			0	0	0	0	-2
IRZ dosed injection flow (total)	gpm	190	190	345	345	345	345	195
IRZ dosed injection flow (New over existing)	gpm		0	155	155	155	155	5
IRZ dosed injection flow (New over No Project)	gpm			155	155	155	155	5
SCRIA dosed-injection flow (total)	gpm	110	110	195	195	195	195	195
SCRIA dosed-injection flow (total) (New over existing)	gpm		0	85	85	85	85	85
SCRIA dosed-injection flow (total) (New over No Project)	gpm			85	85	85	85	85
SAIRZ dosed-injection flow (total)	gpm	80	80	150	150	150	150	0
SAIRZ dosed-injection flow (total) (New over existing)	gpm		0	70	70	70	70	-80
SAIRZ dosed-injection flow (total) (New over No Project)	gpm			70	70	70	70	-80
IRZ recirculation flow (total, CAIRZ/SAIRZ)	gpm	83	83	223	223	223	223	223
IRZ recirculation flow (New over existing)	gpm		0	140	140	140	140	140
IRZ recirculation flow (New over No Project)	gpm			140	140	140	140	140
Ex-situ footprint	acres	0	0	0	0	1.86	0	0.86
Exsitu wells	#					19		19
Exsitu piping	LF					22,050		6,875
Exsitu flow (annual)	gpm					788		200

Table B-1: PG Hinkley Groundwater Remediation Infrastructure Quantities, Based on PG Feasibility Study/Addenda Data, 2011 - 2012 (Updates in bold 03/20/13)

Element	Units	Existing Condition	No Project	Alternative 4B	Alternative 4C-2	Alternative 4C-3	Alternative 4C-4	Alternative 4C-5
FW Injection piping	LF	31,886	31,886	31,886	31,886	31,886	31,886	31,886
FW Injection**/extraction** wells	#	8	8	8	8	8	8	8
FW Injection flow	gpm	80	80	80	80	80	80	80
Monitoring wells (total, **updated with existing 03/20/13**)	#	**602**	**614**	**614**	**614**	**614**	**614**	**614**
Monitoring wells (New over existing)	#		12	12	12	12	12	12
Monitoring wells (New over No Project)	#			0	0	0	0	0
All wells (total)	#	**709**	**760**	**775**	**787**	**806**	**787**	**788**
All wells (New Over Existing)	#		51	66	78	97	78	79
All wells (New over No Project)	#			15	27	46	27	28
Well supporting acreage	Acres	**47**	**51**	**52**	**52**	**54**	**52**	**52**
Well supporting acreage (New over existing)	Acres		3	4	5	6	5	5
Well supporting acreage (New Over No Project)	Acres			1.00	1.80	3.06	1.80	1.86
Road supporting acreage	Acres		1.09	1.79	2.07	2.07	2.78	2.07
Road supporting acreage (New over existing)	Acres		1.09	1.79	2.07	2.07	2.78	2.07
Road supporting acreage (New Over No Project)	Acres			0.70	0.99	0.99	1.69	0.99

Table B-2: PG Hinkley Groundwater Remediation Infrastructure Quantities, Scaled Up from PG Feasibility Study/Addenda Data, 2011 - 2012 (Updates in bold 03/20/13)

Element	Units	Existing Condition	No Project	Alternative 4B	Alternative 4C-2	Alternative 4C-3	Alternative 4C-4	Alternative 4C-5	Notes
Plume (3.1 ppb) at time of FS	Acres	1,225	1,788	1,225	1,788	1,788	1,788	1,788	Q1 2010 for Existing, No Project, and 4B, Q1 2011 for all other Alternatives)
Q4 2011 Plume (3.1 ppb)	Acres	2,949	2,949	2,949	2,949	2,949	2,949	2,949	
Q4 2011 Plume (3.1 ppb w/ 15% contingency)	Acres	3,391	3,391	3,391	3,391	3,391	3,391	3,391	
Plume (10 ppb) at time of FS	Acres	552	1,084	552	1,084	1,084	1,084	1,084	Q1 2010 for Existing and 4B, Q1 2011 for all other Alternatives)
Q4 2011 Plume (10 ppb)	Acres	1,105	1,105	1,105	1,105	1,105	1,105	1,105	
Q4 2011 Plume (10 ppb) w/15% contingency	Acres	1,271	1,271	1,271	1,271	1,271	1,271	1,271	
Northern Plan	Acres			124	124	124	249	124	Concept Plan September 2011, 04/11/12 email; For 4C-3 and -4, assume the same 3 AUs are used as Alt 4C-2 (AUs #6, 7, 8); Alt 4C-4 will add 5 more AUs (25 acres/each) because of the lower AU application rate per acre in the winter
Additional AU acreage for Expanded Plume	Acres			100	100	100	250	100	Email 03/27/12, 04/11/12; For 4C-4, assume lower AU application rate (gpm per acre AU), consistent with 4C-4 presented in Addendum #3; additional AUs for all alternatives are 25 acres/each
AU Pumping (gpm) - Northern Plan				575	575	797	797	575	For 4C-3 and 4C-4, an additional 797 gpm is extracted, but a portion (222 gpm) that is treated by AUs in 4C-4 is treated by ex-situ treatment in 4C-3
AU Pumping (gpm) - Expanded Plume				550	550	762	762	550	For 4C-3 and 4C-4, an additional 762 gpm is extracted, but a portion (212 gpm) that is treated by AUs in 4C-4 is treated by ex-situ treatment in 4C-3
Plume increase				277%	190%	190%	190%	190%	
AU Piping - Northern Plan	LF			22,900	22,900	22,900	46,400	22,900	For 4C-3 and -4, assume the same 3 AUs are used as Alt 4C-2 (AUs #6, 7, 8); Alt 4C-4 will add 5 more AUs because of the lower AU application rate per acre in the winter
AU Piping - Expanded Plume	LF			18,800	18,800	18,800	47,000	18,800	Piping assumes: a) 8 extraction wells (EWs) per 25-ac new AU; b) all EWs are located on the perimeter of the circle measuring 25 acres; c) all EWs piped directly and individually to center of pivot/circle.
AU- Wells for Northern Plan				14	14	14	54	14	For 4C-2, -3, and -4, the 3 AUs from the Northern Plan (AUs #6, 7, 8) use 14 extraction wells; For 4C-4, the additional 5 AUs beyond what was proposed in the Northern Plan use 8 extractoin wells/AU
AU- Wells for expanded AU Acreage (8 per 25 acres)				32	32	32	80	32	Assumes: a) 8 extraction wells (EWs) per 25-ac new AU
IRZ Factor (contingency)	Percent			25%	25%	25%	25%	25%	
ES contingency	Percent					25%		25%	
FW injection (contingency)	Percent			15%	15%	15%	15%	15%	
MW factor (contingency)	Percent			25%	25%	25%	25%	25%	
Road factor (% pipeline with new roads)	Percent		25%	25%	25%	25%	25%	25%	
					168				
AUs - Total (FS)	*Acres*	*182*	*182*	*222*	*351*	*351*	*895*	*351*	
AUs - Total (Scaled)	Acres	182	182	446	575	575	1,394	575	*Scaling Method: AU Acres (FS) + Northern Plan (124 acres) + additional 100 acres, except additional acreage for 4C-4.*
AUs - New over Existing	Acres		0	264	392	392	1,212	392	
AUs - New over No Project	Acres			264	392	392	1,212	392	
AUs - Piping (FS)	*LF*	*24,499*	*24,499*	*36,719*	*41,674*	*41,674*	*53,974*	*41,674*	
AU Piping - Total	LF	24,499	24,499	78,419	83,374	83,374	147,374	83,374	*Added piping for northern basin and expanded area per PG&E email of 04/11/12.*
AU Piping - New over Existing	LF		0	53,920	58,875	58,875	122,875	58,875	
AU Piping - New over No Project	LF			53,920	58,875	58,875	122,875	58,875	
AU Wells (FS)	*#*	*29*	*29*	*44*	*56*	*56*	*56*	*56*	
AU wells -Total	#	29	29	90	102	102	190	102	*Additional extraction wells per PG&E email of 04/11/12*
AU wells -New over Existing	#		0	61	73	73	161	73	
AU wells -New over No Project	#			61	73	73	161	73	
AU pumping (FS)	*gpm*	*1,100*	*1,100*	*1,270*	*2,042*	*2,829*	*2,829*	*2,042*	
AU pumping -Total	gpm	1,100	1,100	2,395	3,167	4,388	4,388	3,167	*Added pumping for nothern basin and expanded area per PG&E email of 04/11/12.*
AU pumping -New over Existing	gpm		0	1,125	1,125	1,559	1,559	1,125	
AU pumping - New over No project	gpm			1,125	1,125	1,559	1,559	1,125	
AU Pumping - net annual use	Acre-ft	911	911	2,231	2,873	2,873	6,970	2,873	Assuming irrigation demand of 5 AF/Acre/year

Table B-2: PG Hinkley Groundwater Remediation Infrastructure Quantities, Scaled Up from PG Feasibility Study/Addenda Data, 2011 - 2012 (Updates in bold 03/20/13)

Element	Units	Existing Condition	No Project	Alternative 4B	Alternative 4C-2	Alternative 4C-3	Alternative 4C-4	Alternative 4C-5	Notes
IRZ Piping(FS)	*LF*	*14,985*	*33,892*	*33,892*	*33,892*	*33,892*	*33,892*	*33,892*	
IRZ Piping -Total	LF	14,985	33,892	42,365	42,365	42,365	42,365	36,340	*Scaling Method: IRZ Piping(FS) * (1 + contingeny)*
IRZ piping -New over Existing	LF		18,907	27,380	27,380	27,380	27,380	21,355	
IRZ piping -New over No Project				8,473	8,473	8,473	8,473	2,448	
IRZ wells (FS)		*70*	*109*	*109*	*109*	*109*	*109*	*91*	
IRZ wells - Total	#	70	109	136	136	136	136	114	*Scaling Method: IRZ Wells (FS) * (1 + contingeny)*
IRZ wells - New over Existing	#		39	66	66	66	66	44	
IRZ wells - New over No Project	#			27	27	27	27	5	
IRZ injection wells (FS)		*58*	*89*	*89*	*89*	*89*	*89*	*73*	
IRZ injection wells - Total	#	58	89	111	111	111	111	91	*Scaling Method: IRZ Wells (FS) * (1 + contingeny)*
IRZ injection wells - New over Existing	#		31	53	53	53	53	33	
IRZ injection wells - New over No Project	#			22	22	22	22	2	
IRZ extraction wells (FS)		*12*	*20*	*20*	*20*	*20*	*20*	*18*	
IRZ extraction wells - Total	#	12	20	25	25	25	25	23	*Scaling Method: IRZ Wells (FS) * (1 + contingeny)*
IRZ extraction wells - New over Existing	#		8	13	13	13	13	11	
IRZ extraction wells - New over No Project	#			5	5	5	5	3	
IRZ carbon-amendment flow (FS)		*190*	*190*	*345*	*345*	*345*	*345*	*195*	
IRZ carbon-amended flow (total)	gpm	190	190	431	431	431	431	244	*Scaling Method: IRZ flow(FS) * (1 + contingency)*
IRZ carbon-amended flow (New over existing)	gpm		0	241	241	241	241	54	
IRZ carbon-amended flow (New over No Project)	gpm			241	241	241	241	54	
SCRIA dose-injection flow (FS)		*110*	*110*	*195*	*195*	*195*	*195*	*195*	
SCRIA dosed-injection flow (total)	gpm	110	110	244	244	244	244	244	*Scaling Method: IRZ flow(FS) * (1 + contingency)*
SCRIA dosed-injection flow (total) (New over existing)	gpm		0	134	134	134	134	134	
SCRIA dosed-injection flow (total) (New over No Project)	gpm			134	134	134	134	134	
SAIRZ dosed-injection flow (FS)		*80*	*80*	*150*	*150*	*150*	*150*	*0*	
SAIRZ dosed-injection flow (total)	gpm	80	80	188	188	188	188	0	*Scaling Method: IRZ flow(FS) * (1 + contingency)*
SAIRZ dosed-injection flow (total) (New over existing)	gpm		0	108	108	108	108	-80	
SAIRZ dosed-injection flow (total) (New over No Project)	gpm			108	108	108	108	-80	
IRZ recirculation flow (FS)		*83*	*83*	*223*	*223*	*223*	*223*	*223*	
IRZ recirculation flow (total)	gpm	83	83	175	175	175	175	175	*Scaling Method: IRZ flow(FS) * (1 + contingeny)*
IRZ recirculation flow (New over existing)	gpm		0	92	92	92	92	92	
IRZ recirculation flow (New over No Project)	gpm			92	92	92	92	92	
Exsitu treatment facility(FS)	*acres*	*0*	*0*	*0*	*0*	*1.86*	*0.00*	*0.86*	*assumed facility footprint unchanged (no scaling)*
Exsitu wells (FS)	*#*	*0*	*0*	*0*	*0*	*19*	*0*	*19*	
Exsitu wells - Total (All new/All new over No Project)	#					31		24	*4C-3: Scaling Method: 12 wells per PGE email ofo 4/11/12; 4C-5 - no scaling for acreage as ES used for treatment of 50 ppb which is more or less stable but addition of 25% for contingency.*
Exsitu piping (FS)	*LF*	*0*	*0*	*0*	*0*	*22,050*	*0*	*6,875*	
Exsitu piping - Total (All new and all new over No Project)	LF					41,816		8,594	*4C-3: Scaling Method: ES Piping (FS) * [(AU Acreage (Q4 2011 Plume + contingency))/AU acreage(FS)]; 4C-5 no scaling for area as ES used for treatment of 50 ppb plume which is more or less stable but addition of 25% for contingency.*
Exsitu pumping (FS) (annual)	*gpm*	*0*	*0*	*0*	*0*	*788*	*0*	*200*	
Exsitu pumping - Total (All new and all new over No Project)	gpm					1,222		200	*4C-3: Scaling Method: + 222 gpm for Northern Basin Plan, + 212 gpm for plume expansion per PGE 04/11/12 email; 4C-5 no scaling as ES used for treatment of 50 ppb plume which is more or less stables.*
FW Injection piping (FS)	*LF*	*31,886*	*31,886*	*31,886*	*31,886*	*31,886*	*31,886*	*31,886*	
FW Injection piping - Total	LF	31,886	31,886	36,669	36,669	36,669	36,669	36,669	*Scaling Method: IRZ Pumping(FS) * (1 + contingeny)*
*FW injection **/extraction** wells (FS)*	*#*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	
FW Injection**/extraction** wells -Total	#	8	8	9	9	9	9	9	*Scaling Method: IRZ Pumping(FS) * (1 + contingeny)*
FW injection flow(FS)	*gpm*	*80*	*80*	*80*	*80*	*80*	*80*	*80*	
FW Injection flow -Total	gpm	80	80	92	92	92	92	92	*Scaling Method: IRZ Pumping(FS) * (1 + contingeny)*
Monitoring Wells (FS)	*#*	***602***	***614***	***614***	***614***	***614***	***614***	***614***	
Monitoring wells - Total	#	**602**	**614**	**768**	**768**	**768**	**768**	**768**	*Scaling Method: IRZ Pumping(FS) * (1 + contingeny)*
Monitoring wells - New over Existing	#		12	**166**	**166**	**166**	**166**	**166**	
Monitoring wells - New over NP	#			**154**	**154**	**154**	**154**	**154**	

Table B-2: PG Hinkley Groundwater Remediation Infrastructure Quantities, Scaled Up from PG Feasibility Study/Addenda Data, 2011 - 2012 (Updates in bold 03/20/13)

Element	Units	Existing Condition	No Project	Alternative 4B	Alternative 4C-2	Alternative 4C-3	Alternative 4C-4	Alternative 4C-5	Notes
*Total Wells (FS, **updated with existing 03/20/13**)*	*#*	*709*	*760*	*775*	*787*	*806*	*787*	*788*	
Total Wells (Total)	#	**709**	**760**	**1,003**	**1,015**	**1,046**	**1,103**	**1,016**	*Total of wells above.*
Total Wells - New Over Existing	#		**51**	**294**	**306**	**337**	**394**	**307**	
Total Wells - New Over NP	#			**243**	**255**	**286**	**343**	**256**	
Well Supporting Acreage - FS)	*Acres*	*47*	*51*	*52*	*52*	*54*	*52*	*52*	
Well supporting acreage - Total	Acres	**47**	**51**	**67**	**68**	**70**	**73**	**68**	*Calculated from total wells (2900 SF per well)*
Well supporting - New over Existing	Acres		3	**20**	**20**	**22**	**26**	**20**	
Well supporting - New over NP	Acres			16	17	19	23	17	
Road Supporting Acreage - FS)	*Acres*		*1*	*2*	*2*	*2*	*3*	*2*	
Road supporting acreage - Total	Acres		1	3	3	6	7	4	*Calculated from scaled piping length (lf) * 0.25* 10 foot width*
Road supporting - New over Existing	Acres		1	3	3	6	7	4	
Road supporting - New over NP	Acres			2	2	5	6	3	
Piping - FS		71,370	90,277	102,497	107,452	129,502	119,752	114,327	
Wells -FS		**709**	**760**	**775**	**787**	**806**	**787**	**788**	
Piping - FS - new		0	18,907	31,127	36,082	58,132	48,382	42,957	
Wells - FS - new		0	51	66	78	97	78	79	
Ex-situ pumping		0	0	0	0	788	0	200	
Piping -Scaled		71,370	90,277	157,453	162,408	204,224	226,408	164,977	
Wells - Scaled		**709**	**760**	**1,003**	**1,015**	**1,046**	**1,103**	**1,016**	
Piping-Scaled - New		0	18,907	86,083	91,038	132,854	155,038	93,607	
Wells-Scaled - New		0	51	**294**	**306**	**337**	**394**	**307**	
Ex-situ pumping -scaled		0	0	0	0	1,222	0	200	
Piping NEW - FS/Scaling %			100.00%	277%	252%	229%	320%	218%	
Wells NEW - FS/Scaling %			100.00%	**445%**	**392%**	**347%**	**505%**	**389%**	
Ex-situ pumping %						155%		100%	

Table B-3: PG and E Hinkley Groundwater Remediation, No Project Alternative, Remedial Infrastructure Based on Feasibility Study, Addendum Data, 2011 - 2012 (Updates in bold, 03/20/13)

Element	Units	Initial	Year 5- 10	Year 10 - 20	20+
AUs (total)	Acres	182	182	182	182
AUs (New in period)	Acres	0	0	0	0
AUs Piping (total)	LF	24,499	24,499	24,499	24,499
AUs Piping (New in period)	LF	0	0	0	0
AU wells (total)	#	29	29	29	29
AU wells (New in period)	#	0	0	0	0
AU pumping (total)	gpm	1,100	1,100	1,100	1,100
AU pumping (change in period)	gpm	0	0	0	0
IRZ piping (total)	LF	31,392	31,992	33,892	33,892
IRZ piping (New in period)	LF	16,407	600	1,900	0
IRZ wells (total)	#	103	103	109	109
IRZ wells (New in period)	#	33	0	6	0
IRZ injection wells (total)	#	86	86	89	89
IRZ injection wells (New in period)	#	28	0	3	0
IRZ extraction wells (total)	#	17	17	20	20
IRZ extraction wells (New in period)	#	5	0	3	0
IRZ dosed injection flow (total)	gpm	190	190	190	190
IRZ dosed injection flow (New in period)	gpm	0	0	0	0
SCRIA dosed-injection flow (total)	gpm				
SCRIA dosed-injection flow (New in period)	gpm				
SAIRZ dosed-injection flow (total)	gpm				
SAIRZ dosed-injection flow (New in period)	gpm				
IRZ CAIRZ recirculation flow (total)	gpm	83	83	83	83
IRZ recirculation flow (New in period)	gpm	0	0	0	0
Exsitu wells	#				
Exsitu piping	LF				
Exsitu flow	gpm				
FW Injection piping	LF	31,886	31,886	31,886	31,886
FW Injection**/extraction** wells	#	8	8	8	8
FW Injection flow	gpm	80	80	80	80
Monitoring wells (total)	#	**614**	**614**	**614**	**614**
Monitoring wells (New in period)	#	12	0	0	0
All wells (total)	#	**754**	**754**	**760**	**760**
All wells (New in period)	#	125	80	86	80
Well supporting acreage	Acres	**50**	**50**	**51**	**51**
Well supporting acreage (New in period)	Acres	8	5	6	5
Road supporting acreage	Acres	0.94	0.98	1.09	1.09
Road supporting acreage (New in period)	Acres	0.94	0.03	0.11	0.00

Table B-4: PG and E Hinkley Groundwater Remediation, Alternative 4B, Remedial Infrastructure Based on Feasibility Study, Addendum Data, 2011 - 2012 (Updates in Bold, 03/20/13)

Element	Units	Existing	Initial	Year 5- 10	Year 10 - 20	20+	Total	Scaler	Initial (S)	Year 5- 10 (S)	Year 10-20 (S)	20+ (S)
AUs (total)	Acres	182	222	222	222	222	222		446	446	446	446
AUs (New in period)	Acres	0	40	0	0	0	40	201%	264	0	0	0
AUs Piping (total)	LF	24,499	27,649	27,649	36,719	36,719	36,719		59,049	59,049	78,419	78,419
AUs Piping (New in period)	LF	0	3,150	0	9,070	0	12,220	214%	34,550	0	19,370	0
AU wells (total)	#	29	32	32	44	44	44		65	65	90	90
AU wells (New in period)	#	0	3	0	12	0	15	205%	36	0	25	0
AU pumping (total)	gpm	1,100	1,270	1,270	1,270	1,270	1,270		2,395	2,395	2,395	2,395
AU pumping (change in period)	gpm	0	170	0	0	0	170	189%	1,295	0	0	0
IRZ piping (total)	LF	14,985	31,392	31,992	33,892	33,892	33,892		39,240	39,990	42,365	42,365
IRZ piping (New in period)	LF	0	16,407	600	1,900	0	18,907	125%	24,255	750	2,375	0
IRZ wells (total)	#	70	103	103	109	109	109		129	129	136	136
IRZ wells (New in period)	#	0	33	0	6	0	39		59	0	8	0
IRZ injection wells (total)	#	58	86	86	89	89	89		108	108	111	111
IRZ injection wells (New in period)	#	0	28	0	3	0	31	125%	50	0	4	0
IRZ extraction wells (total)	#	12	17	17	20	20	20		21	21	25	25
IRZ extraction wells (New in period)	#	0	5	0	3	0	8	125%	9	0	4	0
IRZ dosed injection flow (total)	gpm	190	345	195	255	170			431	244	319	213
IRZ dosed injection flow (New in period)	gpm	0	155	-150	60	-85	-20	125%	241	-188	75	-106
SCRIA dosed-injection flow (total)	gpm		195						244			
SCRIA dosed-injection flow (New in period)	gpm		195				195	125%	244			
SAIRZ dosed-injection flow (total)	gpm		150						188			
SAIRZ dosed-injection flow (New in period)	gpm		150				150	125%	188			
IRZ CAIRZ recirculation flow (total)	gpm	83	223	223	223	223			**175**	**175**	**175**	**175**
IRZ recirculation flow (New in period)	gpm	0	140	0	0	0	140	125%	**92**	0	0	0
Exsitu wells	#											
Exsitu piping	LF											
Exsitu flow	gpm											
FW Injection piping	LF	31,886	31,886	31,886	31,886	31,886	31,886	115%	36,669	36,669	36,669	36,669
FW Injection**/extraction** wells	#	8	8	8	8	8	8	115%	9	9	9	9
FW Injection flow	gpm	80	80	80	80	80	80	115%	92	92	92	92
Monitoring wells (total)	#	**602**	**614**	**614**	**614**	**614**	**614**		**768**	**768**	**768**	**768**
Monitoring wells (New in period)	#	0	12	0	0	0	12	125%	**166**	0	0	0
All wells (total)	#	**709**	**757**	**757**	**775**	**775**	**775**		**971**	**971**	**1,003**	**1,003**
All wells (New in period)	#	0	48	0	18	0	66		**261**	0	32	0
Well supporting acreage	Acres	**47**	**50**	**50**	**52**	**52**	**52**		**65**	**65**	**67**	**67**
Well supporting acreage (New in period)	Acres	0	3	0	1	0	4		**17**	0	2	0
Road supporting acreage	Acres		1.12	1.16	1.79	1.79	1.79		3.37	3.42	4.67	4.67
Road supporting acreage (New in period)	Acres		1.12	0.03	0.63	0.00	1.79		3.37	0.04	1.25	0.00

Table B-5: PG and E Hinkley Groundwater Remediation, Alternative 4C-2, Remedial Infrastructure Based on Feasibility Study, Addendum Data, 2011 - 2012 (Updates in bold 03/20/12)

Element	Units	Existing	Initial	Year 5- 10	Year 10 - 20	20+	Total	Scaler	Initial (S)	Year 5- 10 (S)	Year 10-20 (S)	20+ (S)
AUs (total)	Acres	182	351	351	351	351	351		575	575	575	575
AUs (New in period)	Acres	0	168	0	0	0	168	164%	392	0	0	0
AUs Piping (total)	LF	24,499	34,234	34,234	41,674	41,674	41,674		68,489	68,489	83,374	83,374
AUs Piping (New in period)	LF	0	9,735	0	7,440	0	17,175	200%	43,990	0	14,885	0
AU wells (total)	#	29	44	44	56	56	56		80	80	102	102
AU wells (New in period)	#	0	15	0	12	0	27	182%	51	0	22	0
AU pumping (total)	gpm	1,100	2,042	2,042	2,042	1,688	2,042		3,167	3,167	3,167	3,167
AU pumping (change in period)	gpm	0	942	0	0	-354	588	155%	2,067	0	0	0
IRZ piping (total)	LF	14,985	31,392	31,992	33,892	33,892	33,892		39,240	39,990	42,365	42,365
IRZ piping (New in period)	LF	0	16,407	600	1,900	0	18,907	125%	24,255	750	2,375	0
IRZ wells (total)	#	70	103	103	109	109	109		129	129	136	136
IRZ wells (New in period)	#	0	33	0	6	0	39		59	0	8	0
IRZ injection wells (total)	#	58	86	86	89	89	89		108	108	111	111
IRZ injection wells (New in period)	#	0	28	0	3	0	31	125%	50	0	4	0
IRZ extraction wells (total)	#	12	17	17	20	20	20		21	21	25	25
IRZ extraction wells (New in period)	#	0	5	0	3	0	8	125%	9	0	4	0
IRZ dosed injection flow (total)	gpm	190	345	195	255	170	345		431	244	319	213
IRZ dosed injection flow (New in period)	gpm	0	155	-150	60	-85	-20	125%	241	-188	75	-106
SCRIA dosed-injection flow (total)	gpm		195						244			
SCRIA dosed-injection flow (New in period)	gpm		195				195	125%	244			
SAIRZ dosed-injection flow (total)	gpm		150						188			
SAIRZ dosed-injection flow (New in period)	gpm		150				150	125%	188			
IRZ CAIRZ recirculation flow (total)	gpm	83	223	223	223	223	223		**175**	**175**	**175**	**0**
IRZ recirculation flow (New in period)	gpm	0	140	0	0	0	140	125%	**92**	0	0	**-175**
Exsitu wells	#											
Exsitu piping	LF											
Exsitu flow	gpm											
FW Injection piping	LF	31,886	31,886	31,886	31,886	31,886	31,886	115%	36,669	36,669	36,669	36,669
FW Injection**/extraction** wells	#	8	8	8	8	8	8	115%	9	9	9	9
FW Injection flow	gpm	80	80	80	80	80	80	115%	92	92	92	92
Monitoring wells (total)	#	**602**	**614**	**614**	**614**	**614**	**614**		**768**	**768**	**768**	**768**
Monitoring wells (New in period)	#	0	12	0	0	0	12	125%	**166**	0	0	0
All wells (total)	#	709	**769**	**769**	**787**	**787**	**787**		**986**	**986**	**1,015**	**1,015**
All wells (New in period)	#	0	60	0	18	0	78		**275**	0	29	0
Well supporting acreage	Acres	**47**	**51**	**51**	**52**	**52**	**52**		**66**	**66**	**68**	**68**
Well supporting acreage (New in period)	Acres	0	4	0	1	0	5		**18**	0	2	0
Road supporting acreage	Acres		1.50	1.53	2.07	2.07	2.07		3.92	3.96	4.95	4.95
Road supporting acreage (New in period)	Acres		1.50	0.03	0.54	0.00	2.07		3.92	0.04	0.99	0.00

Table B-6: PG and E Hinkley Groundwater Remediation, Alternative 4C-3, Remedial Infrastructure Based on Feasibility Study, Addendum Data, 2011 - 2012 (Updates in bold, 03/20/13)

Element	Units	Existing	Initial	Year 5- 10	Year 10 - 20	20+	Total	Scaler	Initial (S)	Year 5- 10 (S)	Year 10-20 (S)	20+ (S)
AUs (total)	Acres	182	351	351	351	351	351		575	575	575	575
AUs (New in period)	Acres	0	168	0	0	0	168	164%	392	0	0	0
AUs Piping (total)	LF	24,499	36,364	36,364	41,674	41,674	41,674		72,751	72,751	83,374	83,374
AUs Piping (New in period)	LF	0	11,865	0	5,310	0	17,175	200%	48,252	0	10,623	0
AU wells (total)	#	29	44	44	56	56	56		80	80	102	**102**
AU wells (New in period)	#	0	15	0	12	0	27	182%	51	0	22	**1**
AU pumping (total)	gpm	1,100	2,829	2,829	2,829	2,325	2,829		4,388	4,388	4,388	3,606
AU pumping (change in period)	gpm	0	1,729	0	0	-504	1,225	155%	3,288	0	0	-782
IRZ piping (total)	LF	14,985	31,392	31,992	33,892	33,892	33,892		39,240	39,990	42,365	42,365
IRZ piping (New in period)	LF	0	16,407	600	1,900	0	18,907	125%	24,255	750	2,375	0
IRZ wells (total)	#	70	106	106	112	112	112		129	129	136	136
IRZ wells (New in period)	#	0	36	0	6	0	42		59	0	8	0
IRZ injection wells (total)	#	58	86	86	89	89	89		108	108	111	111
IRZ injection wells (New in period)	#	0	28	0	3	0	31	125%	50	0	4	0
IRZ extraction wells (total)	#	12	20	20	23	23	23		**21**	**21**	25	25
IRZ extraction wells (New in period)	#	0	8	0	3	0	11	109%	**9**	0	4	0
IRZ dosed injection flow (total)	gpm	190	345	195	255	170	345		431	244	319	213
IRZ dosed injection flow (New in period)	gpm	0	155	-150	60	-85	-20	125%	241	-188	75	-106
SCRIA dosed-injection flow (total)	gpm		195						244			
SCRIA dosed-injection flow (New in period)	gpm		195				195	125%	244			
SAIRZ dosed-injection flow (total)	gpm		150						188			
SAIRZ dosed-injection flow (New in period)	gpm		150				150	125%	188			
IRZ CAIRZ recirculation flow (total)	gpm	83	223	223	223	223	223		**175**	**175**	**175**	**0**
IRZ recirculation flow (New in period)	gpm	0	140	0	0	0	140	125%	**92**	0	0	**-175**
Exsitu wells	#		19	19	19	19	19	190%	31	31	31	31
Exsitu piping	LF		22,050	22,050	22,050	22,050	22,050	190%	41,816	41,816	41,816	41,816
Exsitu flow (annual avg.)	gpm		788	788	788	638	788		1,222	1,222	1,222	1,222
FW Injection piping	LF	31,886	31,886	31,886	31,886	31,886	31,886	115%	36,669	36,669	36,669	36,669
FW Injection**/extraction** wells	#	8	8	8	8	8	8	115%	9	9	9	9
FW Injection flow	gpm	80	80	80	80	80	80	115%	92	92	92	92
Monitoring wells (total)	#	**602**	**614**	**614**	**614**	**614**	**614**		**768**	**768**	**768**	**768**
Monitoring wells (New in period)	#	0	12	0	0	0	12	125%	**166**	0	0	0
All wells (total)	#	**709**	**791**	**791**	**809**	**809**	**809**		**1,016**	**1,016**	**1,046**	**1,046**
All wells (New in period)	#	0	82	19	37	19	100		**306**	0	**30**	**1**
Well supporting acreage	Acres	**47**	**53**	**53**	**54**	**54**	**54**		**68**	**68**	**70**	**70**
Well supporting acreage (New in period)	Acres	0	5	1	2	1	10		**20**	0	**2**	0
Road supporting acreage	Acres		2.89	4.19	5.87	7.13	7.13		6.56	9.00	12.15	14.55
Road supporting acreage (New in period)	Acres		2.89	1.30	1.68	1.27	7.13		6.56	2.44	3.15	2.40

Table B-7: PG and E Hinkley Groundwater Remediation, Alternative 4C-4, Remedial Infrastructure Based on Feasibility Study, Addendum Data, 2011 - 2012 (Updates in bold, 03/20/13)

Element	Units	Existing	Initial	Year 5- 10	Year 10 - 20	20+	Total	Scaler	Initial (S)	Year 5- 10 (S)	Year 10-20 (S)	20+ (S)
AUs (total)	Acres	182	895	895	895	895	895		1,394	1,394	1,394	1,394
AUs (New in period)	Acres	0	713	0	0	0	713	156%	1,212	0	0	0
AUs Piping (total)	LF	24,499	48,664	48,664	53,974	53,974	53,974		132,875	132,875	147,374	147,374
AUs Piping (New in period)	LF	0	24,165	0	5,310	0	29,475	273%	108,376	0	14,499	0
AU wells (total)	#	29	44	44	56	56	56		149	149	190	190
AU wells (New in period)	#	0	15	0	12	0	27	339%	120	0	41	0
AU pumping (total)	gpm	1,100	2,829	2,829	2,829	2,325	2,829		4,388	4,388	4,388	4,388
AU pumping (change in period)	gpm	0	1,729	0	0	-504	1,225	155%	3,288	0	0	0
IRZ piping (total)	LF	14,985	31,392	31,992	33,892	33,892	33,892		39,240	39,990	42,365	42,365
IRZ piping (New in period)	LF	0	16,407	600	1,900	0	18,907	125%	24,255	750	2,375	0
IRZ wells (total)	#	70	106	106	112	112	112		129	129	136	136
IRZ wells (New in period)	#	0	36	0	6	0	42		59	0	8	0
IRZ injection wells (total)	#	58	86	86	89	89	89		108	108	111	111
IRZ injection wells (New in period)	#	0	28	0	3	0	31	125%	50	0	4	0
IRZ extraction wells (total)	#	12	20	20	23	23	23		**21**	**21**	25	25
IRZ extraction wells (New in period)	#	0	8	0	3	0	11	109%	**9**	0	4	0
IRZ dosed injection flow (total)	gpm	190	345	195	255	170	345		431	244	319	213
IRZ dosed injection flow (New in period)	gpm	0	155	-150	60	-85	-20	125%	241	-188	75	-106
SCRIA dosed-injection flow (total)	gpm		195						244			
SCRIA dosed-injection flow (New in period)	gpm		195				195	125%	244			
SAIRZ dosed-injection flow (total)	gpm		150						188			
SAIRZ dosed-injection flow (New in period)	gpm		150				150	125%	188			
IRZ CAIRZ recirculation flow (total)	gpm	83	223	223	223	223	223		**175**	**175**	**175**	**175**
IRZ recirculation flow (New in period)	gpm	0	140	0	0	0	140	125%	**92**	0	0	0
Exsitu wells	#											
Exsitu piping	LF											
Exsitu flow	gpm											
FW Injection piping	LF	31,886	31,886	31,886	31,886	31,886	31,886	115%	36,669	36,669	36,669	36,669
FW Injection**/extraction** wells	#	8	8	8	8	8	8	115%	9	9	9	9
FW Injection flow	gpm	80	80	80	80	80	80	115%	92	92	92	92
Monitoring wells (total)	#	**602**	**614**	**614**	**614**	**614**	**614**		**768**	**768**	**768**	**768**
Monitoring wells (New in period)	#	0	12	0	0	0	12	125%	**166**	0	0	0
All wells (total)	#	**709**	**772**	**772**	**790**	**790**	**790**		**1,054**	**1,054**	**1,103**	**1,103**
All wells (New in period)	#	0	63	0	18	0	81		**344**	0	48	0
Well supporting acreage	Acres	**47**	**51**	**51**	**53**	**53**	**53**		**70**	**70**	**73**	**73**
Well supporting acreage (New in period)	Acres	0	4	0	1	0	5		**23**	0	3	0
Road supporting acreage	Acres		2.33	2.36	2.78	2.78	2.78		7.61	7.66	8.62	8.62
Road supporting acreage (New in period)	Acres		2.33	0.03	0.41	0.00	2.78		7.61	0.04	0.97	0.00

Table B-8: PG and E Hinkley Groundwater Remediation, Alternative 4C-5, Remedial Infrastructure Based on Feasibility Study, Addendum Data, 2011 - 2012 (Updates in bold, 03/20/13)

Element	Units	Existing	Initial	Year 5- 10	Year 10 - 20	20+	Total	Scaler	Initial (S)	Year 5- 10 (S)	Year 10-20 (S)	20+ (S)
AUs (total)	Acres	182	351	351	351	351	351		575	575	575	575
AUs (New in period)	Acres	0	168	0	0	0	168	164%	392	0	0	0
AUs Piping (total)	LF	24,499	34,234	34,234	41,674	41,674	41,674		68,489	68,489	83,374	83,374
AUs Piping (New in period)	LF	0	9,735	0	7,440	0	17,175	200%	43,990	0	14,885	0
AU wells (total)	#	29	44	44	56	56	56		80	80	102	102
AU wells (New in period)	#	0	15	0	12	0	27	182%	51	0	22	0
AU pumping (total)	gpm	1,100	2,042	2,042	2,042	1,688	1,688		3,167	3,167	3,167	2,618
AU pumping (change in period)	gpm	0	942	0	0	-354	588		2,067	0	0	-549
IRZ piping (total)	LF	14,985	27,152	27,752	29,652	29,652	29,652		33,940	34,690	36,340	36,340
IRZ piping (New in period)	LF	0	**12,167**	600	1,900	0	14,667	123%	18,955	750	1,650	0
IRZ wells (total)	#	70	87	87	91	91	91		111	111	114	114
IRZ wells (New in period)	#	0	17	0	4	0	21		41	0	3	0
IRZ injection wells (total)	#	58	72	72	73	73	73		90	90	91	91
IRZ injection wells (New in period)	#	0	14	0	1	0	15	125%	32	0	1	0
IRZ extraction wells (total)	#	12	15	15	18	18	18		**21**	**21**	23	23
IRZ extraction wells (New in period)	#	0	3	0	3	0	6	125%	**9**	0	**2**	0
IRZ dosed injection flow (total)	gpm	190	195	195	255	170	195		244	244	319	213
IRZ dosed injection flow (New in period)	gpm	0	5	0	60	-85	-20	125%	54	0	75	-106
SCRIA dosed-injection flow (total)	gpm		195						244			
SCRIA dosed-injection flow (New in period)	gpm		85		60	-85	60	125%	49			
SAIRZ dosed-injection flow (total)	gpm								0			
SAIRZ dosed-injection flow (New in period)	gpm						0	125%	0			
IRZ CAIRZ recirculation flow (total)	gpm	83	223	223	223	223	223		**175**	**175**	**175**	**0**
IRZ recirculation flow (New in period)	gpm	0	140	0	0	0	140	125%	**92**	0	0	**-175**
Exsitu wells	#		16	16	19	19	19		**16**	**16**	**19**	**19**
Exsitu wells (New in period)	gpm		16	0	3	0	19	100%	**16**	0	**3**	0
Exsitu piping	LF		6,175	6,175	6,875	6,875	6,875		7,719	7,719	8,594	8,594
Exsitu piping (New in period)	gpm		6,175	0	700	0	6,875	125%	7,719	0	875	0
Exsitu flow	gpm		200	200	200	0	0		200	200	200	**250**
Exsitu flow (New in Period)	gpm		200	0	0	-200	0	100%	200	0	0	**0**
FW Injection piping	LF	31,886	31,886	31,886	31,886	31,886	31,886	115%	36,669	36,669	36,669	36,669
FW Injection**/extraction** wells	#	8	8	8	8	8	8	115%	9	9	9	9
FW Injection flow	gpm	80	80	80	80	80	80	115%	92	92	92	92
Monitoring wells (total)	#	**602**	**614**	**614**	**614**	**614**	**614**		**768**	**768**	**768**	**768**
Monitoring wells (New in period)	#	0	12	0	0	0	12	125%	**166**	0	0	0
All wells (total)	#	**709**	**769**	**769**	**788**	**788**	**788**		**984**	**984**	**1,011**	**1,011**
All wells (New in period)	#	0	60	0	19	0	79		**274**	0	**28**	0
Well supporting acreage	Acres	**47**	**51**	**51**	**52**	**52**	**52**		**65**	**65**	**67**	**67**
Well supporting acreage (New in period)	Acres	0	4	0	1	0	5		**18**	0	2	0
Road supporting acreage	Acres		1.61	1.65	2.22	2.22	2.22		4	4	5	5
Road supporting acreage (New in period)	Acres		1.61	0.03	0.58	0.00	2.22		4	0	1	0

Appendix C
Biological Resources Report

BIOLOGICAL RESOURCES REPORT

HINKLEY GROUNDWATER REMEDIATION PROJECT SAN BERNARDINO COUNTY, CALIFORNIA

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March 2013

ICF International. 2013 . *Biological Report, Hinkley Groundwater Remediation Project, San Bernardino County, California.* Appendix C of the Draft Environmental Impact Report for the Groundwater Cleanup Strategy for Historical Chromium Discharges from PG&E's Hinkley Compressor Station (ICF 00122.11). ICF Redlands, CA. March. Prepared for California Regional Water Quality Board Lahontan Region.

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Acronyms and Abbreviations

ACEC	Areas of Critical Environmental Concern
AMSL	above mean sea level
BLM	U.S. Bureau of Land Management
BSA	biological survey area
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
chromium 6, Cr6	hexavalent chromium
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
RWQCB	California Regional Water Quality Control Board
DWMA	Desert Wildlife Management Area
EIR	Environmental Impact Report
ESA	Endangered Species Act
HCP	Habitat Conservation Plan
ICF	ICF International
MBTA	Migratory Bird Treaty Act
mph	miles per hour
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NRCS	Natural Resources Conservation Service
PG&E	Pacific Gas and Electric Company
SR	State Road
SSC	species of special concern
station	PG&E Hinkley Compressor Station
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Chapter 1
Project Information

This Biological Resources Report is being prepared to evaluate the potential special-status biological resources that may be present in potential groundwater remedial action areas for remediation of chromium plume related to the PG&E Hinkley Compressor Station. This report contains the results of a biological literature search, vegetation mapping, and special-status species habitat assessment conducted by ICF International (ICF) for the 32,159 ~~21,032~~-acre biological study area (BSA) located in the community of Hinkley, San Bernardino County, California. Biological resources have been evaluated that pertain to the federal Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), California Endangered Species Act (CESA), and the California Fish and Game Code (e.g., protected species).

Judgments regarding likelihood of occurrence are based on evaluation of available biological information regarding regional and local conditions, species biology, available evaluations of the study area and vicinity, and professional experience conducting field investigations.

1.1 Project Location

The BSA is located on approximately 32,159 ~~21,032~~ acres of land within the unincorporated community of Hinkley, California, with a small area extending into the city limits of Barstow (Figures 1 and 2). Regionally, the BSA is located northwest of Interstate 15 and is intersected by Highway 58. Specifically, the site is located north of the southern bank of the Mojave River, east of Valley View Road, west of Western Drive, and south of Fossil Bed Road ~~between Hinkley Road and a portion of Highway 58 approximately 1.75 miles northwest of the intersection of Interstate 15 and Highway 58~~. The site is dominated by private property but also includes some lands managed by the Bureau of Land Management (BLM) as well as the Caltrans right-of-way for Highway 58.

The site is in the following Townships, Ranges, and Quads of California, U.S. Geological Survey (USGS) 7.5-minute quadrangle maps (Figure 3): Township 9 North, Range 3 West, ~~and~~ Township 10 North, Range 3 West and Township 11 North, Range 3 West of *Hinkley* (U.S. Geological Survey 1971a); Township 9 North, Range 2 West and Township 10 North, Range 2 West of *Barstow* (U.S. Geological Survey 1971b); and Township 11 North, Range 3 West of *Water Valley* (U.S. Geological Survey 1988).

1.2 Project Description

The chromium plume associated with the prior use of chromium at the PG&E Hinkley Compressor Station (station) is the subject of groundwater investigation and cleanup activities being directed by the California Regional Water Quality Control Board (RWQCB), Lahontan Region. The Hinkley Compressor Station, located approximately eight miles west of Barstow in San Bernardino County, pressurizes natural gas to facilitate its transport (flow) to Northern California. In the 1950s and 1960s, PG&E used and discharged water containing hexavalent chromium (chromium 6 or Cr6), which entered groundwater beneath the station. A plume of contaminated groundwater has been

defined and characterized (California Regional Water Quality Control Board 2011). Under the direction of the RWQCB, investigative and remedial activities have been underway for a number of years to characterize the plume, define its boundaries and remediate the plume.

To remediate the contaminated aquifer, and satisfy the requirements of the California Environmental Quality Act, the RWQCB is considering a range of alternatives to be implemented by PG&E to affect cleanup of the groundwater. As of late 2011—according to Addendum #3 to the Feasibility Study (Haley and Aldrich 2011)—more than 500~~300~~ monitoring wells, 30 extraction wells, and six treatment systems have been installed.

A range of remedial measures that involve various configurations of aboveground and belowground treatment will likely be proposed. These measures will likely require installation of wells, pipelines aboveground treatment systems and agricultural land treatment units. The entire range of alternatives will be described as part of the Environmental Impact Report (EIR) in preparation.

Although the exact configuration of remedial measures is not yet known, the treatment alternatives could be dispersed within~~over~~ OU1, OU2 and OU3 (approximately 30,174 acres in total but the actual remedial areas will be much smaller than the total area) ~~12 square miles~~—the area of land above and adjacent to the contaminated groundwater plume.

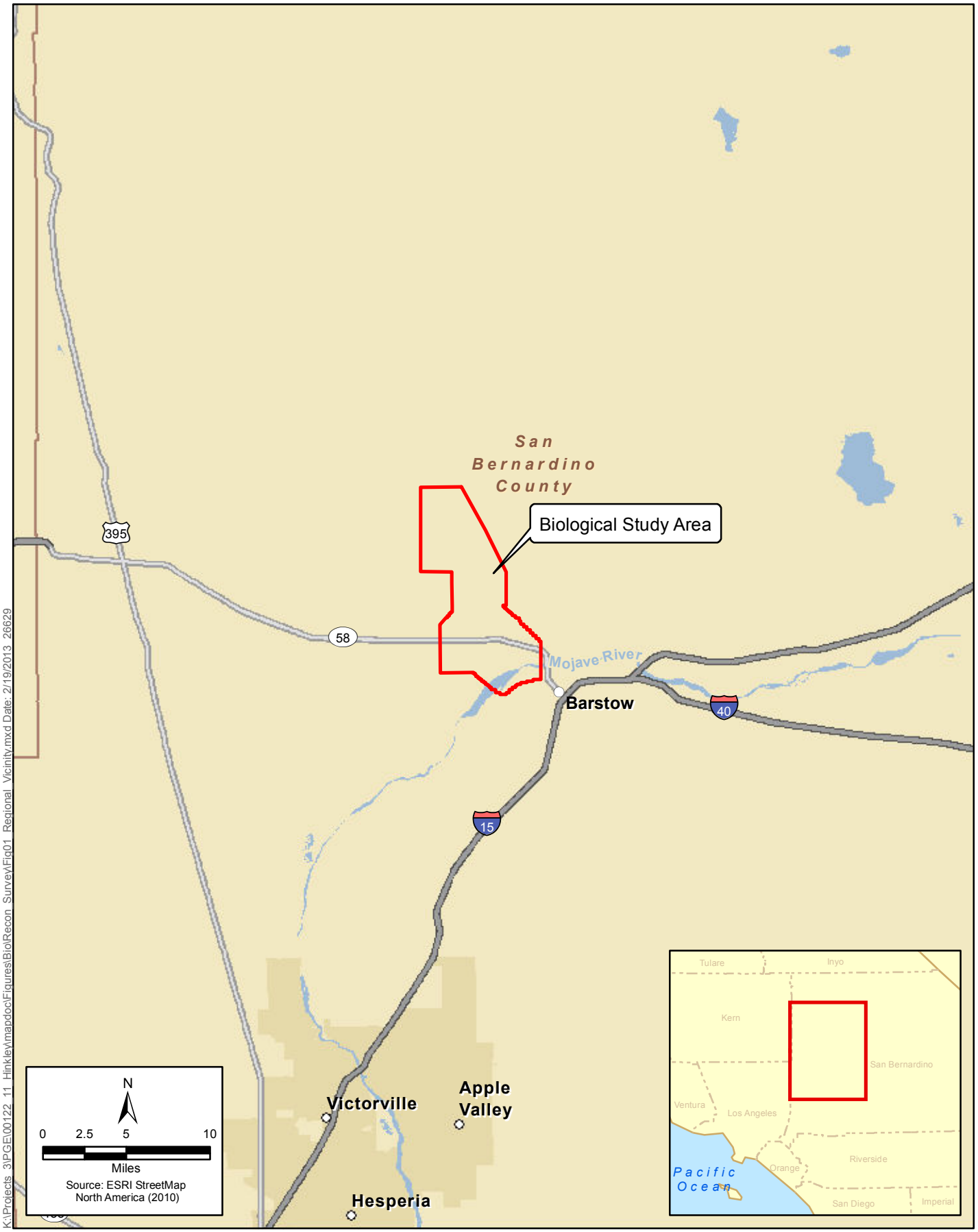

Figure 1
Regional Vicinity Map
Biological Resources Report
Hinkley Groundwater Remediation Project

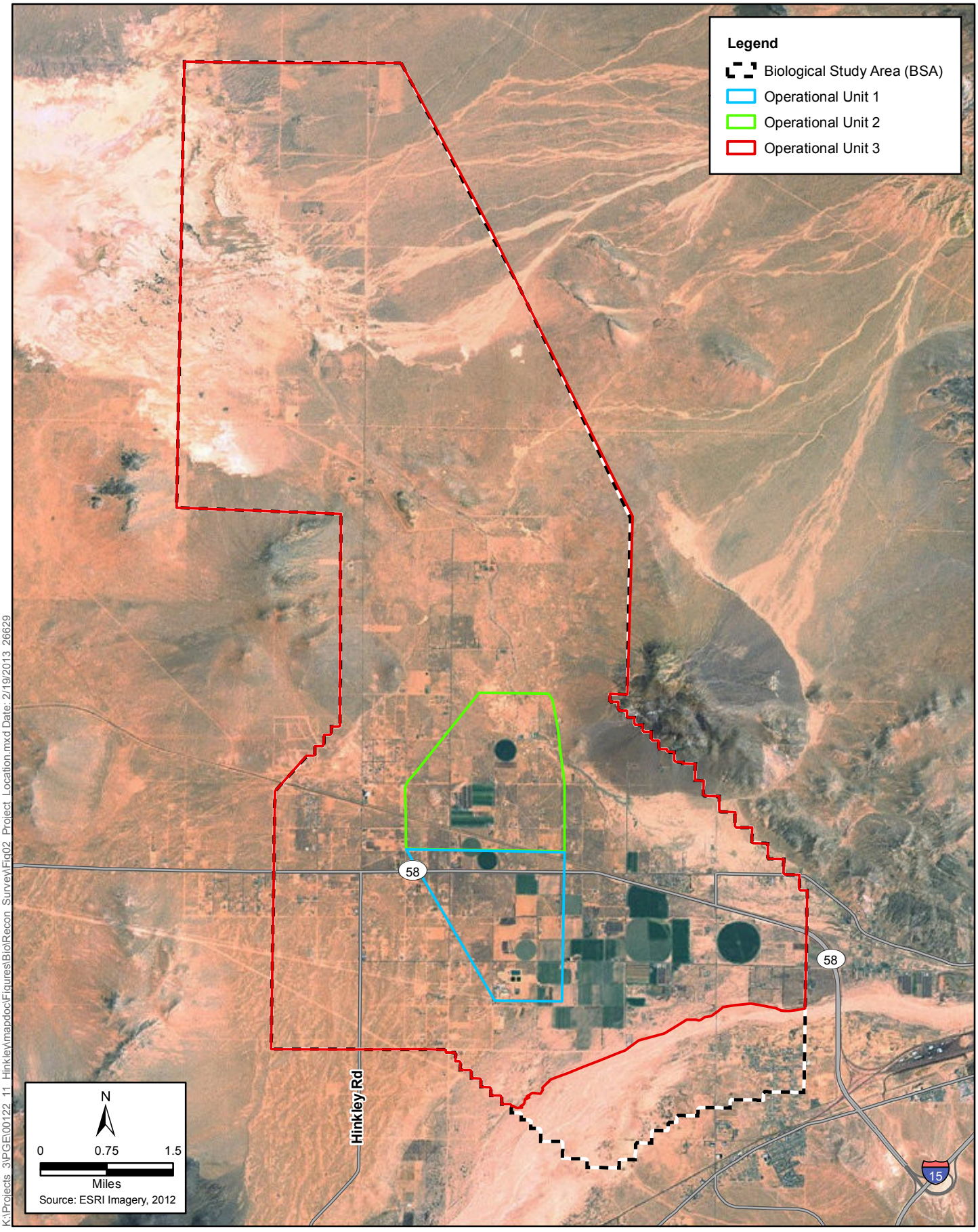

Figure 2
Project Location
Biological Resources Report
Hinkley Groundwater Remediation Project

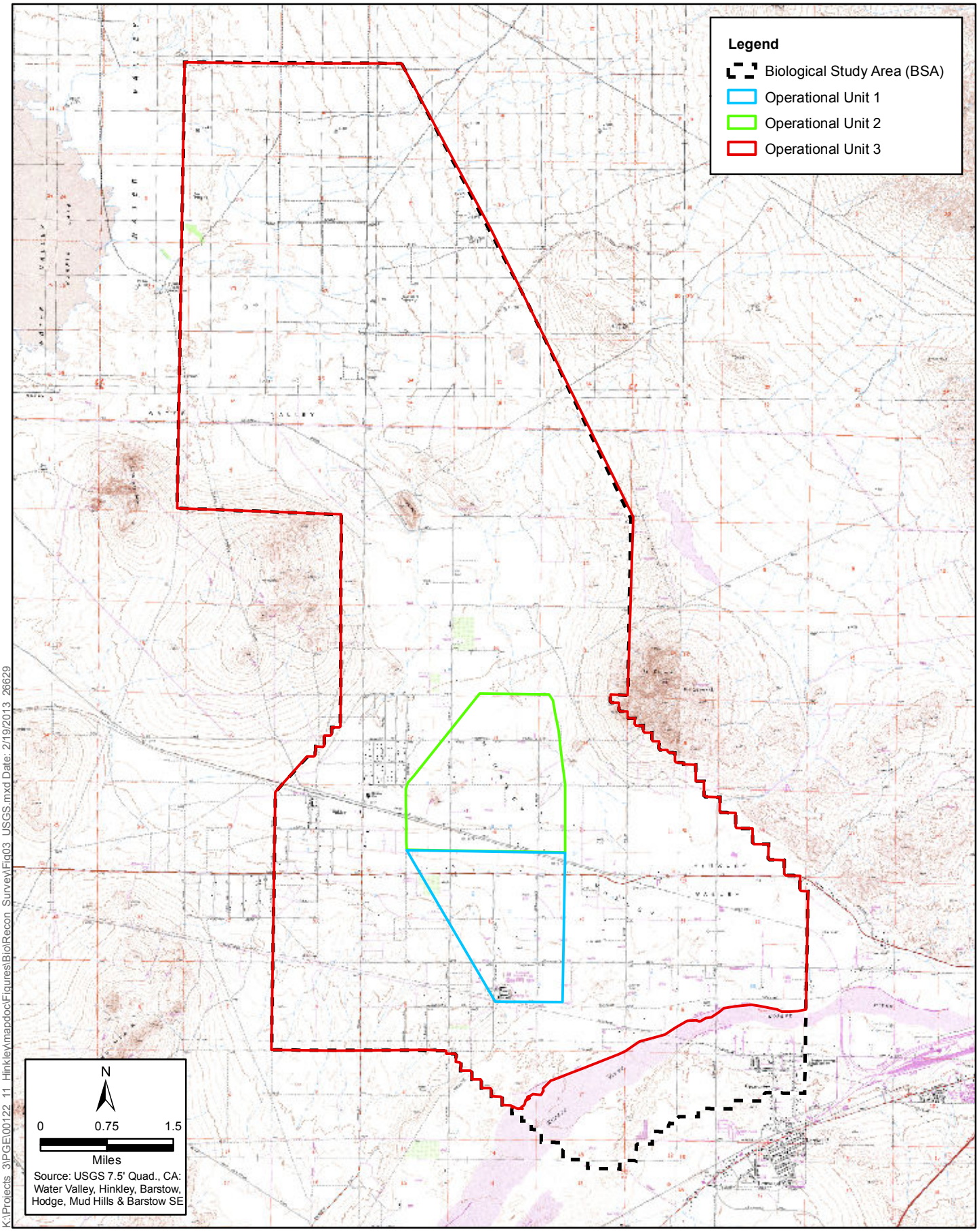

Figure 3
USGS Map
Biological Resources Report
Hinkley Groundwater Remediation Project

Chapter 2
Methodology

2.1 Literature Review

A comprehensive literature review was conducted to evaluate the environmental setting of the BSA and identify potential special-status species that may be found on the site. The review included a search of the California Natural Diversity Database (CNDDB) (California Department of Fish and Game 2013~~1~~a) and the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (California Native Plant Society 2013~~1~~) for the Hinkley, Barstow, Barstow SE, Bird Spring, Opal Mountain, Superior Lake, Mud Hills, Water Valley, Lockhart, Twelve Gauge Lake, Wild Crossing, and Hodge 7.5-minute USGS quadrangles. Additionally, literature detailing the habitat requirements of special-status species and the most recent U.S. Fish and Wildlife Service (USFWS) critical habitat maps were reviewed (U.S. Fish and Wildlife Service 2011b, 2013).

For this report, special-status species are those that are (1) listed, proposed for listing, or candidates for listing under the federal ESA as threatened or endangered; (2) listed or candidates for listing under the CESA as threatened or endangered; (3) listed as rare under the Native Plant Protection Act; (4) a state species of special concern or fully protected species; ~~or~~ (5) plant species designated by the CNPS as a California Rare Plant Rank (CRPR) 1A, 1B, or 2 species; or (6) listed as BLM sensitive.

In addition, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA/NRCS 2013~~U.S. Department of Agriculture / Natural Resources Conservation Service 2011~~) was reviewed for the BSA. The soil data was then evaluated for the potential to support rare vegetation communities, plants, and/or wildlife.

2.2 Field Investigation

An initial site visit was conducted for the southern portion of the project on December 20, 2011; and a second site visit was conducted focusing on the northern portion of the project on January 14, 2013. Table 1 provides pertinent time and weather information regarding the biological surveys. ~~A site visit was conducted on December 20, 2011 by ICF Biologists Mikael Romich, Phil Richards, Paul Schwartz, and Lisa Franklin. The site visit was conducted between 8 a.m. and 5 p.m. Weather conditions during the site visit consisted of temperatures ranging from 7.2° to 13.3° Celsius (45° to 56° Fahrenheit), winds ranging from 0–3 miles per hour (mph) with partly cloudy to clear skies, and good visibility.~~

Table 1. Site Survey Information

Date	Personnel	Time	Weather Conditions
December 20, 2011	Mikael Romich Lisa Franklin Phil Richards Paul Schwartz	08:00 to 17:00	7.2 to 13.3˚C (45–56˚F), winds ranging from 0–3 miles per hour (mph), partly cloudy to clear skies with good visibility.
January 14, 2013	Phil Richards Paul Schwartz	08:30 to 17:00	2.2–5.5˚C (28–42˚F), winds ranging from 0–3 mph, clear skies with good visibility.

The site visits focused on mapping vegetation and conducting habitat assessments for special-status plants and wildlife. Photographs of the site are provided in Attachment A.

The BSA was evaluated for the presence, absence, or likelihood of occurrence of special-status species and vegetation types, and for more general biological resource issues potentially posing a constraint to the project through applicable laws and regulations. Focused surveys for plants or wildlife were not performed during this site visit. Parameters evaluated for special-status plants included topography, soil conditions, elevation, hydrology, the site's operational activities, and life history needs for the specific species. Special-status parameters for wildlife included connectivity to documented and potentially occurring habitat, hydrology, access to the site, foraging and nesting habitat, the site's operational activities, and life history needs for each species.

All plant and wildlife species observed during the site visit were recorded in field notes. Plants were detected and identified through direct sight. Plants were identified to species based on previous experience with the species or identified to species using *A Field Guide to the Plants of Arizona* (Epple 1995) and *The Jepson Desert Manual: Vascular Plants of Southeastern California* (Baldwin et. al. 2002). Special-status rankings for plant species were identified through a review of the CDFG Special Plants, Bryophytes, and Lichens List (California Department of Fish and Game 20132011b). Wildlife species were detected by sight, calls, tracks, scat, or other sign. Field guides were used to assist with identification of species during the site visit. Special-status rankings for wildlife were identified through a review of the CDFG Special Animals List (California Department of Fish and Game 2011c).

2.2.1 Vegetation Mapping

Initial vVegetation mapping was conducted in 2011 in the field using approximate 1 inch to 400-foot scale aerials (aerial dated January 31, 2009), which were later transferred to a digital file using Google Earth and then converted to GIS shapefiles. After the initial 2011 Since the field visit, one polygon was added to the study area in the northeast portion. For this polygon, a Google Earth aerial (dated January 31, 2009) was used with reference to the vegetation mapping completed in the field to aerially interpret the vegetation. Vegetation mapping for the northern portion of the BSA was conducted during the 2013 site visit using approximate 1 inch to 400 foot scale aerials (July 19, 2011). After the 2013 site visit, an additional polygon was added in the southwestern portion of the study area. For this polygon, a Google Earth aerial (dated July 19, 2011) was used with reference to the vegetation mapping completed in the field to aerially interpret the vegetation. Where possible, the vegetation mapping followed the classifications defined in *A Manual of California Vegetation* (Sawyer et al. 2007); however, Holland (1986) was also conferred. A component of aerial

interpretation was required for some of the remote and inaccessible locations of the study area, and was based on colorations and patterns as distinguishing features on the aerial photography.

2.2.2 Jurisdictional Resources

A formal jurisdictional delineation was not conducted for the BSA; however, potential jurisdictional features were noted and mapped during the habitat assessment. In addition, topographical maps and aerial photography were reviewed. All features that were noted during the field visit, visible on aerial photography, and mapped as blue-line features on USGS maps are included as potential jurisdictional resources. However, this should not be considered an exhaustive list because many features may not have been visited in the field, evident on aerial photography, or mapped as a USGS blue-line feature.

2.2.3 Regulatory Constraints

Applicable local, state, and federal laws and regulations, enacted to protect and/or manage biological resources were evaluated for their relevance and potential to constrain the proposed project. The analysis of constraints provided in this report is based on a combination of direct evaluation of the site, current regulatory information, and professional judgment.

The federal and state laws listed below are only some of the laws initially considered during all constraint analyses conducted by ICF. Note that many of the regulations listed below may not be applicable to the project at hand, but the applicability of each was considered to determine potential constraints to the project under consideration. For each law, applicable amendments to the original, resulting regulations empowered therein, and relevant judicial precedent were included.

2.2.3.1 Federal Laws

The federal laws listed below were considered during evaluation of the biological resources on the BSA. Note that this is not an exhaustive list of all federal laws that may be considered.

- Bald and Golden Eagle Protection Act.
- Endangered Species Act of 1973 (including designated critical habitat for listed species).
- Federal Noxious Weed Act of 1974.
- Federal Water Pollution Control Act (Clean Water Act).
- Fish and Wildlife Act of 1956.
- MBTA.
- National Environmental Policy Act (NEPA) of 1969.

2.2.3.2 State Laws and Regulations

The state laws and regulations listed below were considered during evaluation of the biological resources on the BSA. Note that this is not an exhaustive list of all state laws and regulations that may be considered. Applicable regulations will be discussed in greater detail in the project EIR.

- California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000–21177, State CEQA Guidelines Sections 15000–15387).

- California Fish and Game Code (including codes for the state Endangered Species Act, those similar to the federal MBTA, and those for Lake or Streambed Alteration Agreements).
- California Native Plan Protection Act
- The California Desert Native Plants Act (Division 23 of the California Food and Agriculture Code)

2.2.3.3 Other Regulations

County of San Bernardino Plant Protection and Management

Chapter 88.01 (Plant Protection and Management) of the San Bernardino County Development Code (San Bernardino County 2007) regulates the removal or harvesting of specified desert native plants and the removal of vegetation within 200 feet of the bank of a stream, or in an area indicated as a protected riparian area on an overlay map or Specific Plan. Removal of specified desert native plants or vegetation within 200 feet of a bank or stream requires a Tree or Plant Removal Permit in compliance with Section 88.01.050 (Tree or Plant Removal Permits) and is subject to environmental review.

The following desert native plants, including parts but excepting fruit, will not be removed except under a Tree or Plant Removal Permit in compliance with Section 88.01.050.

- The following desert native plants with stems 2 inches or greater in diameter or 6 feet or greater in height: Smoke tree (*Psorothamnus spinosa* synonym *Dalea spinosa*) and all species of the genus *Prosopis* (mesquites).
- All species of the family Agavaceae (century plants, nolinas, yuccas).
- Creosote rings, 10 feet or greater in diameter.
- All Joshua trees (*Yucca brevifolia*).
- Any part of the following species, whether living or dead: desert ironwood (*Olneya tesota*), all species of the genera *Prosopis* (mesquites) and *Cercidium* (palos verdes).

The West Mojave Plan

The West Mojave Plan is a federal land use plan that outlines the strategy to conserve and protect more than 100 sensitive plant and animal species, as well as provide guidance for compliance with requirements of the California Endangered Species Act (CESA) and ESA, respectively (Bureau of Land Management 2005).

The West Mojave Plan lists certain requirements for implementing projects within habitat conservation areas. Per the record of decision (Bureau of Land Management 2006), the Plan only applies to federal land and does not apply to private land.

The Western Mojave Plan includes, but is not limited to, the following species for conservation:

- Desert tortoise (*Gopherus agassizii*).
- Mohave ground squirrel (*Xerospermophilus mohavensis*).
- Burrowing owl (*Athene cunicularia*).
- Mojave fringed-toed lizard (*Uma scoparia*).

- Desert cymopterus (*Cymopterus deserticola*).
- Mojave monkeyflower (*Mimulus mohavensis*).

The BSA partially overlaps habitat conservation areas designated for desert tortoise and Mohave ground squirrel in the West Mojave Plan. Within the BSA, the desert tortoise and Mohave ground squirrel conservation areas overlap each other completely, and are also called out as the Superior-Cronese Desert Wildlife Management Area (DWMA) to keep consistent with previous terminology.

The Recovery Plan for the Mojave Population of the Desert Tortoise

The Recovery Plan for desert tortoise (U.S. Fish and Wildlife Service 2011a) identifies six recovery units, in which one to four DWMAs were designated, and describes the development and implementation of specific recovery actions focused within the DWMAs. Maintaining high survivorship of adult desert tortoises was identified as the key factor in recovery (U.S. Fish and Wildlife Service 2011a). The BSA occurs within a portion the Superior-Cronese DWMA.

Chapter 3
Existing Conditions

3.1 Environmental Setting

The BSA is located within and adjacent to the unincorporated community of Hinkley with a small area extending into the city limits of Barstow. The BSA is situated in Hinkley Valley east and southeast of Lynx Cat Mountain, west and southwest of Mount General, and south of Black and Opal Mountains and in the eastern part of Harper Valley north of Red Hill. The BSA occurs within BLM-managed lands as well as privately owned lands (including lands owned by PG&E). Topographically, the BSA is relatively flat and contains one high point in the north named Red Hill on the *Hinkley* 7.5-minute USGS topographic map (U.S. Geological Survey 1971b). Elevations within the BSA range from approximately 2,000 ~~2,100~~ to 2,300 feet above mean sea level (AMSL). In general, the majority of the BSA slopes towards Harper Dry Lake. In addition, t~~T~~he Mojave River flows through the southern portion of the BSA.

The BSA is vegetated with a mosaic of desert scrub communities mixed with agricultural areas, developed residential areas, and small private property holdings (Figure 4). Notable on the BSA are the series of drainage features and corresponding broad fans created from flows draining south and west from Mount General and the Mud Hills, then flowing ~~northwest~~ to Harper Dry Lake. Land use located northeast, north, and west of the BSA are largely undeveloped open space. The West Mohave Desert Ecological Reserve, owned and managed by the California Department of Fish and Game, occurs north of the BSA.

3.2 Vegetation Communities/Land Use

Thirteen distinct vegetation communities and land uses were mapped within the BSA (Figure 4 and Table 2~~1~~). A detailed description for each vegetation community/land use is provided below.

Table ~~1~~2. Plant Communities

Community	Acres
Allscale Scrub	15,370 ~~10,143~~
Allscale Scrub—Sparse Playa	3,342 ~~1,736~~
Allscale Scrub—Disturbed	592 ~~428~~
Fourwing Saltbush Scrub	2
Creosote Bush Scrub	5,589 ~~2,306~~
California Joint Fir Scrub	263
Desert ~~Mojave River~~ Wash	1,049 ~~702~~
Desert Dunes	865 ~~721~~
Tamarisk Thickets	22
Red Brome or Mediterranean Grass Grassland Semi-Natural Herbaceous Stands	25
Ruderal/Disturbed/Barren	2,378 ~~157~~
Agriculture	1,335 ~~263~~
Developed	1,325 ~~264~~

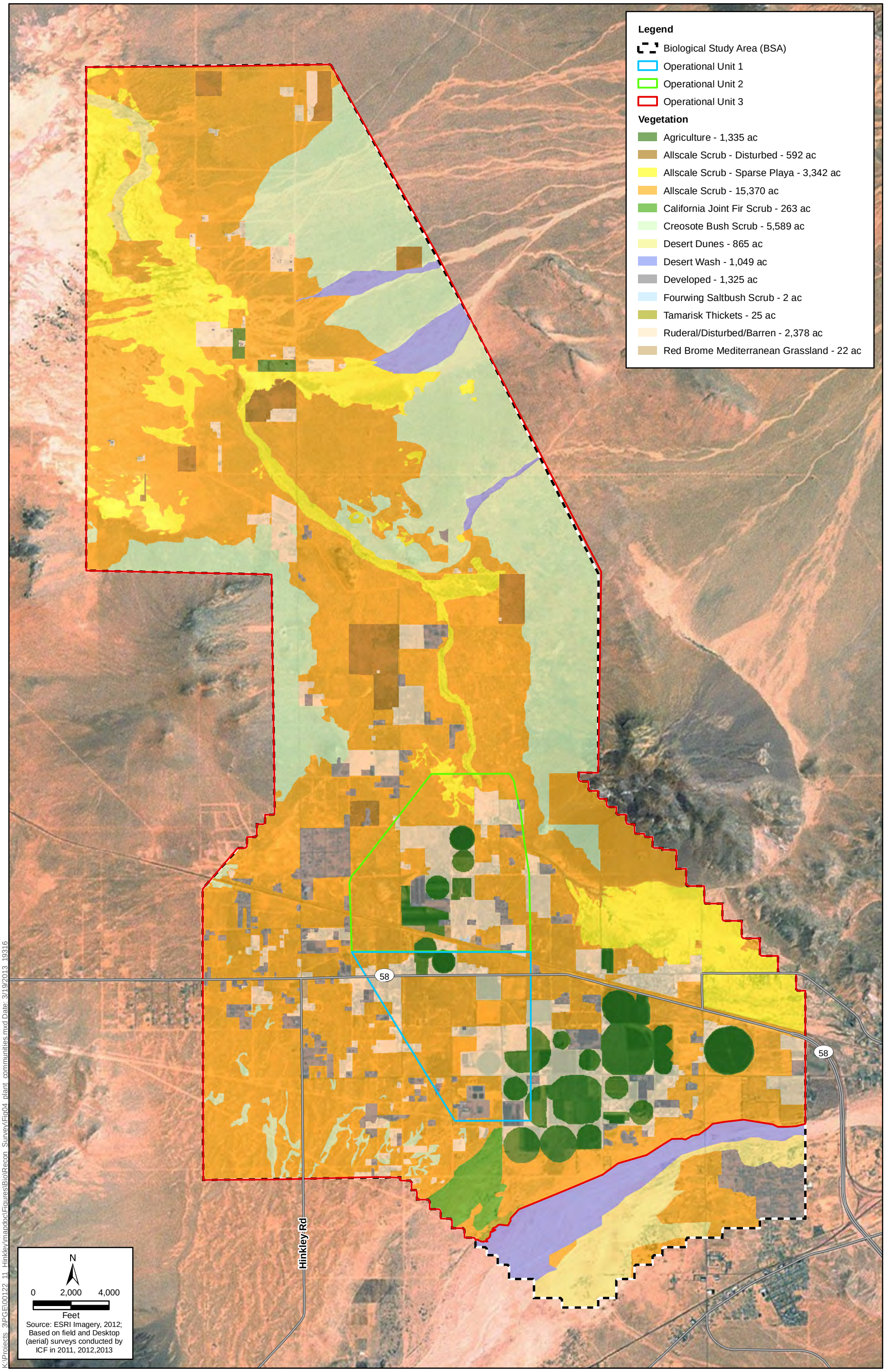

Figure 4
Vegetation Communities
Biological Resources Report
Hinkley Groundwater Remediation Project

Community	Acres
Total	**32,157[1]~~21,032~~**
[1]The BSA acreage is 32,159. Acreage numbers shown are rounded to the nearest whole number.	

3.2.1 Allscale Scrub (*Atriplex polycarpa* Shrubland Alliance)

This vegetation community consists of approximately 15,370 ~~10,143~~ acres and is located throughout the BSA (Figure 4). Habitats within the BSA include small washes, dissected alluvial fans, rolling hills, terraces, and edges of large, low-gradient washes, and playas. In addition, some areas of Allscale Scrub located in the northwestern portion of the BSA contain low sandy dunes. Soils are carbonate rich, alkaline, sandy, or sandy clay loams. This vegetation community is characterized with allscale (*Atriplex polycarpa*) as the dominant in the shrub canopy. Other shrubs include creosote bush (*Larrea tridentata*), white bur-sage (*Ambrosia dumosa*), four-wing saltbush (*Atriplex canescens*), burrobush (*Ambrosia salsola*), spiny hopsage (*Grayia spinosa*), sticky snakeweed (*Gutierrezia microcephala*), and peach desert thorn (*Lycium cooperi*). Canopy of the shrub layer is open to continuous. The herbaceous layer is variable with seasonal annuals and nonnative grasses such as Eriastrum (*Eriastrum* sp.), red-stemmed filaree (*Erodium cicutarium*), red brome (*Bromus madritensis* ssp. *rubens*), cheat grass (*Bromus tectorum*), and common Mediterranean grass (*Schismus barbatus*).

3.2.2 Allscale Scrub—Sparse Playa

This vegetation community consists of approximately 3,342~~1,736~~ acres and is located in the northwestern and southeastern~~ern and eastern~~ portions of the BSA. This community is ~~-~~associated with several ~~an~~ unnamed washes that convey~~s~~ flows in a western and northwestern direction through the BSA to Harper Dry Lake (Figure 4). In addition, some areas of Allscale Scrub—Sparse Playa located in the northwestern portion of the BSA contain low sandy dunes. This community generally comprises the same species composition as the allscale scrub vegetation community; however, the density of shrub and herb cover is notably less. In addition, this community contains areas of washes and playa lakebeds and shores that contain fine silty, cracked, alkaline soils supporting only a few scattered shrubs (e.g., allscale) and herbs (e.g., red-stemmed filaree, cheat grass, and common Mediterranean grass). Mojave spineflower (*Chorizanthe spinosa*; CNPS CRPR 4.2) was observed within several of the northern playa features within this habitat.

3.2.3 Allscale Scrub—Disturbed

This vegetation community consists of approximately 592~~428~~ acres and is located in the central and northern portions of the BSA in association with developed lands (Figure 4). It appears that these~~is~~ areas have~~s~~ been cleared to various degrees and that the allscale scrub is starting to re-vegetate. This community generally comprises the same species composition as the allscale scrub vegetation community; however, the density of shrub and herb cover is notably less due to anthropogenic impacts.

3.2.4 Fourwing Saltbush Scrub (*Atriplex canescens* Shrubland Alliance)

This vegetation community consists of approximately 2 acres and is located in the in the central portion of the BSA immediately north of Santa Fe Ave (Figure 4). Habitats within the BSA include playas, dissected alluvial fans, and rolling hills. Soils are carbonate rich, alkaline, sandy, or sandy clay loams. This vegetation community is characterized by fourwing saltbush as the dominant or co-dominant in the shrub canopy with creosote bush, white bur-sage, or allscale. Other shrubs include burrobush, spiny hopsage, sticky snakeweed, winterfat (*Krascheninnikovia lanata*), peach desert thorn, and bush seepweed (*Suaeda moquinii*). Canopy of the shrub layer is open or intermittent. The herbaceous layer is variable with seasonal herbs and nonnative grasses such as galleta grass (*Pleuraphis rigida*), Indian ricegrass (*Stipa hymenoides*), red brome, cheat grass, and common Mediterranean grass.

3.2.5 Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance)

This vegetation community consists of approximately 5,589 ~~2,306~~ acres and is located predominately in the northeastern and western portions of the BSA; however, areas of Creosote Bush Scrub occur in the central and ~~in the northern and~~ extreme southwestern portions of the BSA (Figure 4). Habitats within the BSA include alluvial fans, bajadas, upland slopes, and minor intermittent washes. Soils are well drained. This vegetation community is characterized by the presence of creosote bush as the dominant or co-dominant in the shrub canopy with fourwing saltbush, white bur-sage, or allscale. Other shrubs include burrobush, spiny hopsage, sticky snakeweed, California joint fir (*Ephedra californica*), and peach desert thorn. Canopy of the shrub layer is intermittent to open. The herbaceous layer is variable with seasonal annuals or perennial grasses such as galleta grass, Indian ricegrass, red brome, cheat grass, and common Mediterranean grass.

3.2.6 California Joint Fir Scrub (*Ephedra californica* Shrubland Alliance)

This vegetation community consists of approximately 263 acres and is located in the southern portion of the BSA (Figure 4). Habitats within the BSA include intermittently flooded arroyos, washes, and adjacent alluvial fans. Soils are coarse to medium sands, loamy sands, and sandy clay loams. This vegetation community is characterized with California joint fir as the dominant or co-dominant in the shrub canopy with four-wing saltbush, white bur-sage, or allscale. Canopy of the shrub layer is open to intermittent. The herbaceous layer is variable with seasonal annuals or perennial grasses such as galleta grass, Indian ricegrass, red brome, cheat grass, and common Mediterranean grass.

3.2.7 Desert ~~Mojave River~~ Wash

This ~~vegetation~~ community consists of approximately 1,049 ~~702~~ acres and occurs in ~~is located along~~ the southern portion of the BSA, ~~end of the study site~~ associated with the Mojave River and in the northeastern portion of the BSA (Figure 4). The Mojave River and other desert washes in the BSA

are ~~is~~ subject to annual rainfall events that can cause heavy flooding and scouring, thereby keeping the channels largely clear of vegetation.

3.2.8 Desert Dunes

This vegetation community consists of approximately 865 ~~721~~ acres and is located adjacent and south of the Mojave River and in the northwestern portion of the BSA where aeolian sands have accumulated. These are wind-blown sand formations that range from sparsely to heavily vegetated ~~to moderately vegetated~~. The aerial photography analysis revealed that this wind-blown sand community can be highly variable on the amount of vegetation that is supported from year to year (based on major flood and wind events), and ranged in vegetation cover from low to ~~moderate~~ high during the field assessment. The areas mapped in the northwestern portion of the BSA are considered the minimum amount of desert dune habitat that is present. Due to various stages of stabilization and their occurrence in fairly small patches, the desert dune plant community can be difficult to map in the field. Therefore, the soils mapped as dune land (Figure 5) may also support this desert dune plant community and should be considered when evaluating this plant community further.

3.2.9 Tamarisk Thickets (*Tamarix* ssp. Semi-Natural Shrubland Stands)

This vegetation community consists of approximately 22 acres and is located within the Mojave River in the BSA. This vegetation community is characterized by saltcedar (*Tamarix ramosissima*) as the dominant shrub. Canopy of the shrub layer is open and the herbaceous layer is sparse.

3.2.10 Red Brome or Mediterranean Grass Grassland Semi-Natural Herbaceous Stands

This vegetation community consists of approximately 25 acres and is located in the central portion of the BSA north of Santa Fe Ave. This vegetation community is characterized by red brome, common Mediterranean grass, or Arabian schismus (*Schismus arabicus*) as dominant or co-dominant with other nonnatives in the herbaceous layer. Within the BSA, these areas are typically on or adjacent to developed areas and/or anthropogenic disturbances including grazing and off-road vehicles.

3.2.11 Ruderal/Disturbed/Barren

This vegetation community consists of approximately 2,378 ~~2,157~~ acres and is located throughout the BSA. This vegetation community is characterized by mostly bare disturbed soils dominated by low growing ruderal (weedy) vegetation and few native species. This vegetation community is associated with anthropogenic disturbances, including agricultural practices, residential clearing and grubbing, refuse dumping, dirt roads, and powerline easements.

3.2.12 Agriculture

This vegetation type/land use consists of approximately 1,335 ~~1,263~~ acres and is located in the central and southern portions of the BSA. This vegetation community is characterized by active or

recently active agricultural fields and orchards. In addition, this classification includes the agricultural treatment units, such as alfalfa, that have been established to remove chromium.

3.2.13 Developed

This vegetation type/land use consists of approximately 1,325 ~~1,264~~ acres and is located throughout the BSA. Areas mapped as developed consist of hardscape features that have been physically altered and commonly observed in association with the various properties within the BSA (i.e., houses, barns and stock ponds) as well as ornamental planting associated with such features.

3.3 Sensitive Natural Community

The California joint fir scrub and desert dunes plant communities are located in the BSA and listed by CDFG as a high priority for inventory, which typically means they are rare. ~~The Mojave River wash may also be considered a sensitive natural community.~~ No riparian habitat within the BSA was observed during the field evaluation.

3.4 Soils

Twenty one ~~Nineteen~~ different soils series encompassing 28 distinct soil types (USDA/NRCS 2013~~1~~) were mapped as being present in the BSA: Arizo, Bryman, Cajon, Cave Loam, Dune Land, Halloran, Helendale, Joshua, Kimberlina, Lovelace, Mohave, Nebona, Norob, Playas, Riverwash, Rock Outcrop, Rosamond, Sparkhule-Rock Outcrop Complex, Victorville, Villa, and Water. Additionally, the very extreme northern portion of the BSA contains an area where soil mapping is not complete. Figure 5 depicts the mapped location of each soil series and type for the site.

3.5 Critical Habitat

Based on a review of USFWS Critical Habitat documentation and maps, critical habitat for the desert tortoise (*Gopherus agassizii*) is mapped within a small portion of the BSA located on the eastern boundary just south of Mount General, as well as the extreme northern portion of the BSA (Figure 6) (U.S. Fish and Wildlife Service ~~2011b~~ 2013).

3.6 Plants and Wildlife

During the ~~December 20, 2011~~ site visits, a variety of plant species and wildlife were observed. Plants observed within and adjacent to the BSA were relatively common to the region. One CNPS-designated CRPR 4.2 ~~special-status~~ plant was observed during the site visits, Mojave spineflower (*Chorizanthe spinosa*)~~, is designated by the CNPS as a CRPR 4.2 species~~. For the purposes of this report, the CNPS 4.2 does not qualify as a special-status plant resource. As such, this plant is not discussed further in this report; however, Figure 7 depicts locations of observed Mojave spineflower. Nine ~~This plant and additional~~ special-status plants were identified through the literature search and determined to have the potential to occur within the BSA. These nine species

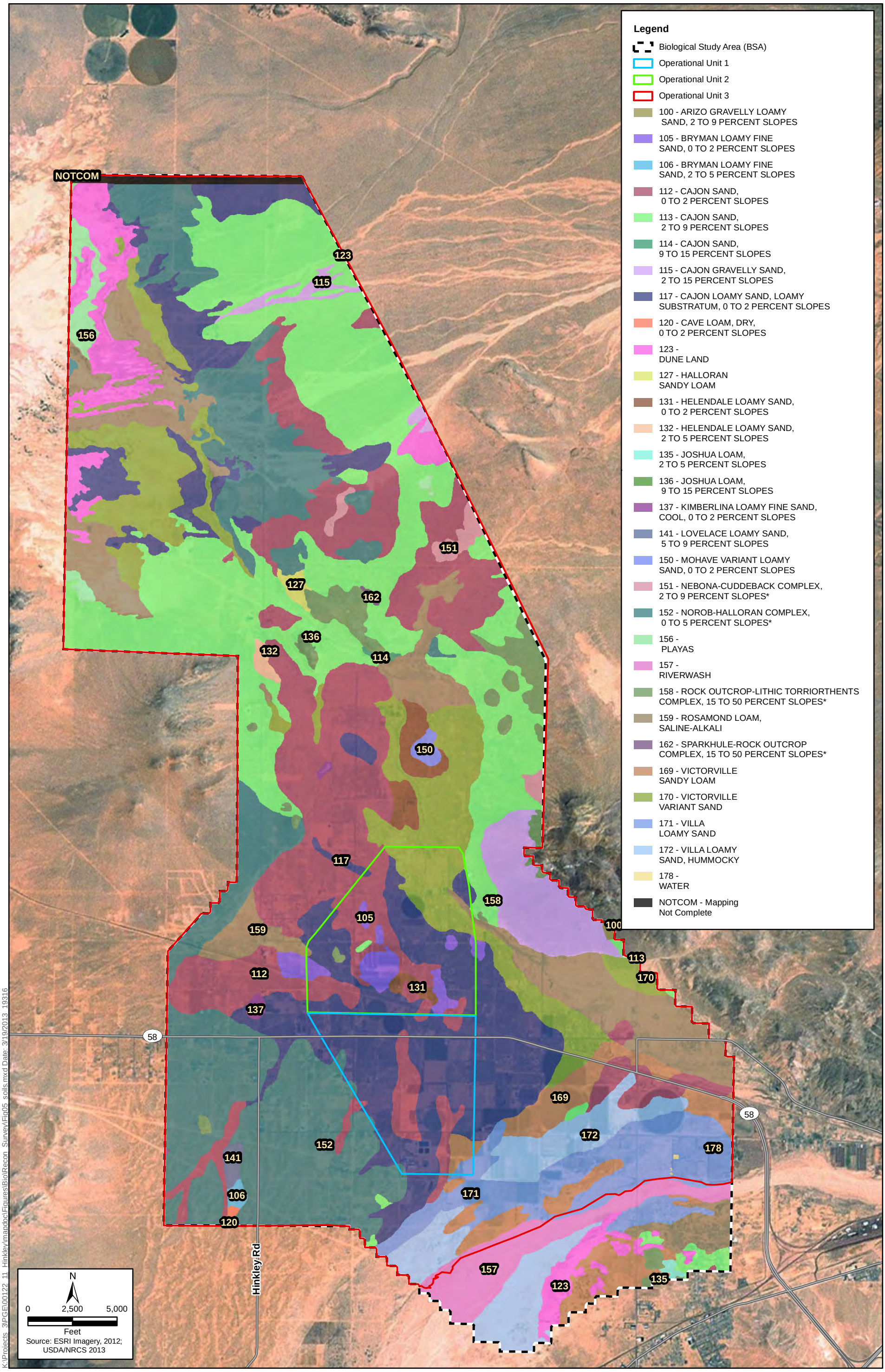

Figure 5
Soils Map
Biological Resources Report
Hinkley Groundwater Remediation Project

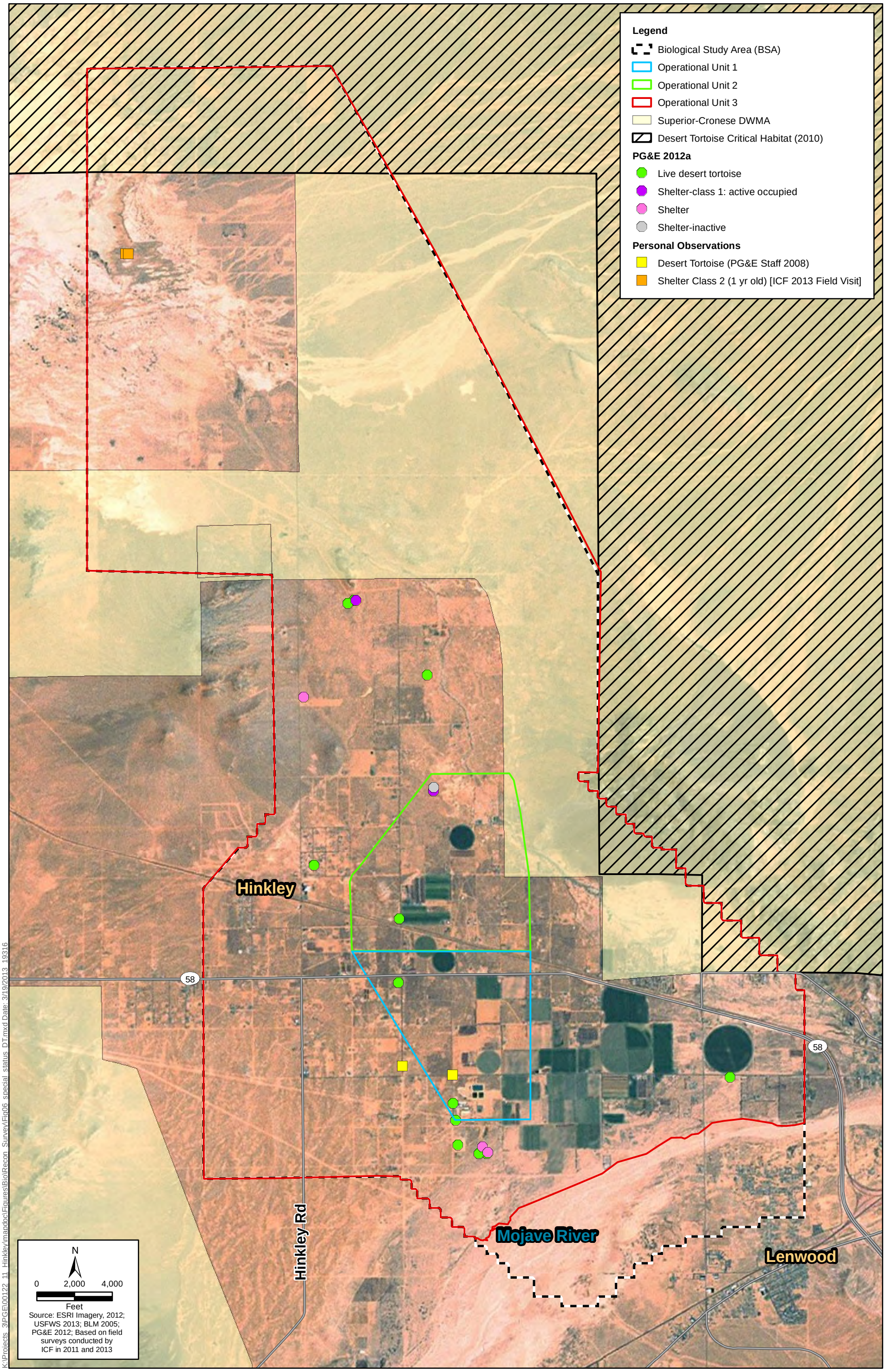

Figure 6
Special-Status Species Map - Desert Tortoise
Biological Resources Report
Hinkley Groundwater Remediation Project

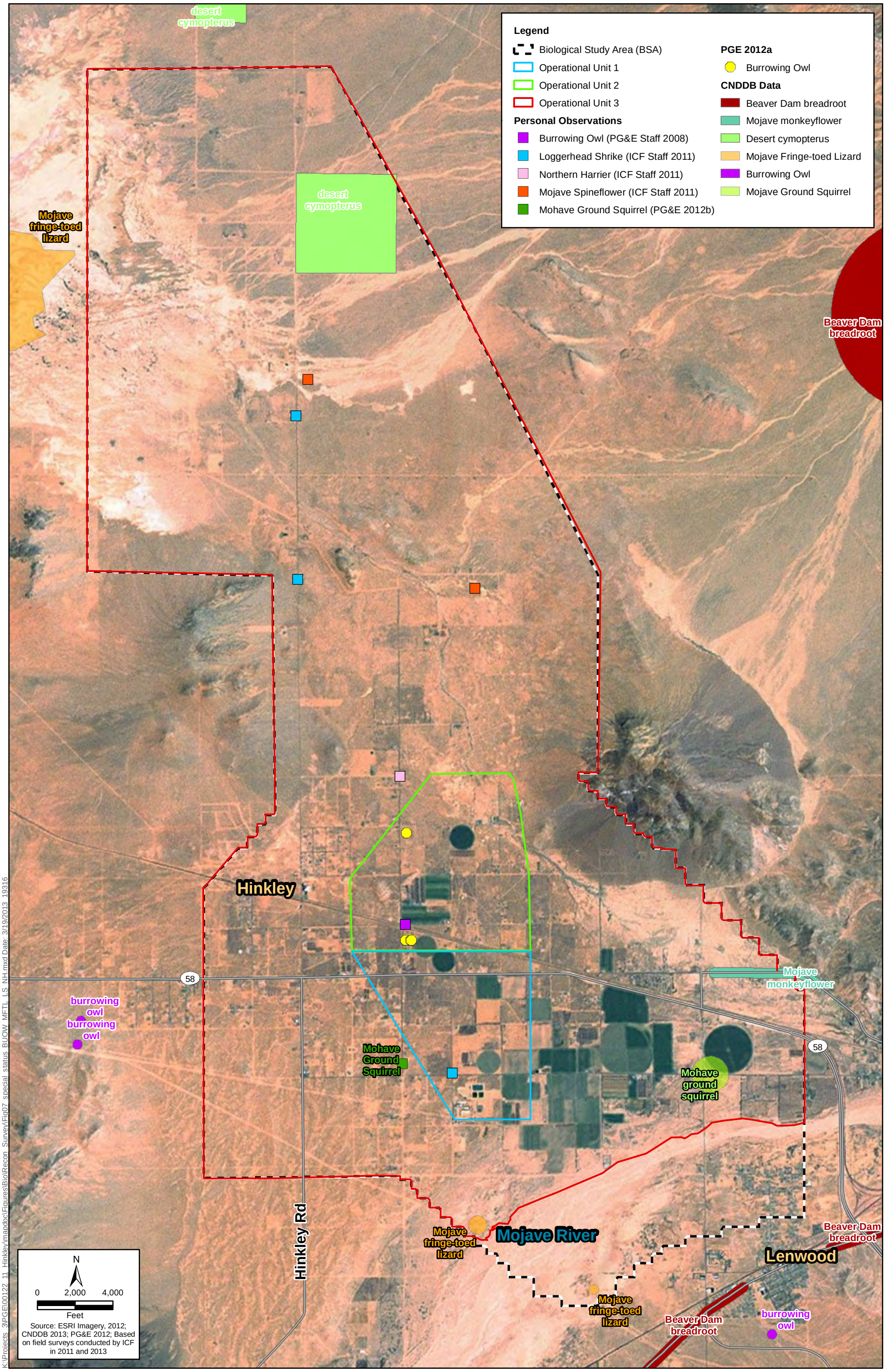

Figure 7
Special-Status Species Map
Biological Resources Report
Hinkley Groundwater Remediation Project

are discussed below. Attachment B lists all the plant species observed within the BSA during the site visit.

Twenty four vertebrate species consisting of 21 birds and three mammals were observed or detected during the field visit. All of the observed species are relatively common to the area during the winter months. Of the 21 birds species observed, northern harrier (*Circus cyaneus*) and loggerhead shrike (*Lanius ludovicianus*) are considered by CDFG to be special status when nesting. These two species, as well as additional special-status wildlife identified through the literature search and determined to have the potential to occur within the BSA, are discussed below. Attachment C lists all the wildlife species observed during the site visit.

3.6.1 Threatened and Endangered Species

3.6.1.1 Plants

Attachment D lists the special-status plant species reviewed and their likelihood of occurrence in the BSA. The determinations were based on a combination of factors, including the species' requirements for some combination of soils, hydrology, habitats, elevation range, and/or disturbance tolerance, along with consideration of the BSA conditions and observed resources. Lane Mountain milkvetch (*Astragalus jaegerianus*), a species that is federally designated as threatened, is identified in the literature review and habitat assessment as having some potential to occur in the BSA. This species is discussed below.

Lane Mountain Milkvetch

Lane Mountain milkvetch is a perennial herb in the pea family (Fabaceae) designated as federally endangered and a CRPR 1B.1 species (California Department of Fish and Game 201~~3~~1b, California Native Plant Society 201~~3~~1). This plant occurs within Joshua tree woodland and Mojavean desert scrub in association with shallow sandy soils with exposed bedrock from 2,952–3,936 feet elevation. Additionally, this plant is known to bloom from April through June (California Native Plant Society 201~~3~~1).

Lane Mountain milkvetch is known to occur at three distinct locations north of Barstow on the slopes of Lane Mountain and within Paradise Valley (California Department of Fish and Game 201~~3~~1a, Consortium of California Herbaria 201~~3~~2). The BSA provides potentially suitable desert scrub; however, the BSA is below the known elevation range of the species. Due to the close proximity of the historical records and given the relatively large amount of desert scrub on the site, it was determined that Lane Mountain milkvetch has a low to moderate potential to occur within the allscale and creosote scrub habitats ~~within~~ of the BSA, particularly on the eastern side of the BSA in association with lower Coon Canyon and the western slopes of Mount General.

3.6.1.2 Wildlife

Attachment D lists the special-status wildlife species and their likelihood of occurrence within the BSA, and Figures 6 and 7 depict special-status wildlife species occurrences in the BSA. These determinations are based on a combination of factors, including the species' requirements for some combination of soils, hydrology, habitats, elevation range, and/or disturbance tolerance, along with consideration of the BSA condition and observed resources. Of the six federally and/or state-listed threatened and endangered wildlife species reviewed to have some potential to occur within the

geographical vicinity of the BSA (California Department of Fish and Game 2013~~1~~a), two, desert tortoise and Mohave ground squirrel, were determined to have some potential to occur based on observed sign or observed conditions during the field evaluation.

Desert Tortoise

The Mojave population of desert tortoise (*Gopherus agassizii*) was listed by USFWS as threatened on April 2, 1990 (U.S. Fish and Wildlife Service 1990). Throughout most of the Mojave Desert, tortoises occur most commonly on gently sloping terrain with sandy-gravel soils and where there is sparse cover of low-growing shrubs, which allows establishment of herbaceous plants. Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. Typical habitat for the desert tortoise in the Mojave Desert has been characterized as creosote bush scrub below 5,500 feet, where precipitation ranges from 2 to 8 inches, the diversity of perennial plants is relatively high, and production of ephemerals is high (U.S. Fish and Wildlife Service 2011a).

Plant species play a major role in defining desert tortoise habitat. Creosote bush, white bur-sage, Mojave yucca (*Yucca schidigera*), and blackbrush (*Coleogyne ramosissima*) generally distinguish desert tortoise habitat. At higher elevations, Joshua tree (*Yucca brevifolia*) and galleta grass (*Pleuraphis rigida*) are common plant indicators (U.S. Fish and Wildlife Service 2011a).

The desert tortoise's most active periods are April through May and September through October (U.S. Fish and Wildlife Service 2010a). Tortoises dig deep burrows (usually located under shrubs on bajadas) for winter hibernation and summer estivation due to generally warm summers and cold winters (U.S. Fish and Wildlife Service 2011a). Diet composition varies throughout the tortoise's range. If winter rainfall is sufficient to germinate annuals, these are consumed, as are herbs, grasses, some shrubs, and the new growth of cacti and cacti flowers. Desert tortoises are preyed upon by several native species of mammals, reptiles, and birds; the best-documented predator of small tortoises is the common raven (*Corvus corax*).

The size of desert tortoise home ranges varies according to location and year (Berry 1986). Females have long-term home ranges that can be as little as or less than half that of that of the average male, which can range to 200 acres (Berry 1986, Duda et al. 1999, Harless et al. 2009). Use of core areas within the lifetime home range of desert tortoises depends on the number of burrows used within those areas (Harless et al. 2009). Over its lifetime, a desert tortoise can use more than 1.5 square miles of habitat and might make periodic forays of more than 7 miles at a time (Berry 1986). Historically, desert tortoise gene flow and movement occurred in a diffuse pattern across the landscape unless otherwise constrained to more narrow, concentrated pathways created by topographic barriers (Hagerty and Tracy 2010, Hagerty et al. 2010).

The BSA partially overlaps portions of the Superior-Cronese DWMA, which is designated by BLM as an Areas of Critical Environmental Concern (ACEC) (Figure 6), and is located within the western recovery unit for desert tortoise (U.S. Fish and Wildlife Service 2011a). Additionally, USFWS critical habitat for the desert tortoise (*Gopherus agassizii*) is mapped within a small portion of the BSA located on the eastern boundary just south of Mount General, as well as the extreme northern portion of the BSA (Figure 6) (U.S. Fish and Wildlife Service ~~2011b~~ 2013).

The CNDDB data reports that desert tortoise is thought to occupy the majority of the northern portion of the BSA and exist within the ~~extreme~~ southwestern portion of the BSA (Figure 6). The CNDDB data also contains two locations for desert tortoise sightings: one occurring just east of the

BSA on the western slopes of Mount General, the second occurring west of the BSA on the east side of Indian Wells Road just north of State Road (SR) 58.

During the January 14, 2013, site visit, a small complex of desert tortoise burrows and one old desert tortoise scat was observed in the northern portion of the BSA (Figure 6). In addition, r~~R~~aw desert tortoise data collected for PG&E was provided ~~by Haley & Aldrich on February 15, 2012, based on biological surveys implemented by PG&E in~~for the study area (Pacific Gas and Electric 2012a and Knutson pers. comm.). It is noted that some of the desert tortoise depicted could be domesticated individuals (not wild). Figure 6 shows these desert tortoise sightings. The majority of these observations occurred in the allscale scrub plant community, with some individuals observed in California joint fir scrub, as well as disturbed and developed areas.

Based on the habitat conditions within the BSA and the previously mentioned desert tortoise occurrence locations, the desert tortoise was determined to have low to high potential to occur throughout the undeveloped portions of the BSA, with some areas being considered as occupied where sign and desert tortoises have been observed. Figure 8 shows a broad overview of the suitability of the habitat based on the following breakdown of mapped plant communities: moderate-quality to high-quality suitable habitat includes allscale scrub, allscale scrub—sparse playa, allscale scrub—disturbed, fourwing saltbush scrub, creosote bush scrub, ~~and~~ California joint fir scrub, and the desert dunes located in the northern portion of the BSA; low-quality suitable habitat includes, desert ~~Mojave River~~ wash, the desert dunes in the southern portion of the BSA associated with the Mojave River, tamarisk thickets, red brome or Mediterranean grass grassland, semi-natural herbaceous stands, and ruderal/disturbed/barren; unsuitable desert tortoise habitat includes developed and agriculture.

Vegetation communities considered to have a low potential lack the quantity and quality of characteristics typically associated with occupied habitats. For example, desert tortoises require a burrowing substrate; however, communities such as desert ~~Mojave River W~~washes and the southern d~~D~~esert d~~D~~unes associated with the Mojave River are dynamic and may lack stabilized soils suitable for burrowing. Although these conditions might preclude occupation of a burrow, foraging and movement may occur. In addition, desert washes that are infrequently inundated could support desert tortoise burrows. Other vegetation communities within the BSA~~study area~~, such as tamarisk thickets, red brome or Mediterranean grass grasslands, semi-natural herbaceous stands, and ruderal/disturbed/barren, are of such poor quality in terms of foraging material, soils, and magnitude of disturbances that occupation might be precluded or occur at a low level. However, if these low-quality habitats are located adjacent to and interspersed with moderate- to high-potential vegetation communities, the likelihood of occurrence is increased.

Mohave Ground Squirrel

Mohave ground squirrel was listed as threatened under CESA in 1993. There is currently no federal listing for this species. The Mohave ground squirrel is a generalist in relation to plant community preference; it has been found in the exact proportion as the distribution of plant communities within its range (Bureau of Land Management 2005). The plant communities with the highest percentage of occurrence and therefore the highest percentage of Mohave ground squirrel occurrence are Mojave creosote brush scrub, desert saltbush scrub, and Mojave mixed woody scrub (Bureau of Land Management 2005). The Mohave ground squirrel is absent from steep, very rocky areas and playas (i.e., a sandy, salty, or mud-caked flat floor of a desert drainage basin that is periodically covered with water). Soil characteristics are important because Mohave ground squirrels construct burrows

to shelter from temperature and humidity extremes, to escape predators, and to give birth (U.S. Fish and Wildlife Service 2010b).

Mohave ground squirrels are only active and above ground generally February through July (adults) or August (juveniles) and spend the remainder of year underground in a state of dormancy (U.S. Fish and Wildlife Service 2010b). The length of the active season and Mohave ground squirrel movement can also be affected by rainfall amounts, such that the number of individuals in an area appears to decline during dry years, and movements and home range size shrink (Harris and Leitner 2004). In dry years where no reproduction has occurred, adults may enter dormancy as early as the end of April. Burrows are used for aestivation and hibernation, predator avoidance, and thermoregulation. Chenopods, particularly winterfat and spiny hopsage, are common components of Mohave ground squirrel diet in its northern range (Leitner 1996 as cited in Bureau of Land Management 2005); however, it is hypothesized that these plant species are equally important in the southern portion of its range (Bureau of Land Management 2005).

Trapping success rates correspond to high incidences of winterfat and hopsage, and support the hypothesis that chenopods may be important to Mohave ground squirrel foraging ecology (Bureau of Land Management 2005). These plant species were observed with the BSA. Generally, leaves, flowers, fruits, and seeds from a variety of plants, arthropods (caterpillars), and fungi comprise Mohave ground squirrel diet (Best 1995, U.S. Fish and Wildlife Service 2010b). When available in spring, nearly all of the diet of Mohave ground squirrel is new, tender, green vegetation (Best 1995). This species is also known to eat alfalfa (Best 1995).

The BSA overlaps the easternmost extent of the current range known range of the Mohave ground squirrel (Bureau of Land Management 2005, Leitner 2008, U.S. Fish and Wildlife Service 2010b). The north and northeastern portions of the BSA overlap the Mohave Ground Squirrel Conservation Area established by the West Mojave Plan (Leitner 2008). There are four recognized important areas for the Mohave ground squirrel with proximity to the BSA (Leitner 2008, U.S. Fish and Wildlife Service 2010b): Coolgardie Mesa–Superior Valley located northeast of the BSA, Edwards Air Force Base located southwest of the BSA, Boron-Kramer Junction located west of the BSA, and Pilot-Knob located north of the BSA. Leitner (2008) suggests that although the elevation is lower and the habitat is of lesser quality, the area extending from the vicinity of Harper~~'s~~ Dry Lake ~~(immediately northwest of the BSA)~~ southwest to Edwards Air Force Base represents a linkage from the Coolgardie Mesa–Superior Valley Core Area and the Edwards Air Force Base Core Area.

Mohave ground squirrel has been recorded within and in the region of the BSA. The CNDDB lists two historic records for this species as occurring within the Barstow, Hinkley and Water Valley USGS quads (California Department of Fish and Game 2013~~1~~a). One record dated from 1982 is from the Barstow area, where one Mohave ground squirrel was detected just northwest of the Fort Irwin Road/SR-58 junction. A second report dated 1990 was recorded as occurring within the BSA at the junction of Lenwood Road and Community Boulevard (Figure 7) where all scale scrub was mapped during this habitat assessment. This record states that an unknown number of individuals were recorded in the area between March 1 and April 30 by Critchlow as reported in a summary document prepared by D. Clark in 1992. Leitner (2008) describes a non-specific location of Mohave ground squirrel detected at the edge of an alfalfa field near Harper Dry Lake.

Raw Mohave ground squirrel data was provided by PG&E~~Arcadis on May 8, 2012~~, based on biological surveys completed by Arcadis~~implemented by PG&E~~ in the study area (Pacific Gas and Electric 2012b). One Mohave ground squirrel was detected on February 23, 2012 within the BSA in

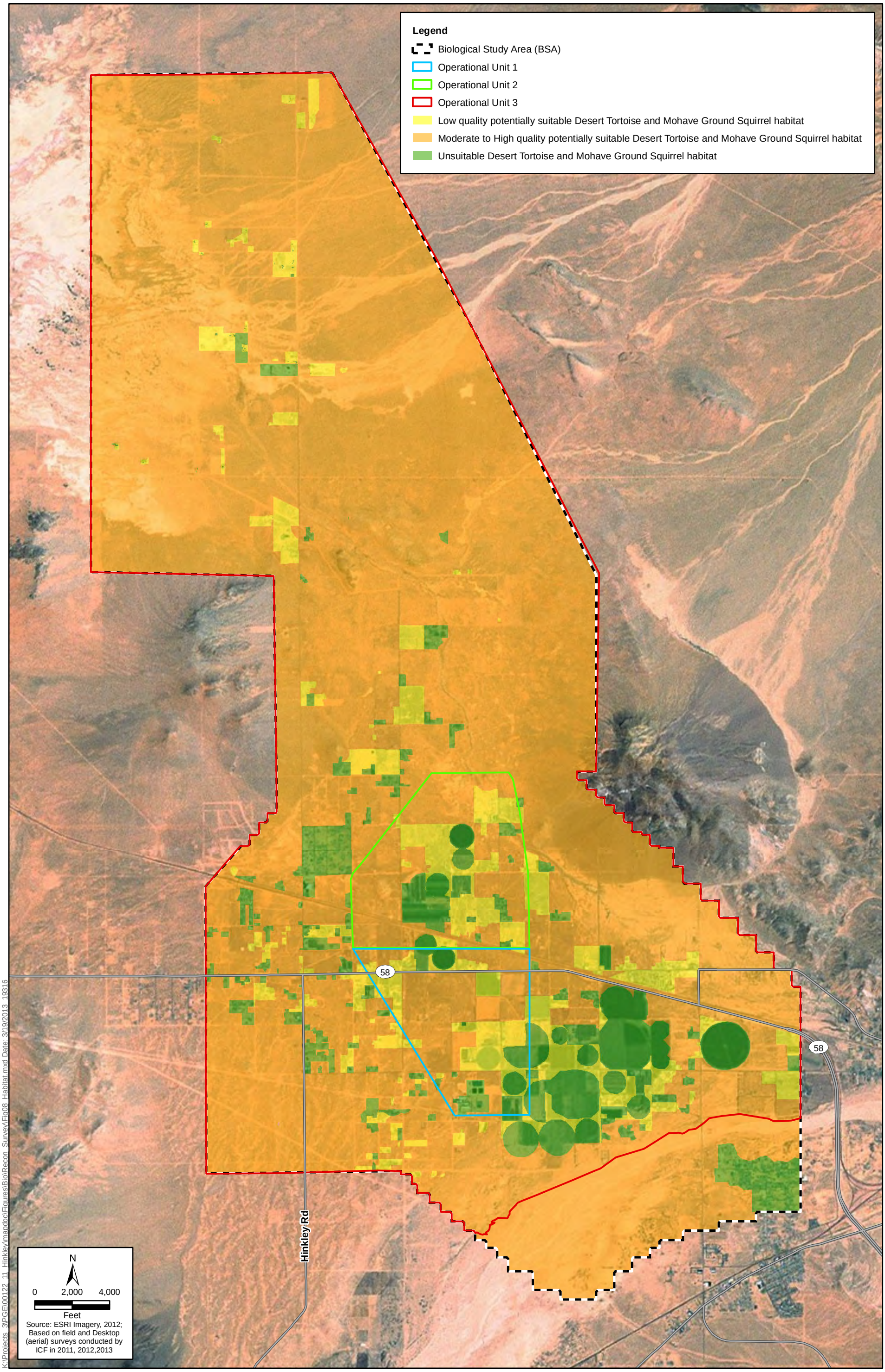

Figure 8
Suitable Desert Tortoise and Mohave Ground Squirrel Habitat
Biological Resources Report
Hinkley Groundwater Remediation Project

and near a burrow along existing barbed wire fencing approximately 25 feet north of Frontier Road (unpaved) (Figure 7). This road is currently used by residents of the area. The plant community around the burrow and unpaved roads consists primarily of allscale scrub. Saltbush is the dominant floral species observed in this area. The Mohave ground squirrel was first observed foraging for food and then in front of the burrow.

Due to the historic records and the presence of suitable habitat and recent detection of one Mohave ground squirrel, it is concluded that Mohave ground squirrel has the potential to occur within the BSA. Figure 8 shows a broad overview of the suitability of the habitat, which at this broad level of mapping mimics desert tortoise habitat suitability, as discussed in the section above.

3.6.2 Non-Listed Special-Status Plants

Twelve non-listed special-status plants were identified in the literature search and habitat assessment as occurring in the vicinity of the BSA (Consortium of California Herbaria 2013, California Department of Fish and Game 2013a, California Native Plant Society 2013). Based on observed conditions during the site visit, eight were determined to have a moderate or higher potential to occur within the BSA: Clokey's cryptantha (*Cryptantha clokeyi*), Desert cymopterus (*Cymopterus deserticola*), Barstow woolly sunflower (*Eriophyllum mohavense*), Mojave menodora (*Menodora spinescens* var. *mohavensis*), Creamy blazing star (*Mentzelia* tridentata), Mojave monkeyflower (*Mimulus mohavensis*), Beaver Dam breadroot (*Pediomelum castoreum*), and Parish's phacelia (*Phacelia parishii*). These species are discussed further below.

Clokey's Cryptantha

Clokey's cryptantha is an annual herb in the borage family (Boraginaceae) designated as a CRPR 1B.2 species (California Department of Fish and Game 2013b, California Native Plant Society 2013). This plant occurs in Mojavean desert scrub from 2,378–4,477 feet elevation. In addition, this species is known to bloom in April (California Native Plant Society 2013).

Several collections of this species were made in the 1930s immediately north of Barstow; however, no new collections have been made in the area since (Consortium of California Herbaria 2013, California Department of Fish and Game 2013a). Additionally, collections of the species were made in 2001 on Fort Irwin (Consortium of California Herbaria 2013, California Department of Fish and Game 2013a). The BSA supports potentially suitable desert scrub. As such, it was determined that this species has low to moderate potential to occur within the BSA, particularly in association with the allscale scrub habitat on the west facing slopes of Mount General.

Desert Cymopterus

Desert cymopterus is a perennial herb in the carrot family (Apiaceae) designated as a CRPR 1B.2 species (California Department of Fish and Game 2013b, California Native Plant Society 2013). This species occurs within Joshua tree woodland and Mojavean desert scrub with sandy soils from 2,066–4,920 feet elevation. In addition, this species is known to bloom from March through May (California Native Plant Society 2013).

Several collections of desert cymopterus have been made within ~~in the vicinity of~~ the BSA. In particular, desert cymopterus was collected throughout the Water Valley quadrangle and on both the east and west side of Hinkley Road in 2000 and 2001~~north of the BSA east of Harper's Dry Lake~~ (Consortium of California Herbaria 2013, California Department of Fish and Game 2013a). The

plant also was observed during the Spring 2013 surveys (Klein 2013). The desert scrub communities are considered to be potentially ~~The BSA supports potentially~~ suitable for this species~~desert scrub~~. As such, given that this species was collected within the project area ~~due to the close proximity of Harper's Dry Lake to the BSA,~~ and the relatively large amount of desert scrub habitat on site, it was determined that this species has moderate to high potential to occur in the allscale and creosote scrub habitats within the BSA.

Barstow Woolly Sunflower

Barstow woolly sunflower is an annual herb in the sunflower family (Asteraceae) designated as a CRPR 1B.2 species (California Department of Fish and Game 2013~~1~~b, California Native Plant Society 2013~~1~~). This species occurs in saltbush scrub, Mojavean desert scrub and within playas from 1,650-3,148 feet elevation. In addition, this species is known to bloom from March through May (California Native Plant Society 2013~~1~~).

Several collections of this species have been made both east and west ~~north~~ of the BSA ~~near Barstow~~ (Consortium of California Herbaria 2013~~2~~, California Department of Fish and Game 2013~~1~~a). The BSA supports potentially suitable allscale scrub, ~~and~~ creosote scrub, and playa habitat for this species. As such, it was determined that this species has moderate to high potential to occur within the allscale and creosote scrub and playa habitats in the BSA.

Mojave Menodora

Mojave menodora is a perennial deciduous shrub in the olive family (Oleaceae) designated as a CRPR 1B.2 species (California Department of Fish and Game 2013~~1~~b, California Native Plant Society 2013~~1~~). This species occurs in Mojavean desert scrub on rocky slopes and within rocky canyons from 2,263–6,560 feet elevation. This species is often found in association with andesite gravel. In addition, this species is known to bloom from April through May (California Native Plant Society 2013~~1~~)

This species has been collected northeast of the BSA at the highpoint of Waterman Hills (Consortium of California Herbaria 2013~~2~~, California Department of Fish and Game 2013~~1~~a). The BSA supports potentially suitable desert scrub habitat. As such, it was determined that this species has low to moderate potential to occur on site within the allscale and creosote scrub habitats, particularly the eastern portion of the BSA associated with the western slopes of Mount General.

Creamy Blazing Star

Creamy blazing star is an annual herb in the loasa family (Loasaceae) designated as a CRPR 1B.3 species (California Department of Fish and Game 2013~~1~~b, California Native Plant Society 2013~~1~~). This species occurs in Mojavean desert scrub in association with gravelly, rocky and/or sandy substrates from 2,296–3,805 feet elevation. In addition, this species is known to bloom from March through May (California Native Plant Society 2013~~1~~).

This plant has been ~~collected~~ recorded as occurring within the BSA just north of the intersection of Hinkley Road and Burnt Tree Road. The occurrence record is from two collections made in 1922. In addition, this plant has been recorded as occurring east of the ~~east of the~~ BSA in the Waterman Hills (Consortium of California Herbaria 2013~~2~~, California Department of Fish and Game 2013~~1~~a). The BSA was found to support~~s~~ potentially suitable desert scrub in association with rocky, gravelly, and sandy substrates. As such, it was determined that this species has a moderate potential to occur

within the BSA in the allscale and creosote scrub habitats, particularly the eastern portion of the BSA associated with the western slopes of Mount General and the area surrounding the intersection of Hinkley and Burnt Tree Roads.

Mojave Monkeyflower

Mojave monkeyflower is an annual herb in the lopseed family (Phrymaceae) designated as a CRPR 1B.2 species (California Department of Fish and Game 2013~~1~~b, California Native Plant Society 2013~~1~~). This species occurs in Joshua tree woodland and Mojavean desert scrub in association with sandy or gravelly substrates from 1,968–3,936 feet elevation and is often associated with washes. In addition, this species is known to bloom in June (California Native Plant Society 2013~~1~~).

This species is known to occur in the BSA from a single 1941 collection. This collection was made just east of the intersection of Lenwood Road and Santa Fe Avenue on the eastern side of the BSA. Several other occurrences are mapped in the vicinity of the BSA (Consortium of California Herbaria 2013~~2~~, California Department of Fish and Game 2013~~1~~a). The BSA supports potentially suitable rocky to sandy desert scrub. As such, it was determined that this species has moderate to high potential to occur on the site in the allscale and creosote scrub as well as in the desert dune and desert ~~Mohave river~~ wash habitats within the BSA.

Beaver Dam Breadroot

Beaver Dam breadroot is a perennial herb in the pea family (Fabaceae) designated as a CRPR 1B.2 species (California Department of Fish and Game 2013~~1~~b, California Native Plant Society 2013~~1~~). This species occurs in Joshua tree woodland and Mojavean desert scrub from 2,000–5,002 feet elevation. This species is often found in association with road cuts and sandy washes. In addition, this species is known to bloom from April through June (California Native Plant Society 2013~~1~~).

Several collections of this species have been made both south and east of the BSA (Consortium of California Herbaria 2013~~2~~, The species was also observed onsite during the spring 2013 surveys (Klein 2013, California Department of Fish and Game 2013~~1~~a). The BSA supports potentially suitable desert scrub. As such, it was determined that this species has moderate potential to occur within the allscale and creosote scrub habitat in the BSA.

Parish's Phacelia

Parish's phacelia is an annual herb in the borage family (Boraginaceae) designated as a CRPR 1B.1 species (California Department of Fish and Game 2013~~1~~b, California Native Plant Society 2013~~1~~). This species occurs within Mojavean desert scrub and within clay or alkaline playas from 1,771–3,936 feet elevation. In addition, this species is known to bloom from April through June (California Native Plant Society 2013~~1~~).

Several collections of this species have been made east and south of the BSA in the vicinity of Barstow (Consortium of California Herbaria 2013~~2~~, California Department of Fish and Game 2013~~1~~a). The BSA contains potentially suitable desert scrub and playa habitat. As such, it was determined that this species has low to moderate potential to occur within the allscale and creosote scrub habitats within the BSA.

3.6.3 Non-Listed Special-Status Wildlife

Attachment D lists the special-status wildlife species and their likelihood of occurrence within the BSA. These determinations are based on a combination of factors including the species' requirements for a combination of soils, hydrology, habitats, elevation range, and/or disturbance tolerance, along with consideration of the BSA condition and observed resources. Six non-listed special-status species are reviewed to have some potential to occur within the geographical vicinity of the BSA (California Department of Fish and Game 2013~~1~~a) (Attachment D). Burrowing owl, loggerhead shrike, northern harrier, American badger (*Taxidea taxus*), Mohave river vole (*Microtus californicus mohavensis*), and Mojave fringe-toed lizard are judged to have moderate or greater potential for occurrence based on current habitat conditions within the BSA and are discussed in more detail below. Special-status species detected within the BSA during field work in December 2011 and 2013 include loggerhead shrike and northern harrier.

Burrowing Owl

Burrowing owl is designated a California species of special concern (SSC) by CDFG and a BLM sensitive species. The burrowing owl requires habitat with three basic attributes: open, well-drained terrain; short, sparse vegetation; and underground burrows or burrow facsimiles. Habitat in California includes open, dry, nearly or quite level grassland, prairie, and desert floor. Burrowing owls have been recorded in grasslands, deserts, sagebrush scrub, agricultural areas (including pastures and untilled margins of cropland), earthen levees and berms, coastal uplands, urban vacant lots, and the margins of airports, golf courses, and roads. Throughout their range, most burrowing owls rely on burrows excavated by ground squirrels, badgers, foxes, desert tortoises, and coyotes. Where the number and availability of natural burrows is limited (for example, where burrows have been destroyed or ground squirrels eradicated), owls will occupy drainage culverts, cavities under piles of rubble, discarded pipe, and other tunnel-like structures. Many researchers and observers have noted a strong association between burrowing owls and burrowing mammals, especially ground squirrels (*Spermophilus* spp.) and kit foxes (*Vulpus macrotis*).

Burrowing owls in California typically begin pair formation and courtship in February or early March, when adult males attempt to attract a mate. Beginning in April, eggs are laid at least 1 day apart and are incubated by both adults for about 3–4 weeks. Young owlets are brooded underground for another 3–4 weeks, at the end of which time they can sometimes be seen at the burrow entrance. Nestlings emerge asynchronously and tentatively in early June. The burrowing owl is active during day and night, but is generally most active near dawn and dusk. During the breeding season, burrowing owls spend most of their time within 160–325 feet of their nest or satellite burrows during daylight hours and forage diurnally in the vicinity of the natal burrow.

Burrowing owls have been recorded in the vicinity of the BSA, with several recorded to the west and south of the BSA in 2007 (California Department of Fish and Game 2013~~1~~a). ~~They have also been observed within the BSA near the intersection of Acacia Street and the Santa Fe Railroad (Knutson pers. comm.) (Figure 7).~~ In addition, raw burrowing owl data collected for PG&E was provided for the study area (Pacific Gas and Electric 2012a and Knutson pers. comm.)~~by Haley & Aldrich on February 15, 2012 based on biological surveys implemented by PG&E in the study area~~. Figure 7 shows these burrowing owl sightings.

The majority of the BSA (outside of developed areas) provides low- to high-quality foraging habitat for this species, and any areas with suitable burrows would provide potential nesting habitat. Alfalfa

fields can provide high-quality foraging habitat for burrowing owl: such fields might be particularly attractive to burrowing owl as foraging areas in the BSA.

Loggerhead Shrike

Loggerhead shrike is designated an SCC[1] by CDFG that breeds mainly in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground. They require tall shrubs or trees (also use fences or power lines) for hunting perches, territorial advertisement, and pair maintenance; open areas of short grasses, forbs, or bare ground for hunting; and large shrubs or trees for nest placement. They also need impaling sites for prey manipulation or storage; such sites can include sharp, thorny, or multi-stemmed plants and barbed-wire fences (Yosef 1996). Nests are generally well hidden in taller shrubs or low in trees, and are often located in areas where there is a break in the landscape, such as at the base of slopes or edge of a woodland or clump of trees (Yosef 1996).

The literature search provided two observation records for loggerhead shrikes located south of Harper Dry Lake approximately six miles east of the BSA (California Department of Fish and Game 2013~~1~~a). During the December 20, 2011 site visit, ICF staff observed loggerhead shrikes in two separate locations in the northern portion of the BSA along Hinkley Road (Figure 7). These individuals were observed perched on the overhead telephone line located on the west side of Hinkley Road and appeared to be foraging to the east within the BSA.

The majority of the BSA (outside of the developed areas) provides high-quality foraging and nesting habitat for loggerhead shrike.

Northern Harrier

Northern harrier is designated an SSC[2] by CDFG. This species is known to breed and forage in a variety of habitats that provide appropriate vegetation cover, abundance of prey and suitable perch sites (Shuford and Gardali 2008). These habitats typically include fresh, brackish, and saltwater marshes; meadows, lake margins, rivers, and streams; grasslands, open fields, pastures, and some croplands such as alfalfa and grain; sagebrush flats, and desert sinks (Shuford and Gardali 2008). The northern harrier is a ground-nesting bird and often nests within areas of dense, tall undisturbed vegetation. The northern harrier preys on a variety of small- to medium-sized vertebrates such as rodents and passerines.

During the December 20, 2011, site visit, a single male northern harrier was observed within the northern portion of the BSA at the intersection of Mountain View Road and Tindall Road (Figure 7). Shuford and Gardali (2008) conclude that while northern harrier is historically known to breed northwest of the BSA at Harper~~'s~~ Dry Lake, no breeding activity has been observed at the lake since the mid-1990s. It is possible that northern harriers might occasionally nest in agricultural areas in the West Mojave (Garrett and Molina undated).

The northern harrier was determined to forage in the BSA and has low potential to occur within the BSA in a breeding capacity. The majority of the BSA provides suitable foraging habitat for the

[1] CDFG designates the loggerhead shrike as a California SSC only when nesting. All other non-nesting occurrences of loggerhead shrike would not be considered sensitive.

[2] CDFG designates the northern harrier as a California SSC only when nesting. All other non-nesting occurrences of northern harrier would not be considered to be sensitive.

northern harrier. Suitable nesting habitat in the BSA is nearly absent due to the lack of dense, tall undisturbed vegetation, although the agricultural areas may provide suitable nesting habitat.

American Badger

American badger is designated an SSC by CDFG that is most abundant in drier open stages of most shrub and herbaceous habitats, with friable soils (Ahlborn 1988–1990). Badgers dig burrows in friable soil for cover and frequently reuse old burrows, although some may dig a new den each night, especially in summer (Messick and Hornocker 1981). Long (1973) and Jager et al. (2006) have shown that badgers are born approximately in late March and early April and leave the natal den in late June and early July.

The literature search provided two observation records for American badger located approximately 2.5 and 3 miles west of the BSA and north of SR 58 (California Department of Fish and Game 2013a).

The majority of the BSA (outside of developed areas) provides moderate quality foraging and denning habitat for this species.

Mohave River Vole

Mojave River vole is designated an SSC by CDFG. This species occurs in habitat that is moist, including meadows, freshwater marshes, and irrigated pastures, in locations in the vicinity of the Mojave River. Suitable habitat is associated with ponds and irrigation canals along with the Mojave River proper, as well as adjacent alfalfa fields (Williams 1986). In the Mojave River, this vole has been recorded in cattail marsh/wetland habitat that is subjected to annual flooding and riparian-associated habitats that provide refuge during annual flooding. They also utilize adjoining upland habitat during unusually high water levels.

The closest recorded location of Mojave River vole is 7 miles to the northwest of the BSA (California Department of Fish and Game 2013~~1~~a). The closest suitable native habitat in the Mojave River (based on aerial photography analysis) appears to be approximately 5 miles to the southwest. Alfalfa fields located 1.6 miles southwest of the Mojave River could provide suitable habitat for this vole.

The observed areas of the Mojave River that occurs in the BSA~~study area~~ provide no suitable moist habitats for the Mohave River vole. However, numerous areas of alfalfa fields and other fallow fields in close proximity to the Mojave River could provide suitable habitat. Within the study area, areas supporting alfalfa and fallow fields are judged to have low to moderate potential to support Mohave River vole.

Mojave Fringe-Toed Lizard

Mojave fringe-toed lizard is designated an SSC and a BLM sensitive species. This lizard is restricted to areas with fine, aeolian sand, including both large and small dunes, margins of dry lakebeds and washes, and isolated pockets against hillsides (Stebbins 1944, 1985; Smith 1946; Norris 1958). These areas are generally within creosote scrub desert between elevations of 300–3,000 feet (Norris 1958; Stebbins 1985). Sand dune ecosystems, including their source sand and sand corridors, are necessary for the long-term survivorship of aeolian sand specialists, such as, fringe-toed lizards (Barrows 1996). Breeding activity occurs between April and July (Mayhew 1964). Females lay 1 to

5 eggs in hummocks or sandy hills during the months of May through July (Stebbins 1985). Hatchlings appear in September (Miller and Stebbins 1964).

Mojave fringe-toed lizards have been recorded at two locations in the southwestern portion of the BSA (Figure 7) in 2010 (California Department of Fish and Game 2013~~1~~a). The vegetation classifications at these locations include California joint fir scrub and desert dunes (Figure 4).

Based on the locations of recent records and the suitability of the habitat, areas within the BSA ~~study area~~ classified as California joint fir scrub, desert dunes, the allscale scrub located in the northwestern portion of the BSA with suitable low sand dunes, and the areas mapped as desert ~~Mojave river~~ wash are considered moderately to highly suitable habitat and are expected to have ~~with~~ some current occupation by this species. In addition, soils mapped as dune land (Figure 5) may also support Mojave fringe-toed lizard.

3.6.3.2 Wildlife Corridors

The BSA supports wildlife movement for small- to medium-sized mammals, birds, and reptiles, including the desert tortoise and Mohave ground squirrel. Wildlife movement is expected to be higher along the natural corridors of the BSA, such as the east-west corridor comprised of the Mohave River and along SR 58 in the southern portion of the BSA. The unnamed wash system that flows northwest ~~through the site~~ to Harper Dry Lake constitutes a natural corridor for wildlife movement. Additionally, the large open areas of scrub habitat provide relatively unrestricted movement across the BSA.

3.6.4 Raptor Foraging

The BSA was evaluated for its potential to support raptor foraging activities. A variety of raptor species were observed during the site visit, including red-tail hawk (*Buteo jamaicensis*), northern harrier, prairie falcon (*Falco mexicanus*) and American kestrel (*Falco sparverius*), and burrowing owls are known to occur within the BSA. The primary agricultural crop grown in the study area is alfalfa, which has been shown to have a positive relationship with raptor species (Smallwood 1995, Pandolfino et al. 2011). Due to the relatively open nature of the desert scrub within the BSA in combination with the patchwork of active agricultural and non-active disturbed fields, the BSA was determined to provide quality foraging opportunities for raptor species in the region.

3.6.5 Nesting Birds

The BSA has abundant nesting opportunities for common bird species throughout the BSA. In addition, special-status species that may nest within the BSA include burrowing owl and loggerhead shrike.

3.6.6 Jurisdictional Resources

The study area contains features that are potentially subject to the jurisdiction of the U.S. Army Corps of Engineers, RWQCB, and CDFG. A review of the topographical maps prepared for the BSA and vicinity show that the majority of the features mapped within the BSA flow southwest and northeast through the BSA, and ultimately flow ~~out of the BSA~~ to Harper Dry Lake. It appears that only a few southern features within the BSA might convey flows south to the Mohave River. Figure 9 depicts the BSA and associated USGS blue-line features as well as some of the larger ~~the~~ potential

jurisdictional features mapped by ICF during the site visits and through a desktop review of the BSA (Google Earth aerial dated July 2011). There are many additional potential jurisdictional features that would not show for this broad scale of mapping.

As discussed in Section 3.7, *Biological Resources*, the U.S. Army Corps of Engineers has determined that Harper Dry Lake is an isolated water and is not considered a water of the United States; thus tributaries to Harper Dry Lake are also not waters of the United States. However, both Harper Dry Lake and its tributaries are waters of the state. Harper Dry Lake and its tributaries are under the jurisdiction of the Lahontan Regional Water Quality Control Board in regards to the Porter Cologne Water Quality Act, and the lake and tributaries are also under the jurisdiction of the California Department of Fish and Wildlife under Section 1600 of the California fish and Game Code in regards to potential lake or streambed alteration. The BSA includes a portion of the Harper Lake playa. The exact jurisdictional boundaries of Harper Dry Lake have not been delineated in the area of the BSA; it is possible that portions of the playa may be part of the jurisdictional boundary of the lake if they are at the same elevation as the rest of the lake.

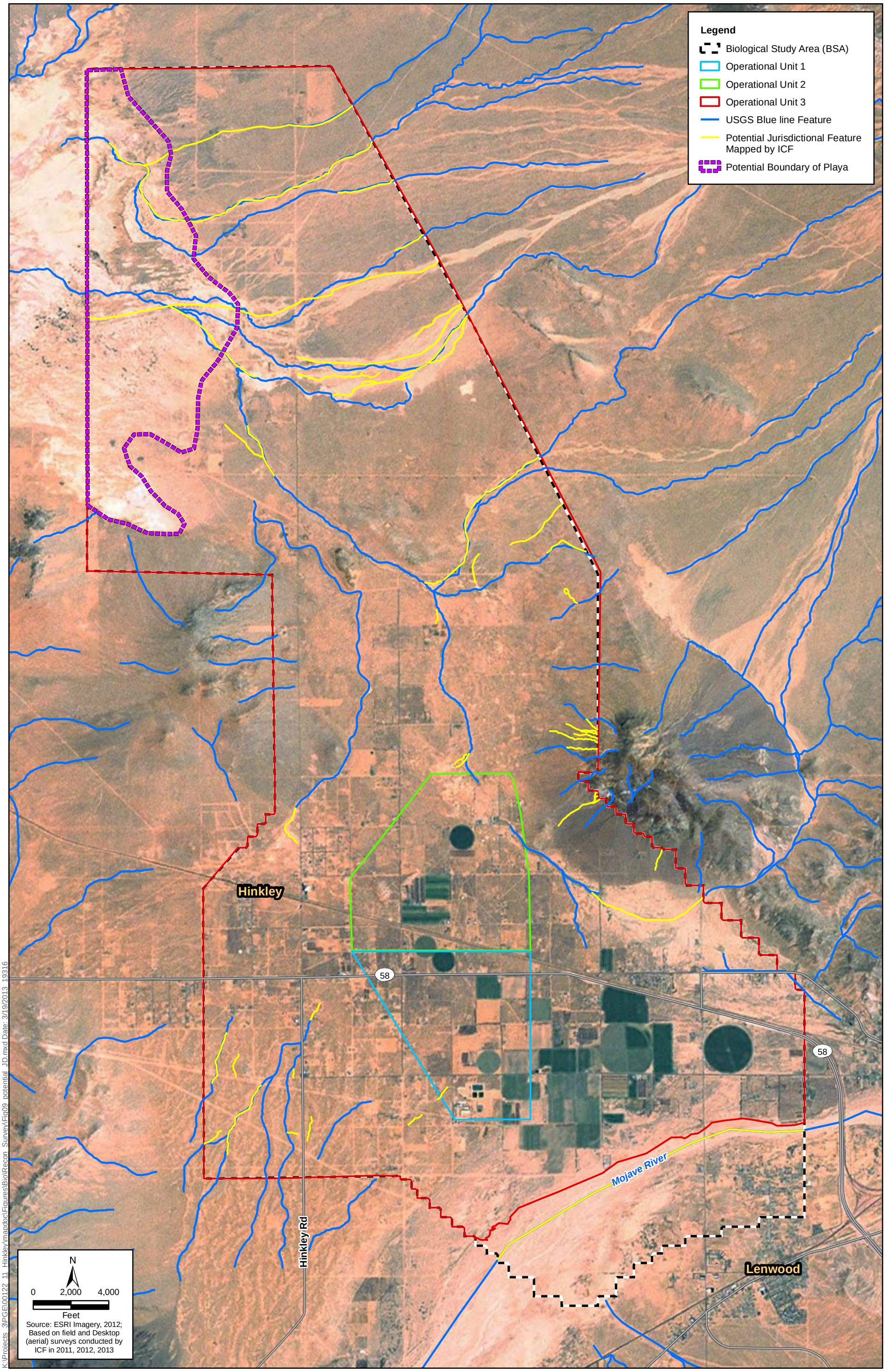

Figure 9
Potential Jurisdictional Features Mapped by ICF
Biological Resources Report
Hinkley Groundwater Remediation Project

Chapter 4
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4.2 Personal Communications

Knutson, Robert. 2012~~2011~~. Former Pacific Gas and Electric biologist. Email correspondence. ~~to~~ Robert Knutson provided Mikael Romich, ICF with a copy of 2008 logs of desert tortoise and burrowing owl recorded in the study area.

Attachment A
Site Photographs

Photograph: 1

Photo Date: December 20, 2011

Location: Central portion of project area

Direction: View facing south

Comment: Photo depicts allscale scrub vegetation north of Halstead Road and west of Hinkley Road

Photograph: 2

Photo Date: December 20, 2011

Location: Southwest corner of project area

Direction: View facing northeast

Comment: Photo depicts creosote bush scrub community located north of Riverview Road

Photograph: 3

Photo Date: December 20, 2011

Location: Central portion of project area

Direction: View facing east

Comment: Photo depicts playa with sparse allscale scrub community located south of Halsted Road

	**Photograph:** 4 **Photo Date:** December 20, 2011 **Location:** Southern portion of project area **Direction:** View facing north **Comment:** Photo depicts red brome or Mediterranean grass grassland north of Santa Fe Avenue
	**Photograph:** 5 **Photo Date:** December 20, 2011 **Location:** Near southwestern portion of project area **Direction:** View facing east **Comment:** View of desert wash from top of berm north of the Mojave River
	**Photograph:** 6 **Photo Date:** December 20, 2011 **Location:** Near center of project area **Direction:** View facing east **Comment:** Photo depicts typical topography and scrub cover of the project area in the central area of the project north of Halstead Road

Photograph: 7

Photo Date: January 14, 2013

Location: Near the western border of the project area

Direction: View facing East

Comment: Photo depicts typical scrub cover of the project area in the northwestern portion of the project area south of Holstead Road.

Photograph: 8

Photo Date: January 14, 2013

Location: Near the western border of the project area

Direction: View facing South

Comment: Photo depicts typical scrub cover in sand dunes located in the northwestern portion of the project area south of Holstead Road.

Photograph: 9

Photo Date: January 14, 2013

Location: Near the northwestern border of the project area

Direction: View facing South

Comment: Photo depicts typical scrub cover of the project area in the northwestern corner of the project area

Photograph: 10

Photo Date: January 14, 2013

Location: Near the western border of the project area

Direction: View facing Southwest

Comment: Photo depicts one of the desert tortoise burrows mapped during the January 13 site visit in the northwestern portion of the project area west of Orchard Road

Photograph: 11

Photo Date: January 14, 2013

Location: Near the central portion of the project area

Direction: View facing North

Comment: Photo depicts habitat located in the central portion of the project area south of BN Ranch Road and West of Hinkley Road

Photograph: 12

Photo Date: January 14, 2013

Location: Near the eastern border of the project area

Direction: View facing West

Comment: Photo depicts desert wash habitat located in the eastern portion of the project area immediately south of Grasshopper Road.

Attachment B

Plant Species Observed

Attachment B - Observed Flora of Hinkley Project Site

Scientific Name	Common Name	Special Status
CONIFERS		
Pinaceae - Pine Family		
Pinus sp.	Pine	
GNETALES		
Ephedraceae - Ephedra Family		
Ephedra sp.	Ephedra	
MONOCOTS		
Agavaceae - Agave Family		
Yucca brevifolia	Joshua Tree	
Arecaceae - Palm Family		
* *Phoenix canariensis*	Canary Island Date Palm	
* *Washingtonia robusta*	Mexican Fan Palm	
Poaceae - Grass Family		
* *Bromus madritensis ssp. rubens*	Red Brome	
* *Bromus tectorum*	Cheat Grass	
Pleuraphis rigida	Galleta Grass	
* *Schismus barbatus*	Common Mediterranean Grass	
Stipa hymenoides	Indian Ricegrass	
Stipa speciosum	Desert Needlegrass	
EUDICOTS		
Asteraceae - Sunflower Family		
Ambrosia dumosa	White Bur-Sage	
Ambrosia salsola	Burrobush	
Baileya pauciradiata	Desert Marigold	
Gutierrezia microcephala	Sticky Snakeweed	
Malacothrix glabrata	Desert Dandelion	
Xylorhiza tortifolia var. tortifolia	Mojave Woody Aster	
Boraginaceae - Borage Family		
Amsinckia sp.	Fiddleneck	
Cryptantha sp.	Common Cryptantha	
Brassicaceae - Mustard Family		
* *Sisymbrium irio*	London Rocket	

Scientific Name	Common Name	Special Status
Cactaceae - Cactus Family		
Cylindropuntia echinocarpa	Silver Cholla	
Chenopodiaceae - Goosefoot Family		
Atriplex canescens	Four-wing Saltbush	
Atriplex polycarpa	Allscale Saltbush	
Atriplex spinifera	Mojave Saltbush	
Grayia spinosa	Spiny Hopsage	
Krascheninnikovia lanata	Winterfat	
* *Salsola tragus*	Prickly Russian-Thistle	
Suaeda nigra	Bush Seepweed	
Euphorbiaceae - Spurge Family		
Croton californicus	California Croton	
Fabaceae - Legume Family		
Lupinus bicolor	Miniature Lupine	
* *Parkinsonia aculeata*	Mexican Palo Verde	
Geraniaceae - Geranium Family		
* *Erodium cicutarium*	Red-Stemmed Filaree	
Loasaceae - Loasa Family		
Petalonyx thurberi ssp. thurberi	Thurber's Sandpaper Plant	
Onagraceae - Evening Primrose Family		
Camissonia sp.	Evening Primrose	
Polemoniaceae - Phlox Family		
Eriastrum sp.	Eriastrum	
Polygonaceae - Buckwheat Family		
Chorizanthe spinosa	Mojave Spineflower	CRPR 4.2
Eriogonum sp.	Annual Buckwheat	
Eriogonum inflatum	Desert Trumpet	
Solanaceae - Nightshade Family		
Lycium cooperi	Peach Desert Thorn	
Tamaricaeae - Tamarisk Family		
* *Tamarix ramosissima*	Tamarisk	
Zygophyllaceae - Caltrop Family		
Larrea tridentata	Creosote Bush	

Scientific Name	Common Name	Special Status

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
SR = Rare

CRPR – California Rare Plant Rank
1A. Presumed extinct in California
1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

Threat Ranks
.1 - Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

Note that in March, 2010, CDFG changed the name of “CNPS List” or “CNPS Ranks” to “California Rare Plant Rank” (or CRPR). This was done to reduce confusion over the fact that CNPS and DFG jointly manage the Rare Plant Status Review groups that the rank assignments are the product of a collaborative effort and not solely a CNPS assignment.

Attachment C

Wildlife Species Observed

Attachment C. Wildlife Species Detected

Common Name	Scientific Name	Special Status
VERTEBRATES		
Birds		
Rock Pigeon	**Columba livia*	
House Sparrow	**Passer domesticus*	
Eurasian Collared-Dove	**Streptopelia decaocto*	
European Starling	**Sturnus vulgaris*	
Red-tailed Hawk	*Buteo jamaicensis*	
California Quail	*Callipepla californica*	
House Finch	*Carpodacus mexicanus*	
Northern Harrier	*Circus cyaneus*	CSC
American Crow	*Corvus brachyrhynchos*	
Common Raven	*Corvus corax*	
Yellow-rumped Warbler	*Dendroica coronata*	
California Horned Lark	*Eremophila alpestris actis*	
Prairie Falcon	*Falco mexicanus*	
American Kestrel	*Falco sparverius*	
Loggerhead Shrike	*Lanius ludovicianus*	CSC
Northern Mockingbird	*Mimus polyglottos*	
Savannah Sparrow	*Passerculus sandwichensis*	
Say's Phoebe	*Sayornis saya*	
Western Meadowlark	*Sturnella neglecta*	
Mourning Dove	*Zenaida macroura*	
White-crowned Sparrow	*Zonotrichia leucophrys*	
Mammals		
Antelope Ground Squirrel	*Ammospermophilus leucurus*	
Coyote	*Canis latrans*	
Black-tailed Jackrabbit	*Lepus californicus*	

Common Name	Scientific Name	Special Status

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
CSC = California Species of Special Concern
CFP = California Fully Protected Species

Attachment D

Special-Status Species ~~Tables~~Information

Table D-1. Special-Status Plant Species with Potential to Occur in the Project Area

Special-Status Plants	Life Form and Habitat	Flower Season	Status	Occurrence Probability	Comments
chaparral sand-verbena *Abronia villosa* var. *aurita*	Annual herb. Coastal scrub and mostly broad alluvial fans and benches. Sandy soils. Elevations from 260 to 5,250 feet.	January–August	Federal: none State: none CRPR: 1B.1 BLM: S	Less than reasonable	A single collection was made within the BSA on Lenwood Road in 1976 (Consortium of California Herbaria 2012, California Department of Fish and Game 2011a). However, this occurrence is thought to be misidentified and has been removed from the CNDDB dataset, as the remaining collections for this species are from the coastal plain and low desert areas As such, it was determined that chaparral sand-verbena has a less than reasonable potential to occur within the BSA.
Lane Mountain milkvetch *Astragalus jaegerianus*	Perennial herb. Joshua Tree woodland and Mojavean desert scrub. Shallow sandy soils within areas of exposed or partially exposed granitic bedrock. Elevations from 2,952 to 3,936 feet.	April–June	Federal: endangered State: none CRPR: 1B.1	Low to moderate	Portions of the scrub on site contain some suitability for the species, however, the entire site is below the known elevational range of the species.
Lancaster milkvetch *Astragalus preussii* var. *laxiflorus*	Perennial herb. Chenopod scrub. Known from elevations around 2,296 feet.	March–May	Federal: none State: none CRPR: 1B.1	Low	The saltbush scrub provides suitable habitat for this species, however, historical records suggest that this plant does not occur in the vicinity/region of the project site.
Mohave spineflower *Chorizanthe spinosa*	Annual herb. Chenopod scrub, Joshua Tree woodland, playas and mojavean desert scrub. From 20 to 4,265 feet.	March–July	Federal: none State: none CRPR: 4.2	Observed within playa habitat.	Confirmed present (ICF, Klein 2013). High potential to be found on the edges of playas.
Clokey's cryptantha *Cryptantha clokeyi*	Annual herb. Mojavean desert scrub. Elevations from 2,378 to 4,477 feet.	April	Federal: none State: none CRPR: 1B.2	Moderate	The Mojavean scrub on the site provides suitable habitat for the species.
Desert cymopterus *Cymopterus deserticola*	Perennial herb. Joshua Tree woodland and Mojavean desert scrub with sandy substrates. From 2,066 to 4,920 feet.	March–May	Federal: none State: none CRPR: 1B.2 BLM: S	Moderate to high	The saltbush scrub, allscale scrub and playa habitats on site provide suitable habitat for this species. Historical records indicate the plants presence on site (CNNDB). Observed in 2013 (Klein

Special-Status Plants	Life Form and Habitat	Flower Season	Status	Occurrence Probability	Comments
					2013)
Barstow woolly sunflower *Eriophyllum mohavense*	Annual herb. Saltbush scrub, Mojavean desert scrub and playas. From 1,650 to 3,148 feet.	March–May	Federal: none State: none CRPR: 1B.2 BLM: S	Moderate to high	The site contains suitable scrub and playa habitat for this species.
Mojave menodora *Menodora spinescens* var. *mohavensis*	Perennial deciduous shrub. Mojavean desert scrub, and in areas with Andesite gravel on rocky hillsides and in canyons. From 2,263 to 6,560 feet.	April–May	Federal: none State: none CRPR: 1B.2 BLM: S	Low to moderate	Portions of the site, particularly the eastern edges adjacent to hillslopes have the potential to support this species.
Spinyhair blazing star *Mentzelia tricuspis*	Annual herb. Sandy and or gravelly Mojavean desert scrub and desert washes. From 490 to 4,200 feet.	March–May	Federal: none State: none CRPR: 1B.2	Moderate	The scrub habitats and wash habitats within the site have the potential to support this species.
Creamy blazing star *Mentzelia tridentata*	Annual herb. Mojavean desert scrub in association with gravelly, rocky or sandy substrates. From 2,296 to 3,805 feet.	March–May	Federal: none State: none CRPR: 1B.3 BLM: S	Moderate	Portions of the site, particularly the rocky slopes on the eastern edges of the site have the potential to support this species.
Mojave monkeyflower *Mimulus mohavensis*	Annual herb. Joshua Tree woodland, Mojavean desert scrub and sandy or gravelly places such as washes. From 1,968 to 3,936 feet.	April–June	Federal: none State: none CRPR: 1B.2 BLM: S	Moderate to high	Historical records indicate the plants presence on site (CNNDB).
Beaver Dam breadroot *Pediomelum castoreum*	Perennial herb. Joshua Tree woodland and Mojavean desert scrub within sandy washes and road cuts. From 2,000 to 5,002 feet.	April–May	Federal: none State: none CRPR: 1B.2 BLM: S	Moderate	The scrub and wash habitats present on site, particularly on the eastern side of the site support suitable habitat for this species. Observed on site (Klein 2013).
Parish's phacelia *Phacelia parishii*	Annual herb. Mojavean desert scrub and clay or alkaline playas. From 1,771 to 3,936 feet.	April–June	Federal: none State: none CRPR: 1B.1 BLM: S	Low to moderate	A single 1884 collection was made east of the project site near Barstow, however, the saltbush, all scale scrub and playa habitat on site support suitable habitat for this species.
Utah glasswort *Sarcocornia utahensis*	Perennial deciduous shrub. Chenopod scrub and alkaline playa. Known from around 1,094 feet.	August–September	Federal: none State: none CRPR: 2.2	Low	The saltbush scrub and playa habitats on site support suitable habitat for this species, however the site is above the known elevational range of the species.
Palmer's jackass clover *Wislizenia refracta* ssp. *palmeri*	Perennial deciduous shrub. Chenopod scrub, desert dunes, Sonoran desert scrub and Sonoran thorn woodland.	January–December	Federal: none State: none CRPR: 2.2	Low	The saltbush scrub and playa habitat have some potential to support this plant. However, this plant is known to

Special-Status Plants	Life Form and Habitat	Flower Season	Status	Occurrence Probability	Comments
	From below 984 feet.				be associated with the lower Sonoroan desert.
~~Special-Status Vegetation Communities~~			~~Conservation Status~~	~~Occurrence Probability~~	
~~Transmontane Alkali Marsh~~			~~CNDDB~~	~~Confirmed Absent~~	

Sources: Consortium of California Herbaria 2012; California Department of Fish and Game 2011a (See Chapter 4, *References,* of the BSR).

Notes:

BSA = biological survey area

CNDDB = California Natural Diversity Database

CRPR = California Rare Plant Rank

California Rare Plant Rank (CRPR)

List 1A (Presumed extinct in California)

List 1B (Rare, threatened or endangered in California and elsewhere)

List 1B.1 (Seriously endangered in California)

List 1B.2 (Fairly endangered in California)

List 1B.3 (Not very endangered in California)

List 2 (Presumed extinct in California, but more common elsewhere)

Bureau of Land Management (BLM)

S = sensitive (plants found on BLM lands whose survival is of concern due to: 1) their limited distribution; 2) low number of individuals and/or populations; and 3) potential threats to habitat.

[a] Occurrence Codes

Confirmed Absent: Confirmed to be absent on the study area as a formal and/or practical matter. Typically based on results of focused surveys.

Less than Reasonable: Although occurrence might be remotely possible, the likelihood of occurrence is less than that required for any potentially applicable regulatory threshold. Furthermore, the likelihood of meaningful value of the site to any population(s) of this taxon is less than reasonable.

Low: Occurrence of the species is reasonable but unlikely because of some combination of facts, for example: (1) the study area was the subject of unsuccessful searches conducted under relevant and reasonable circumstances, (2) potential habitat present is marginal or minimal in extent, (3) the best available information suggests the species is absent from the study area, and/or (4) available information sheds no clear light on the species' likelihood in the study area, but it is known to be rare at best in the vicinity. Neither the species nor any indication of its presence was detected.

Moderate: The study area is within the range of the species, and contains potentially appropriate habitat. Neither individuals nor diagnostic signs were detected. It is nevertheless reasonable that some individuals may have been overlooked.

High: The study area is known to be within the range of the species, and contains potential habitat with a high likelihood of occupancy. Although no individuals or diagnostic signs were detected during current fieldwork by a qualified observer, it is likely that it is present to some degree given the best available information.

Confirmed Present: Confirmed present by a qualified biologist or other reliable source and there is no specific evidence that the species has subsequently become absent. Depending on the species and other information available, it may or may not be possible to determine what portions of the study area are currently in use without further studies.

Table D-2. Special-Status Wildlife Species with Potential to Occur in the Project Area

Species/Natural Communities	Special Status[a]	Requirements	Occurrence Probability[b]	Comments
ANIMALS				
Arroyo Toad *Anaxyrus californicus*	FE, SSC	This species is currently thought to be restricted to the headwaters of large streams that have persistent water from March to mid-June and also have shallow, gravely pools less than 18 inches deep adjacent sandy terraces. Breeding pools must be open and shallow with minimal current, and with a sand or pea gravel substrate overlain with sand or flocculent silt (Sweet 1989). Adjacent banks must provide open, sandy or gravely terraces with very little herbaceous cover for adult and juvenile foraging areas, within a moderate riparian canopy of cottonwood, willow, or oak. Heavily shaded pools are unsuitable for larvae and juvenile toads due to lower water and soil temperatures and poor algal mat development (Sweet 1992). Juveniles favor areas which remain damp and contain less than 10 percent cover (Sweet 1992). Adults use terraces in the 100-year flood zone, which may extend up to 100 m from the stream (Campbell *et.al.* 1996), Adults excavate shallow burrows on the terraces where they shelter during the day when the surface is damp or during longer intervals in the dry season.	Less than reasonable	A single 1949 record in the CNDDB is associated with the Barstow quadrangle. No habitat is present on the site that is suitable for the species.
Burrowing owl *Athene cunicularia*	SSC BLM-S	Inhabits open, dry, nearly or quite level, grassland; prairie; desert floor; shrubland should be considered potential habitat if shrub cover is below 30%. In coastal Southern California, a substantial fraction of birds are found in microhabitats highly altered by humans, including flood control and irrigation basins, dikes, and banks, abandoned fields surrounded by agriculture, and road cuts and margins. In the western United States burrowing owls are only rarely known to construct their own burrows; strong association between burrowing owls and burrowing mammals, especially ground squirrels (*Spermophilus* spp.); however burrowing owls will also occupy human-made niches such as banks and ditches, piles of broken concrete, and even abandoned structures.	Confirmed Present	Suitable vegetation communities/habitat for foraging and nesting is present.

Species/Natural Communities	Special Status[a]	Requirements	Occurrence Probability[b]	Comments
Bendire's thrasher *Toxostoma bendirei*	SSC BLM-S	Inhabits Joshua tree woodland with scattered desert shrubs such as creosote bush (*Larrea tridentata*) and sweet bush (*Bebbia juncea*). Also occurs in the eastern Mojave in areas with high numbers of Opuntia, cholla or cactus. Known to be a common summer resident in Joshua Tree National Park.	Less than reasonable	The site lacks Joshua Tree woodland habitat and areas with a high cover of cactus species.
Western snowy plover *Charadrius alexandrinus nivosus*	FT, SSC	Found on sandy beaches, salt pond levees, and shores of large alkali lakes. Needs sandy, gravelly, or friable soils for nesting. Breeds primarily on coastal beaches above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Wintering snowy plovers are found on many of the beaches used for nesting as well as in human-made salt ponds, and on estuarine sand and mudflats.	Less than reasonable	No suitable habitat on or adjacent to the site. Species has not been documented within the site and the surrounding 12 quads since 1978 in which one individual was observed.
Northern harrier *Circus cyaneus*	SSC*	Breeds and forages in a variety of open (treeless) habitats that provide adequate vegetative cover, an abundance of suitable prey, and scattered perches such as shrubs or fence posts. In California, such habitats include freshwater marshes, brackish and saltwater marshes, wet meadows, weedy borders of lakes, rivers and streams, annual and perennial grasslands (including those with vernal pools), weed fields, ungrazed or lightly grazed pastures, some croplands (especially alfalfa, grain, sugar beets, tomatoes, and melons), sagebrush flats, and desert sinks. They nest on the ground, mostly within patches of dense, often tall, vegetation in undisturbed areas.	Foraging-Confirmed Present Nesting–Low	Closest known breeding location is at Harper Dry Lake, but has not been suspected there since the mid-1990s.
Western yellow-billed cuckoo *Coccyzus americanas occidentalis*	FC, SE	Inhabitant of extensive, mature, riparian forests; has declined from a fairly common, local breeder in much of California 60 years ago, to virtual extirpation with only a handful of tiny populations remaining in all of California today. Losses are tied to obvious loss of nearly all suitable habitat, but other factors may also be involved. Relatively broad, well-shaded riparian forests are utilized, although it tolerates some disturbance. A specialist to some degree on tent caterpillars, with remarkably fast development of young covering only 18–21 days from incubation to fledging.	Less than reasonable	No suitable habitat on or adjacent to the site. Species has not been documented within the site and the surrounding eight quads since 1986 in which one individual was observed.

Species/Natural Communities	Special Status[a]	Requirements	Occurrence Probability[b]	Comments
Mohave tui chub *Gila bicolor mohavensis*	FE, SE	Endemic to the Mojave River basin. Prefers lake habitats, always associated with deep pools and slough-like areas, and do poorly in fast-flowing streams. Is adapted for harsh water qualities including alkaline waters and extreme temperatures.	Absent	Had once occurred on site as a result of transplanting individuals. Extirpated due to the closure of facility in 1992.
Desert tortoise *Gopherus agassizii*	FT, SE	Mojave and Sonoran deserts in southwestern Utah, southern Nevada, southeastern California, and western Arizona in the United States. Habitat includes creosote/cactus/shadscale scrub from sandy flats to rocky foothills, including alluvial fans, washes, and canyons where suitable soils for den construction might be found. It is found from near sea level to around 3,500 feet in elevation.	Confirmed Present	Suitable vegetation communities/habitat present. Individuals and sign observed during previous surveys.
Loggerhead shrike *Lanius ludovicianus*	SSC*	Forages in open country of many types (including non-intensive agricultural areas) and nests in small trees and large shrubs, often at the edges of such open areas. Like most birds of prey, generally occurs at low densities. The species is widely distributed in Southern California with some seasonal movements evident.	Confirmed Present	Suitable habitat occurs throughout the site. Several individuals were observed within the site during the December 2011 survey.
Mohave river vole *Microtus californicus mohavensis*	SSC	Occurs in moist habitats including meadows, freshwater marshes, and irrigated pastures in the vicinity of the Mojave River. Suitable habitat is associated with ponds and irrigation canals along with the Mojave River. Burrows into soft soils. Elevations of known localities range between 750–823 meters (2,325–2,700 feet).	Low-Moderate	Suitable habitat may occur on site within the agricultural areas.
Yuma clapper rail *Rallus longirostris yumanensis*	FE, ST	Found in freshwater and alkali marshes dominated by stands of emergent vegetation interspersed with areas of open water and drier, upland benches. Prefers mature marsh stands along margins of shallow ponds with stable water levels. Nest sites selected by near upland areas in shallow sites dominated by mature vegetation, often in the base of a shrub.	Less than reasonable	No suitable habitat on or adjacent to the site. Species has not been documented within the site and the surrounding eight quads since 1977 in which one individual was observed.

Species/Natural Communities	Special Status[a]	Requirements	Occurrence Probability[b]	Comments
Mohave ground squirrel *Spermophilus mohavensis*	ST	Restricted to the Mojave Desert in San Bernardino, Los Angeles, Kern, and Inyo Counties. Optimal habitats are open desert scrub, alkali desert scrub, and Joshua tree woodland. Feeds in annual grasslands. Prefers sandy to gravelly soils, avoids rocky areas. Uses burrows at base of shrubs for cover	Confirmed Present	Suitable vegetation communities/habitat present. A CNDDB occurrence is mapped within the BSA and an individuals was observed during previous surveys.
American badger *Taxidea taxus*	SSC	Found in open, drier stages of many shrub, herbaceous, and woodland communities where soils are dry and suitable for burrowing. Sensitive to fragmentation of open spaces. Generally requires good diversity and abundance of rodent prey.	Moderate	Though there are no records for occurrence on site, suitable habitat is present. Records for this species occur approximately 3 miles from the site as recently as 2007.
Mojave fringe-toed lizard *Uma scoparia*	SSC BLM-S	Restricted to areas with fine, loose, windblown sand including dunes, dry lakebeds, desert washes, riverbanks, sparse desert scrub habitats, and isolated pockets against hillsides.	High	Suitable habitat is present in the BSA and the CNDDB has recorded occurrences within the BSA.

Notes:
BSA = biological survey area
CNDDB = California Natural Diversity Database

[a] Status Definitions

FE	Federally Endangered
FT	Federally Threatened
FC	Federal Candidate species
SE	State Endangered
ST	State Threatened
SSC	State Species of Special Concern
SSC*	State Species of Special Concern only when breeding
BLM-S	A BLM sensitive animal, defined as (1) under status review by the FWS/NMFS; or (2) whose numbers are declining so rapidly that Federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats. Existing California-BLM policy concerning the designation of sensitive species identifies two conditions that must be met before a species may be considered as BLM sensitive: (1) a significant population of the species must occur on BLM-administered lands, and (2) the potential must exist for improvement of the species' condition through BLM management.

[b] Occurrence Codes

Confirmed Absent: Confirmed to be absent on the study area as a formal and/or practical matter. Typically based on results of focused surveys.

Less than Reasonable: Although occurrence might be remotely possible, the likelihood of occurrence is less than that required for any potentially applicable regulatory threshold. Furthermore, the likelihood of meaningful value of the site to any population(s) of this taxon is less than reasonable.

Low: Occurrence of the species is reasonable but unlikely because of some combination of facts, for example: (1) the study area was the subject of unsuccessful searches conducted under relevant and reasonable circumstances, (2) potential habitat present is marginal or minimal in extent, (3) the best available information suggests the species is absent from the study area, and/or (4) available information sheds no clear light on the species' likelihood in the study area, but it is known to be rare at best in the vicinity. Neither the species nor any indication of its presence was detected.

Moderate: The study area is within the range of the species, and contains potentially appropriate habitat. Neither individuals nor diagnostic signs were detected. It is nevertheless reasonable that some individuals may have been overlooked.

High: The study area is known to be within the range of the species, and contains potential habitat with a high likelihood of occupancy. Although no individuals or diagnostic signs were detected during current fieldwork by a qualified observer, it is likely that it is present to some degree given the best available information.

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Appendix D
Air Quality and Climate Change Background Information and Calculations

Appendix D

Air Quality and Climate Change Background Information and Calculations

D.1 Air Quality

D.1.1 Diesel Engine Rules

The EPA established a series of increasingly strict emission standards for new engines to reduce emissions from off-road diesel equipment. Locomotives and marine vessels are exempt from this rule. Manufacturers of off-road diesel engines would be required to produce engines meeting certain emission standards based on the model year the engine was manufactured under the following compliance schedule:

- Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower (HP) category.
- Tier 2 standards were phased in from 2001 to 2006.
- Tier 3 standards were phased in from 2006 to 2008.
- Tier 4 standards, which likely will require add-on emissions control equipment to attain them, will be phased in from 2008 to 2015.

The EPA established a series of increasingly strict emissions standards for new engines to reduce emissions from on-road, heavy-duty diesel trucks by signing the Heavy-Duty Highway Rule in December 2000. Manufacturers are required to produce new diesel vehicles that meet PM and NO_X emission standards beginning with model year 2007 and phased-in between 2007 and 2010. The phase-in is based on a percent-of-sales basis: 50% from 2007 to 2009 and 100% in 2010 (U.S. Environmental Protection Agency 2000).

D.1.2 Criteria Air Pollutants

D.1.2.1 Ozone

Ozone is a respiratory irritant that can cause severe ear, nose, and throat irritation and that increases susceptibility to respiratory infections. It is also an oxidant that causes extensive damage to plants through leaf discoloration and cell damage. It can cause substantial damage to other materials as well, such as synthetic rubber and textiles.

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors—reactive organic gases (ROG) and nitrogen oxides (NO_X)—react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NO_X, are mainly emitted by mobile sources and by stationary combustion equipment.

D.1.2.2 Hydrocarbons

Hydrocarbons are organic gases that are made up of hydrogen and carbon atoms. There are several subsets of organic gases, including ROGs and volatile organic compounds (VOCs). ROGs are defined by state rules and regulations; VOCs are defined by federal rules and regulations. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels, or as a product of chemical processes. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry-cleaning solutions, and paint (through evaporation).

The health effects of hydrocarbons result from the formation of ozone. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen though displacement. Carcinogenic forms of hydrocarbons are considered toxic air contaminants. There are no separate health standards for ROGs, although some are also toxic; an example is benzene, which is both an ROG and a carcinogen.

D.1.2.3 Nitrogen Oxides

Nitrogen oxides (NO_X) are a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone, and react in the atmosphere to form acid rain. Nitrogen dioxide (NO_2), often used interchangeably with NO_X, is a brownish, highly reactive gas that is present in all urban environments. The major human sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (U.S. Environmental Protection Agency 2010). The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a particular geographical area may not be representative of local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects primarily depends on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, such as coughing, difficulty breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe symptomatic NO_2 intoxication after acute exposure has been linked to prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung function (U.S. Environmental Protection Agency 2010).

D.1.2.4 Carbon Monoxide

Carbon Monoxide (CO) has little effect on plants and materials, but it can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects range from slight headaches to nausea to death.

Motor vehicles are the primary source of CO emissions in most areas. In the project area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These

conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures.

Dramatic reductions in CO levels across California, including a 50% decrease in statewide peak CO levels between 1980 and 2004, have been witnessed during the past several decades, primarily due to requirements for cleaner vehicles, equipment, and fuels (California Air Resources Board 2004).

D.1.2.5 Particulate Matter

Particulates can damage human health and retard plant growth. They also reduce visibility, soil buildings and materials, and cause corrosion. Health concerns associated with suspended particulate matter focus on particles small enough to be drawn into the lungs when inhaled: PM10 (particles less than 10 microns in size) and PM2.5 (particles less than 2.5 microns in size).

Particulate emissions are generated by a wide variety of sources in the air quality study area, including agricultural activities, industrial operations, vehicles (e.g., dust suspended by vehicle traffic and construction equipment), and secondary aerosols (formed by reactions in the atmosphere).

D.1.2.6 Sulfur Oxides

Sulfur oxides (SO_X) are any of several compounds of sulfur and oxygen, of which the most relevant to air quality is sulfur dioxide (SO_2). SO_2 is produced by coal and oil combustion and such stationary sources as steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant that causes the bronchioles to constrict with inhalation at 5 parts per million (ppm) or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

D.1.3 Toxic Air Contaminants

Toxic Air Contaminants (TACs) are non-criteria pollutants that can result in adverse human health effects. Unlike criteria pollutants, no ambient standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, the California Air Resources Board (ARB) has consistently found that there are no levels or thresholds below which exposure is risk-free.

Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). TACs include air pollutants that can produce adverse human health effects, including carcinogenic effects, after short-term (acute) or long-term (chronic) exposure. Examples of TAC sources within the Mojave Desert Air Basin (MDAB) include industrial processes, dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel combustion sources. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor, called a Hazard Index, is used to evaluate risk.

D.2 Climate Change

D.2.1 Regulatory Setting

D.2.1.1 Federal

Massachusetts, et al. vs. U.S. Environmental Protection Agency (2007)

Twelve U.S. states and cities, including California, in conjunction with several environmental organizations, sued to force EPA to regulate GHGs as a pollutant pursuant to the Clean Air Act (CAA) in Massachusetts, et al. v. Environmental Protection Agency 549 US 497 (2007). The court ruled that the plaintiffs had standing to sue, GHGs fit within the CAA's definition of a pollutant, and the EPA's reasons for not regulating GHGs were insufficiently grounded in the CAA.

United States Environmental Protection Agency Endangerment Finding (2009)

In its "Endangerment Finding," the EPA Administrator found that GHGs, as described above, in the atmosphere threaten the public health and welfare of current and future generations. The Administrator also found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare. Although the Finding of Endangerment does not place requirements on industry, it is an important step in EPA's process to develop regulation. This measure is a prerequisite to finalizing EPA's proposed GHG emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.

United States Environmental Protection Agency Mandatory Reporting Rule for Greenhouse Gas (2009)

Under the Mandatory Report Rule, suppliers of fossil fuels, manufacturers of vehicles and engines, and facilities that emit 25,000 MT or more per year of GHGs are required to report annual emissions to the EPA. The first annual reports for the largest emitting facilities, covering calendar year 2010, will be submitted to the EPA in 2011. The mandatory reporting rule does not limit GHG emissions but establishes a standard framework for emissions reporting and tracking of large emitters.

Update to Corporate Average Fuel Economy Standards (2009)

The 2009 Corporate Average Fuel Economy (CAFE) standards incorporate stricter fuel economy standards promulgated by the State of California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25% by 2016. Federal agencies are presently developing higher standards for the 2017 to 2025 period.

United States Environmental Protection Agency Cause or Contribute Finding (2010)

In its "Cause or Contribute Finding" the EPA Administrator found that the combined emissions of these well-mixed GHG from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare. This step is a predecessor to subsequent action to require new vehicles to improve their efficiency to reduce GHG emissions.

United States Environmental Protection Agency Regulation of GHG Emissions under the Clean Air Act (2010–2012, ongoing)

Under the authority of the Clean Air Act, the EPA is beginning to regulate GHG emissions starting with large stationary sources. In 2010, EPA set GHG thresholds to define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities. In 2012, EPA proposed a carbon pollution standard for new power plants.

D.2.1.2 State

Assembly Bill 1493—Pavley Rules (2002, amendments 2009)/Advanced Clean Cars (2011)

Known as "Pavley I," Assembly Bill (AB) 1493 standards are the nation's first GHG standards for automobiles. AB 1493 required ARB to adopt vehicle standards that will lower GHG emissions from new light duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as "Pavley II," now referred to as the "Advanced Clear Cars" measure) has been proposed for vehicle model years 2017–2020. Together, the two standards are expected to increase average fuel economy to roughly 43 mpg by 2020 and reduce GHG emissions from the transportation sector in California by approximately 14%. In June 2009, EPA granted California's waiver request enabling the state to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

EPA and ARB are currently working together on a joint rulemaking to establish GHG emissions standards for 2017 to 2025 model year passenger vehicles. The Interim Joint Technical Assessment Report for the standards evaluated four potential future standards ranging from 47 to 62 mpg in 2025 (U.S. Environmental Protection Agency et al. 2010). The official proposal was released by both EPA and ARB on December 7, 2011, and was unanimously approved by both EPA and ARB on January 26, 2012 (California Air Resources Board 2012).

Global Warming Solutions Act of 2006 (Assembly Bill 32) (2006)

AB 32 codified California's GHG emissions target by requiring that the state's global warming emissions be reduced to 1990 levels by 2020. Since being adopted, ARB, the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the Building Standards Commission have been developing regulations that will help meet the goals of AB 32 and Executive Order (EO) S-03-05. The Scoping Plan for AB 32 identifies specific measures to reduce GHG emissions to 1990 levels by 2020, and requires ARB and other state agencies to develop and enforce regulations and other initiatives for reducing GHGs. Specifically, the Scoping Plan articulates a key role for local governments, recommending they establish GHG reduction goals for both their municipal operations and the community consistent with those of the state (i.e., approximately 15% below current levels).

In March 2011, a San Francisco Superior Court enjoined the implementation of ARB's Scoping Plan, finding the alternatives analysis and public review process violated both the California Environmental Quality Act (CEQA) and ARB's certified regulatory program (*Association of Irritated Residents, et al. v. California Air Resources Board,* Case No. CPF-09-509562, March 18, 2011). In response to this litigation, ARB adopted the new CEQA document (*Final Supplement to the AB32 Scoping Plan Functional Equivalent Document*) on August 24, 2011. ARB staff re-evaluated the baseline in light of the economic downturn and updated the projected 2020 emissions to 545

MMTCO$_2$e. Two reduction measures (Pavley I and the Renewables Portfolio Standard [12–20%]) not previously included in the 2008 Scoping Plan baseline were incorporated into the updated baseline, further reducing the 2020 Statewide emissions projection to 507 MMTCO$_2$e. The updated forecast of 507 MMTCO$_2$e is referred to as the AB 32 2020 baseline. Reduction of an estimated 80 MMTCO$_2$e are necessary to reduce statewide emissions to the AB 32 target of 427 MMTCO$_2$e by 2020, which is approximately 11% below existing business as usual (BAU) (2006–2008 average) and 21% below 2020 BAU (California Air Resources Board 2011).

Executive Order S-01-07: Low Carbon Fuel Standard (2007)

EO S-01-07 essentially mandates (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established in California.[1]

Senate Bill 97 (2007)

Senate Bill (SB) 97 requires that the Office of Planning and Research (OPR) prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by CEQA. The Natural Resources Agency adopted Amendments to the CEQA Guidelines for GHG emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010. The adopted guidelines recommend quantification of GHG emissions, assessment of their significance, and adoption of feasible mitigation of GHG emissions when significant impacts are identified.

California Air Resources Board Mandatory Greenhouse Gas Reporting Rule (Title 17) (2007)

In December of 2007, ARB approved a rule requiring mandatory reporting of GHG emissions from certain sources, pursuant to AB 32. Facilities subject to the mandatory reporting rule must report their emissions either annually for large facilities or triennially for smaller facilities starting from 2010. In general the rule applies to facilities emitting more than 25,000 MT CO$_2$e in any given calendar year and electricity generating facilities with a nameplate generating capacity greater than 1 megawatt (MW) or emitting more than 2,500 MT CO$_2$e per year. Additional requirements apply to cement plants and entities that buy and sell electricity in the state.

Senate Bills 1078/107 and Executive Order S-14-08: Renewable Portfolio Standard (2008/2011)

SBs 1078 and 107, California's Renewable Portfolio Standard (RPS), obligates investor-owned utilities (IOUs), energy service providers (ESPs), and Community Choice Aggregations (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. CPUC and CEC are jointly responsible for implementing the program.

[1] ARB approved the LCFS on April 23, 2009, and the regulation became effective on January 12, 2010 (California Air Resources Board 2011). The U.S. Fresno Federal District court ruled in December 2011 that the LCFS violates the Commerce Clause of the U.S. Constitution and issued an injunction preventing California from implementing the LCFS. ARB appealed this ruling in early January 2012. While the legal issues are being resolved, given the pending appeal by ARB, it is assumed for the time being that the LCFS will be ultimately implemented by 2020 as proposed. If the LCFS were ultimately to be blocked from implementation due to federal legal constraints, the significance determinations herein would not be affected because LCFS reductions do not alter those significance determinations.

California SB 2 X1 sets forth a longer range target of procuring 33% of retail sales by 2020. This bill passed the legislature on March 29, 2011, and was signed by Governor Brown on April 12, 2011. The Pacific Gas and Electric (PG&E) RPS-Eligible Procurement was 17.7% in year 2010, while the Statewide average for the three largest electrical suppliers (PG&E, Southern California Edison [SCE], and San Diego Gas and Electric [SDG&E]) was 17.9%.

California Cap-and-Trade (2010)

Pursuant to the directives of AB 32, ARB approved measures on December 16, 2010, to enact a GHG cap-and-trade program for the state of California. The California cap-and-trade program would create a CO_2 market system with a GHG emissions cap that will be decreased over time. Building on the data required by the 2007 California Mandatory GHG Reporting rule, only stationary sources that emit more than 25,000 MT of CO_2e per year would be affected by the cap-and-trade program. These sources include mostly large operations such as power plants, refineries, cement plants, hydrogen production facilities, and other large, stationary sources. Official rulemaking associated with achieving this emissions cap was adopted by January 1, 2011 and adopted the final cap-and-trade regulation and adaptive management plan on October 20, 2011. The program commenced in January 2012 and compliance is set to begin in January 2013.

D.2.2 Global Climate Change Overview

Increasing levels of GHGs in the atmosphere result in an increase in the temperature of the Earth's lower atmosphere, a phenomenon which is commonly referred to as global warming or *climate change*. Warming of the Earth's lower atmosphere induces a suite of additional changes including changes in: global precipitation patterns; ocean circulation, temperature, and acidity; global mean sea level; species distribution and diversity; and the timing of biological processes. These large-scale changes are collectively referred to as *global climate change*.

The Intergovernmental Panel on Climate Change (IPCC) has been established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. As the leading authority on climate change science, their best estimates are that the average global temperature rise between 2000 and 2100 could likely range from 1.1 degrees Fahrenheit (°F) (assuming no increase in GHG emissions above 2000 levels) to 7.2°F (assuming substantial increase in GHG emissions) (Intergovernmental Panel on Climate Change 2007c). Large increases in global temperatures as high as 7.2°F could have massive deleterious impacts on natural and human environments.

Since the industrial revolution (approximately 1750), the concentration of CO_2 in the Earth's atmosphere has increased from 270 ppm to roughly 379 ppm. Atmospheric concentrations of methane (CH_4) and nitrous oxide (N_2O) have similarly increased since the beginning of the industrial age (Intergovernmental Panel on Climate Change 2007c). Over this same time period, global average surface temperature has increased by 1.1°F, global average sea level has increased by nearly 60 millimeters, and northern hemisphere snow cover (data available since 1920) has decreased by nearly 3 million square kilometers (Intergovernmental Panel on Climate Change 2007c). These recently recorded changes can be attributed with a high degree of certainty to increased concentrations of GHGs in the atmosphere (Intergovernmental Panel on Climate Change 2007c). Sinks of CO_2 (which remove, rather than emit, CO_2) include uptake by vegetation and dissolution into the ocean. Global GHG emissions greatly exceed the removal capacity of natural sinks. As a

result, concentrations of GHGs in the atmosphere are increasing (California Energy Commission 2006a).

GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and TACs. Criteria air pollutants and TACs, occur locally or regionally, and local concentrations respond to locally implemented control measures. The long atmospheric lifetimes of GHGs allow them to be transported long distances from sources and to become well-mixed, unlike criteria air pollutants, which typically exhibit strong concentration gradients away from point sources.

D.2.3 Description of Greenhouse Gases

The GHGs listed by the IPCC (2007a) (CO_2, CH_4, N_2O, hydrofluorocarbons [HFCs], perfluorinated carbons [PFCs], and sulfur hexafluoride [SF_6]) are discussed in this section in order of abundance in the atmosphere. California law and the CEQA Guidelines contain a similar definition of GHGs (Health and Safety Code 38505(g); California Code of Regulations, Title 14, Section 15364.5). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic (human-made) sources.[2]

D.2.3.1 Carbon Dioxide

CO_2 is the most important anthropogenic GHG and accounts for more than 75% of all GHG emissions caused by humans. Its atmospheric lifetime of 50–200 years ensures that atmospheric concentrations of CO_2 will remain elevated for decades even after mitigation efforts to reduce GHG concentrations are promulgated (Intergovernmental Panel on Climate Change 2007a). The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (including deforestation). Atmospheric CO_2 has increased from a pre-industrial concentration of 280 parts per billion (ppb) to 379 ppm in 2005 (Intergovernmental Panel on Climate Change 2007b).

D.2.3.2 Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a global warming potential (GWP, see *GHG Emissions Reporting* below) of 21 (Intergovernmental Panel on Climate Change 1996). Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal (National Oceanic and Atmospheric Administration 2005). Atmospheric CH_4 has increased from a pre-industrial concentration of 715 ppb to 1,774 ppb in 2005 (Intergovernmental Panel on Climate Change 2007b).

D.2.3.3 Nitrous Oxide

N_2O is a powerful GHG, with a GWP of 310 (Intergovernmental Panel on Climate Change 1996). Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. In the United States more than 70% of N_2O emissions are related to agricultural soil management practices, particularly fertilizer

[2] Although water vapor plays a substantive role in the natural greenhouse effect, the change in GHGs in the atmosphere due to anthropogenic actions is enough to upset the radiative balance of the atmosphere and result in global warming.

application. N_2O concentrations in the atmosphere have increased 18% from pre-industrial levels of 270 ppb to 319 ppb in 2005 (Intergovernmental Panel on Climate Change 2007b).

D.2.3.4 Sulfur Hexafluoride

SF_6, a human-made chemical, is used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, in semiconductor manufacturing, and also as a tracer chemical for the study of oceanic and atmospheric processes (U.S. Environmental Protection Agency 2006). In 2005, atmospheric concentrations of SF_6 were 5.6 parts per trillion (ppt) and steadily increasing in the atmosphere. SF_6 is the most powerful of all GHGs listed in IPCC studies, with a GWP of 23,900 (Intergovernmental Panel on Climate Change 1996).

D.2.3.5 Other High Global Warming Potential Gases

Emissions of HFCs and PFCs are primarily generated through industrial processes. Since the proposed project contains no major industrial processes, these are not included in this analysis. ~~GHG Emissions Reporting.~~

D.2.4 GHG Emissions Reporting

To simplify reporting and analysis, GHGs are commonly defined in terms of GWP. The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2e. The GWP of CO_2 is, by definition, 1. The GWP values used in this report are based on the IPCC Second Assessment Report (SAR) and United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines, and are defined in Table D-1. Although the IPCC Fourth Assessment Report (AR4) presents different GWP estimates, the current inventory standard relies on SAR GWPs to comply with reporting standards and for consistency with regional and national inventories (Intergovernmental Panel on Climate Change 2007a). The SAR GWPs are used in ARB's California inventory and AB 32 Scoping Plan estimates (California Air Resources Board 2010).

Emissions of SF_6 are generated through both industrial processes and electricity distribution. SF_6 emissions associated with project–related electricity consumption are included in the analysis herein.

Table D-1. Lifetimes and Global Warming Potentials of Several Greenhouse Gases

GHG	Global Warming Potential (100 years)	Lifetime (years)	2005 Atmospheric Abundance
CO_2 (ppm)	1	50–200	379
CH_4 (ppb)	21	9–15	1,774
N_2O (ppb)	310	120	319
SF_6 (ppt)	23,900	5.6	5.6

Sources: Intergovernmental Panel on Climate Change 1996, 2001:388–390.
ppm = parts per million.
ppb = parts per billion.
ppt = parts per trillion.

D.2.5 Impacts of Climate Change

Climate change is a complex phenomenon that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change will result globally and regionally in sea level rise as well as in changes in climate and rainfall, among other effects, there remains uncertainty with regard to characterizing the precise *local* climate characteristics and predicting precisely how various ecological and social systems will react to any changes in the existing climate at the local level. Regardless of this uncertainty in precise predictions, it is widely understood that substantial climate change is expected to occur in the future, although the precise extent will take further research to define. According to the IPCC, the average global temperature rise between 2000 and 2100 could likely range from 1.1°F (assuming no increase in GHG emissions above 2000 levels) to 7.2°F (assuming substantial increase in GHG emissions) (Intergovernmental Panel on Climate Change 2007c).

Scientists believe the global changes resulting from GHG emissions will have unique and potentially severe impacts in the western United States and California. Current research efforts coordinated through ARB, CEC, California Environmental Protection Agency (CalEPA), the University of California system, and others are examining the specific changes to California's climate that will occur as the Earth's surface warms. Scientists believe that climate change could affect the natural environment in California in the following ways (among others):

- Rising sea levels along the California coastline, particularly in San Francisco and the Sacramento–San Joaquin River Delta, from ocean expansion.
- Extreme heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent.
- An increase in heat-related human deaths and infectious diseases and a higher risk of respiratory problems caused by deteriorating air quality.
- Reduced snow pack and streamflow in the Sierra Nevadas, affecting water supplies and winter recreation.
- Potential increase in the severity of winter storms, affecting peak streamflows and causing flooding.
- Changes in growing-season conditions that could affect California agriculture, causing variations in crop quality and yield.
- Changes in the distribution of plant and wildlife species because of changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems are occurring at a time when California's population is expected to increase from 34 million to 59 million by 2040 (California Energy Commission 2006). As such, the number of people potentially affected by climate change, as well as the amount of anthropogenic GHG emissions expected to occur in the future, would occur in other parts of the world, with regional variations in the resources affected and vulnerability to adverse effects.

D.3 Calculations

The calculations for construction emissions, operational emissions, and health risk assessment are on the following pages.

After the calculations were completed for the Final EIR, updated information on the number of existing monitoring wells was received (see Appendix B in Volume II). Since the scaling approach to estimating future monitoring wells was based on an escalation from the existing number of monitoring wells (as shown in Appendix B), the estimate of future monitoring wells would also increase. However, the air calculations did not include the revised escalated monitoring well estimate. This would only change the air quality analysis in minor ways. For instance, the amount of land disturbed due to monitoring well installation would only change by perhaps 3 acres, if the escalated revised estimate were used. Given that the land disturbance of all of the action alternatives is on the scale of several hundred acres or more, this minor change would not change the conclusions of the EIR.

Appendix E
Notice of Preparation and Scoping Comments

California Regional Water Quality Control Board
Lahontan Region

Linda S. Adams
Secretary for
Environmental Protection

2501 Lake Tahoe Boulevard, South Lake Tahoe, California 96150
(530) 542-5400 • Fax (530) 544-2271
www.waterboards.ca.gov/lahontan

Arnold Schwarzenegger
Governor

November 24, 2010

TO ALL INTERESTED PERSONS:

NOTICE OF PREPARATION OF A DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

The California Regional Water Quality Control Board, Lahontan Region (Water Board) is the Lead Agency for the preparation of a Subsequent Environmental Impact Report (SEIR) for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the SEIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached Notice of Preparation.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. We have set the comment period deadline for no later than 5 pm on **December 31, 2010.**

Please send your response to Anne Holden at the address shown above. We will need the name for a contact person in your agency. You may also provide comments via email to aholden@waterboards.ca.gov or fax to (530) 544-2271.

Project Title: Final Groundwater Cleanup Strategy for Historical Chromium Discharges from Pacific Gas & Electric Company's Hinkley Compressor Station.

Project Applicant: Pacific Gas & Electric Company

Date: 11/24/2010

Signature: Lauri Kemper

Lauri Kemper, P.E.
Assistant Executive Officer
Phone: (530) 542-5436

Enclosure: Notice of Preparation of a Draft Subsequent Environmental Impact Report

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

AHL/clhT: NOP cover to residents.doc
File: PG&E Hinkley file

NOTICE OF PREPARATION OF A DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

DATE: November 24, 2010

TO: Responsible Agencies, Trustee Agencies, and Interested Organizations and Individuals

SUBJECT: Notice of Preparation of a Subsequent Environmental Impact Report for the Final Groundwater Cleanup Strategy for Historical Chromium Discharges from PG&E's Hinkley Compressor Station

LEAD AGENCY: California Regional Water Quality Control Board, Lahontan Region

SEIR CONTACT: Lisa Dernbach, Senior Engineering Geologist
California Regional Water Quality Control Board, Lahontan Region
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150
Phone: (530) 542-5424
E-mail: LDernbach@waterboards.ca.gov

PROJECT TITLE

Final Groundwater Cleanup Strategy for Historical Chromium Discharges from PG&E's Hinkley Compressor Station

BACKGROUND

The California Regional Water Quality Control Board, Lahontan Region (Water Board) is the California Environmental Quality Act (CEQA) Lead Agency for the environmental investigation and chromium groundwater cleanup at the Pacific Gas and Electric Company's (PG&E's) Hinkley Compressor Station. During the 1950s and 60s at the Compressor Station, PG&E discharged chromium-contaminated water, which entered groundwater in the area. In 2008, the Water Board issued Order No. R6V-2008-0014 (General Permit) allowing PG&E to implement in-situ remedial actions and freshwater injection within project area boundaries defined at that time.

Also in 2008, the Water Board issued a Cleanup and Abatement (Order No. R6V-2008-0002) which required PG&E to submit a feasibility study by September 1, 2010 to assess methods to achieve final site cleanup. These objectives are to: 1) achieve plume containment; 2) achieve background conditions for chromium; and 3) restore beneficial uses to the groundwater aquifer. PG&E prepared and submitted to the Board a Feasibility Study (FS) which developed and

analyzed five cleanup alternatives based on their ability to meet the remediation objectives for the site, considering effectiveness, feasibility, time and cost. The FS presents a "no further action" alternative, and four action alternatives:

- Plume Containment
- Plume-wide In-situ Treatment
- Core In-situ Treatment and Beneficial Agricultural Use
- Plume-wide Pump and Treat

These alternatives involve several types of remediation technologies, including:

- Groundwater Extraction and Agricultural Beneficial Reuse
- Clean Water Injection
- Groundwater Extraction, Above Ground Treatment, and Discharge
    - Discharge to Land
    - Direct Injection to Groundwater
- In-situ Treatment

PROJECT DESCRIPTION

The proposed project to be addressed by the Subsequent Environmental Impact Report (SEIR) is expanded core in-situ treatment and agricultural reuse for final cleanup of chromium in groundwater. Additionally, clean water will be injected to provide containment of the chromium in the groundwater within specified boundaries. The Water Board will revise the existing General Permit to incorporate new requirements on discharges. Specifically, the proposed changes to the General Permit will include: 1) the expansion of groundwater extraction and reuse, 2) expansion of the in-situ treatment, and 3) an expansion of the project area. Under the proposal, the expanded project area would allow the implementation of remedial measures over a broader area. Indirect effects related to the revised General Permit include construction and operation of new infrastructure to accommodate the proposed land application, ground water extraction and re-injection, clean water injection, and in-situ measures.

BASIS FOR SUBSEQUENT ENVIRONMENTAL IMPACT REPORT (SEIR)

In 2008, the Water Board adopted General Waste Discharge Requirements for PG&E's currently ongoing groundwater cleanup project. An Initial Study was prepared, and a Resolution approving of the Mitigated Negative Declaration (MND) (State Clearinghouse No. 2008011097) disclosing the effects of the adoption of the General Permit, was adopted by the Water Board in 2008. Groundwater cleanup using limited in-situ remediation and freshwater injection has been ongoing at the site under this existing General Permit. Additionally, agricultural re-use has occurred at the Desert View Dairy under individual waste discharge requirements for PG&E Interim Plume Containment and Hexavalent Chromium Treatment Project (Board Order No. R6V-2004-0034). The Water Board prepared and certified a separate MND in 2004 (certified in Water Board Resolution No. RB6V-2004-0033). Subsequent to that decision, amendments were made to the waste discharge requirements and additional environmental analyses were conducted in 2007 and 2010 to allow for pumping from off-site properties with discharges to the Desert View Dairy as well as the most recent amendment allowing a 50% increased discharge rate to the Desert View Dairy.

As described above, the Water Board expects to revise the existing General Permit to incorporate new requirements on discharges resulting from anticipated expanded remediation activities (land application and in-situ treatment) across a larger area to allow PG&E to implement the final groundwater cleanup approach proposed in the Feasibility Study Although MNDs were adopted by the Water Board for the General Permit and the individual waste discharge requirements for the Desert View Dairy, there may be new potentially significant impacts related to implementing the final groundwater cleanup approach and has therefore determined that it is appropriate to prepare an SEIR. The SEIR analysis will focus on those potential impacts not previously considered in the MNDs adopted for the existing General Permit and individual waste discharge requirements.

ENVIRONMENTAL EFFECTS TO BE EXAMINED IN THE SEIR

The purpose of an SEIR is to examine project alternatives for potentially significant environmental effects not previously considered in the 2004, 2007 and 2008 MNDs and to identify measures that can reduce, avoid, or mitigate potential adverse impacts. Based upon Water Board staff's review of the FS and experience with projects involving groundwater extraction and reuse, the following resources could be significantly affected by the final remediation actions:

- Biological Resources during construction and operation of remediation activities
- Cultural Resources during construction of new infrastructure facilities required to implement the final remediation
- Hydrology and Water Quality during implementation of remediation activities that may affect groundwater quality
- Aesthetics as a result of new infrastructure facilities required to implement the final remediation
- Air Quality during construction of new infrastructure facilities required to implement the final remediation and follow-up maintenance
- Soils during construction of new infrastructure facilities required to implement the final remediation
- Noise during construction of new wells and infrastructure facilities required to implement the final remediation
- Geology from the conversion of hexavalent chromium (Cr6) to trivalent chromium (Cr3), to be left in place

CEQA requires an SEIR to include a discussion of a reasonable range of alternatives, including the "no project" alternative. Specifically, an SEIR must "describe a range of reasonable alternatives to the project or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." Here, the primary objective of the project is final remediation of the contaminated site to background levels of chromium. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives.

The Water Board has selected a consulting firm to assist the Water Board in preparing the SEIR. This firm will work at the Water Board's direction. The SEIR will reflect the independent judgment of the Water Board as lead agency. The FS prepared by PG&E will be independently reviewed by the Water Board and its consultant and used as a source document in preparing the SEIR, along with other information collected by the consultant or provided by the public and the Water Board. The Water Board and its consultant will also review and evaluate comments received on the Notice of Preparation. As described below, the FS is available for review by contacting the Water Board.

At the same time, the Water Board is circulating PG&E's Feasibility Study (FS) for public review and comment pursuant to California Water Code 13307.5. The Water Board will provide a separate notice for this effort.

Following public and agency review and comment on this NOP and the FS, the SEIR will analyze the potential environmental impacts of the proposed project and alternatives.

PROJECT LOCATION

Hinkley, San Bernardino County, California, 92347

The Compressor Station is located in the Mojave Desert approximately 6 miles west of the City of Barstow, California, about one mile north of the Mojave River. Figure 1 shows the project location and vicinity. Figure 2 shows the extent of the chromium contamination in groundwater as of August 2010.

PURPOSE OF THE NOTICE OF PREPARATION

CEQA specifies that a public agency must prepare a SEIR if the proposed project may have a new or substantially more severe significant environmental impact than was previously disclosed in a MND. The Water Board is the CEQA lead agency for the PG&E Hinkley Compressor Station Groundwater Cleanup Project because it will issue a Revised General Permit for the remediation actions. The Water Board has determined that activities to be conducted under the FS and proposed Revised General Permit, such as increased aquifer pumping and discharges of groundwater to land, may have a significant impact on the environment not previously evaluated in the previous MNDs and has therefore decided to prepare an SEIR.

The purpose of this Notice of Preparation (NOP) is to initiate interagency and public dialogue to determine the scope of this SEIR by engaging Responsible Agencies, Trustee Agencies, and interested organizations and individuals in identifying concerns to be addressed in the SEIR. The principal goal of this NOP is to inform agencies and the public about issues related to the project and to solicit recommendations and develop information regarding the scope, focus, and content of the proposed SEIR. The Water Board encourages recipients of this notice to inform others with an interest in or responsibility related to the proposed project that this NOP is available for review.

PROVIDING COMMENTS ON THE NOTICE OF PREPARATION

Responsible Agencies, Trustee Agencies, and interested organizations and individuals are encouraged to submit comments regarding the scope and content of the environmental information to be contained in the draft SEIR for the Water Board's consideration. In formulating your comments, you are encouraged to review PG&E's Feasibility Study (FS) along with the information in this NOP.

To obtain a compact disk of the FS, please contact Amber Wike at 530-542-5404, or awike@waterboards.ca.gov. Compact disks of the FS will also be available at the Hinkley School in Hinkley, California on December 1, 2010. Hard copies of the FS can be viewed at the Hinkley Senior Center, the San Bernardino County Library in Barstow, California, or at the Water Board's Victorville or South Lake Tahoe offices.

Victorville Office
14440 Civic Drive, Suite 200
Victorville, CA 92392
760-241-6583

South Lake Tahoe Office
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150
530-542-5400

A text-only version of the FS is available online at
http://www.waterboards.ca.gov/lahontan/water_issues/projects/pge/docs/pgestudy_txtonly.pdf

Please send written comments to Anne Holden, the Water Board's SEIR Project Manager, at the Water Board's South Lake Tahoe address listed above. You may also email your comments to aholden@waterboards.ca.gov or fax to (530) 544-2271 to the attention of Anne Holden. When submitting comments please identify a contact person to answer any questions regarding your comments.

DEADLINE FOR SUBMITTING COMMENTS

Comments on this NOP must be received no later than 5:00 p.m. on December 31, 2010.

DECEMBER 1, 2010 SCOPING MEETING

On December 1, 2010, beginning at 6:00 pm the Water Board will host a scoping meeting at the Hinkley Elementary School, 37600 Hinkley Road, in Hinkley. The purpose of this meeting is to give the Responsible Agencies, Trustee Agencies, and interested organizations and individuals an opportunity to appear and comment on the scope and content of the draft SEIR. Information will also be presented on PG&E's FS, current boundaries of the chromium plume in groundwater, and information on nitrate pollution in the groundwater in the Hinkley area. This scoping meeting will consist of repeated small group presentations at separate informational stations within the meeting room, including presentations that will provide a project overview, a CEQA process overview and an opportunity for meeting participants to comment orally or in writing on the scope

and content of the SEIR. Written comments will also be accepted at the meeting. A Spanish interpreter will be available at the meeting.

CONTACTS

If you wish to discuss technical details of the groundwater cleanup project, please contact Ms. Lisa Dernbach, Water Board Project Manager, at (530) 542-5424 or ldernbach@waterboards.ca.gov. For media inquiries, please contact the Water Board Public Information Officer, Lauri Kemper at (530) 542-5436 or lkemper@waterboards.ca.gov. For inquiries regarding the SEIR or review process, please contact Anne Holden, Water Board SEIR Project Manager, at (530) 542-5450 or aholden@waterboards.ca.gov.

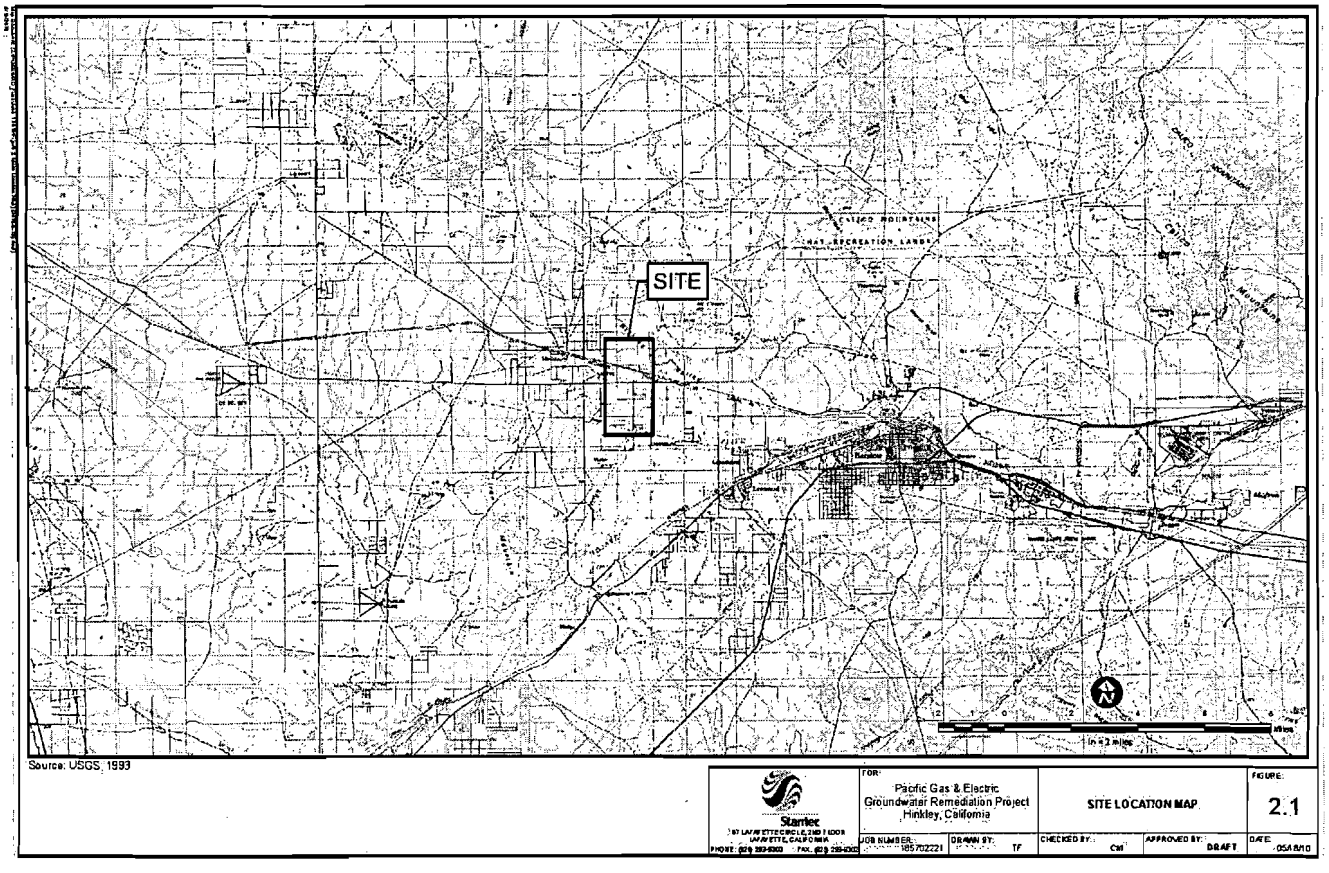
INFORMATION FOR THE DISABLED AND HEARING IMPAIRED

The meeting rooms for the scoping meetings are accessible to people with disabilities. If you have special accommodations or language needs, please contact Water Board's Project Manager Lisa Dernbach at (530) 542-5424. TDD users may dial 711 for the California Relay Service.

FIGURES

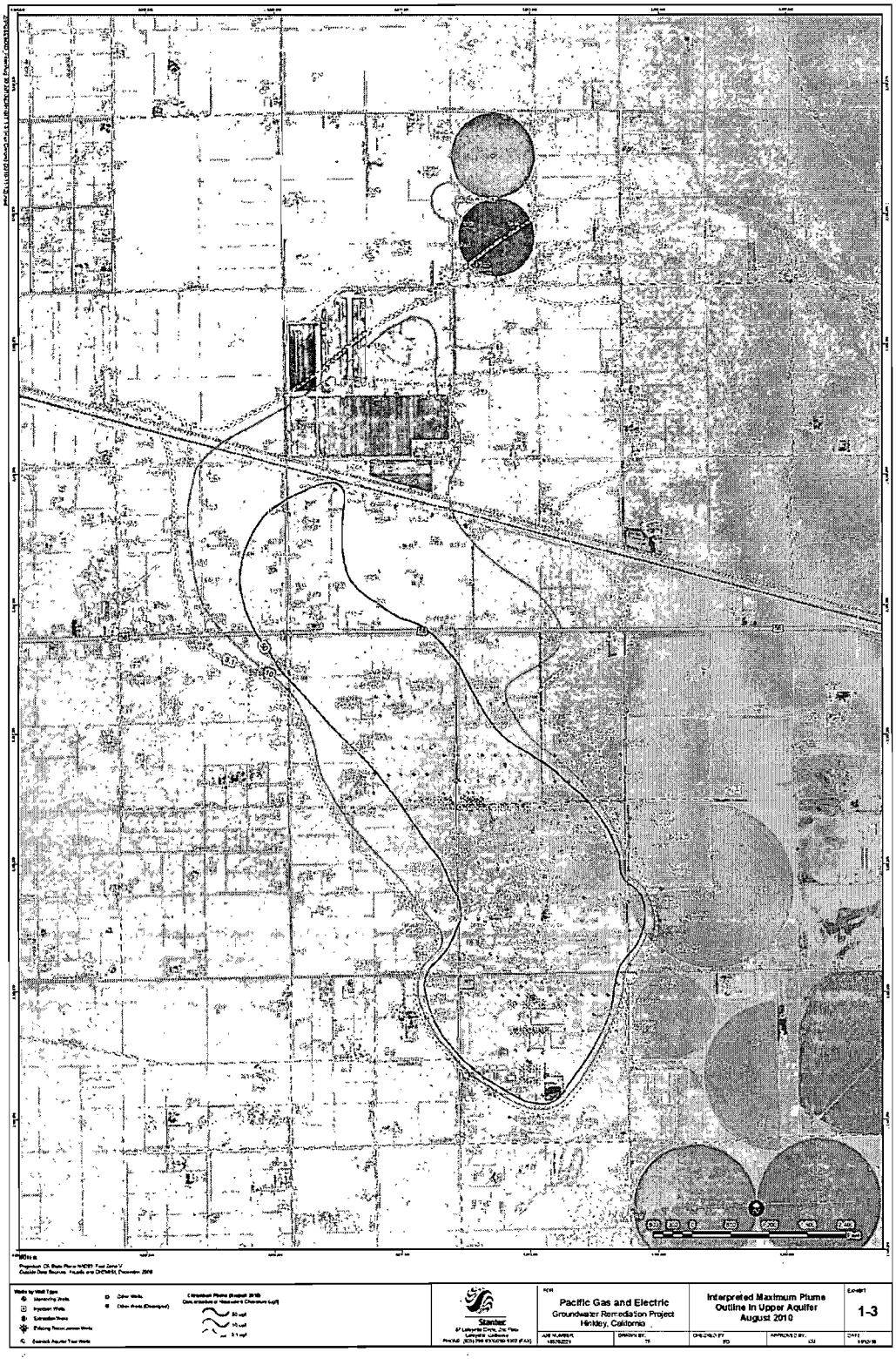
Source: Feasibility Study (Haley and Aldrich, 2010)

Figure 1. Project Location and Vicinity



Source: 3rd Quarter 2010 Groundwater Monitoring Report (CH2MHILL, 2010)

Figure 2. Chromium Plume – August 2010



STATE OF CALIFORNIA — Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

December 9, 2010

Ms. Anne Holden, Environmental Planner

Regional Water Quality Control Board, Region 6 (Lahontan)
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Re: SCH#2008011097 CEQA Notice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the **General Permit for Site-wide Groundwater Remediation Project**; located in the Mojave Desert; San Bernardino County, California

Dear Ms. Hodden:

The Native American Heritage Commission (NAHC) is the state 'trustee agency' pursuant to Public Resources Code §21070 for the protection and preservation of California's Native American Cultural Resources. (Also see *Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3rd 604).* The California Environmental Quality Act (CEQA - CA Public Resources Code §21000-21177, amendment effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance. The lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. State law also addresses Native American Religious Expression in Public Resources Code §5097.9.

The Native American Heritage Commission did perform a Sacred Lands File (SLF) search in the NAHC SLF Inventory, established by the Legislature pursuant to Public Resources Code §5097.94(a) and Native American Cultural Resources **were NOT identified** within one-half mile of several of the Area of Potential Effect (APE). However, there are Native American cultural resources in close proximity to the APE. Also, it is important to understand that the absence of archaeological, Native American cultural resources in an area does not indicate that they are not present, or will be present once ground-breaking activity begins. The NAHC recommends early consultation with Native American tribes in your area as the best way to avoid unanticipated discoveries once a project is underway and to learn of any sensitive cultural areas. Enclosed are the names of the culturally affiliated tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). A Native American Tribe or Tribal Elder may be the only source of information about a cultural resource.. Also, the NAHC recommends that a Native American Monitor or Native American culturally knowledgeable person be employed whenever a professional

archaeologist is employed during the 'Initial Study' and in other phases of the environmental planning processes.

Furthermore the NAHC recommends that you contact the California Historic Resources Information System (CHRIS) of the Office of Historic Preservation (OHP), for information on recorded archaeological data. This information is available at the OHP Office in Sacramento (916) 445-7000.

Consultation with tribes and interested Native American tribes and interested Native American individuals, as consulting parties, on the attached NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f])*et seq.),* 36 CFR Part 800.3, .4 & .5, the President's Council on Environmental Quality (CSQ; 42 U.S.C. 4371 *et seq.*) and NAGPRA (25 U.S.C. 3001-3013), as appropriate. The 1992 *Secretary of the Interior's Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including *cultural landscapes.* Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e).

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery'. Discussion of these should be included in your environmental documents, as appropriate.

The authority for the SLF record search of the NAHC Sacred Lands Inventory, established by the California Legislature, is California Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10). The results of the SLF search are confidential. However, Native Americans on the attached contact list are not prohibited from and may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens. Although tribal consultation under the California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177) is 'advisory' rather than mandated, the NAHC does request 'lead agencies' to work with tribes and interested Native American individuals as 'consulting parties,' on the list provided by the NAHC in order that cultural resources will be protected. However, the 2006 SB 1059 the state enabling legislation to the Federal Energy Policy Act of 2005, does mandate tribal consultation for the 'electric transmission corridors. This

is codified in the California Public Resources Code, Chapter 4.3, and §25330 to Division 15, requires consultation with California Native American tribes, and identifies both federally recognized and non-federally recognized on a list maintained by the NAHC

Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the California Code of Regulations (CEQA Guidelines) mandate procedures to be followed, including that construction or excavation be stopped in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery until the county coroner or medical examiner can determine whether the remains are those of a Native American. . Note that §7052 of the Health & Safety Code states that disturbance of Native American cemeteries is a felony.

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Attachment: List of Culturally Affiliated Native American Contacts

Cc: State Clearinghouse

Native American Contacts
San Bernardino County
December 9, 2010

Lone Pine Paiute-Shoshone Reservation
Melvin R. Joseph, Chairperson
P.O. Box 747 — Paiute
Lone Pine , CA 93545 — Shoshone
admin@lppsr.org
(760) 876-1034
(760) 876-8302 Fax

Fort Mojave Indian Tribe
Tim Williams, Chairperson
500 Merriman Ave — Mojave
Needles , CA 92363
(760) 629-4591
(760) 629-5767 Fax

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, Chairman
P.O. Box 391670 — Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838 — Fernandeño
Newhall , CA 91322 — Tataviam
tsen2u@hotmail.com — Serrano
(661) 753-9833 Office — Vanyume
(760) 885-0955 Cell — Kitanemuk
(760) 949-1604 Fax

San Manuel Band of Mission Indians
James Ramos, Chairperson
26569 Community Center Drive — Serrano
Highland , CA 92346
(909) 864-8933
(909) 864-3724 - FAX
(909) 864-3370 Fax

AhaMaKav Cultural Society, Fort Mojave Indian
Linda Otero, Director
P.O. Box 5990 — Mojave
Mohave Valley AZ 86440
(928) 768-4475
LindaOtero@fortmojave.com
(928) 768-7996 Fax

Chemehuevi Reservation
Charles Wood, Chairperson
P.O. Box 1976 — Chemehuevi
Chemehuevi Valley CA 92363
chair1cit@yahoo.com
(760) 858-4301
(760) 858-5400 Fax

Morongo Band of Mission Indians
Michael Contreras, Cultural Heritage Prog.
12700 Pumarra Road — Cahuilla
Banning , CA 92220 — Serrano
(951) 201-1866 - cell
mcontreras@morongo-nsn.gov
(951) 922-0105 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and federal NAGPRA. And 36 CFR Part 800.

This list is only applicable for contacting local Native Americans for consultation purposes with regard to cultural resources impact by the proposed SCH#2008011097; CEQA NOtice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the General Permit for Site-wide Groundwater Remediation Project; located in the Hinkley Area of the Mojave Desert; San Bernardino County, California.

Native American Contacts
San Bernardino County
December 9, 2010

San Manuel Band of Mission Indians
Ann Brierty, Policy/Cultural Resources Departmen
26569 Community Center. Drive Serrano
Highland , CA 92346
(909) 864-8933, Ext 3250
abrierty@sanmanuel-nsn.gov
(909) 862-5152 Fax

Fort Mojave Indian Tribe
Nora McDowell, Cultural Resources Coordinator
500 Merriman Ave Mojave
Needles , CA 92363
g.goforth@fortmojave.com
(760) 629-4591
(760) 629-5767 Fax

Serrano Nation of Indians
Goldie Walker
P.O. Box 343 Serrano
Patton , CA 92369

(909) 862-9883

Kern Valley Indian Council
Robert Robinson, Co-Chairperson
P.O. Box 401 Tubatulabal
Weldon , CA 93283 Kawaiisu
brobinson@iwvisp.com Koso
(760) 378-4575 (Home) Yokuts
(760) 549-2131 (Work)

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and federal NAGPRA. And 36 CFR Part 800.

This list is only applicable for contacting local Native Americans for consultation purposes with regard to cultural resources impact by the proposed SCH#2008011097; CEQA NOtice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the General Permit for Site-wide Groundwater Remediation Project; located in the Hinkley Area of the Mojave Desert; San Bernardino County, California.

Department of Toxic Substances Control

Linda S. Adams
Acting Secretary for
Environmental Protection

Maziar Movassaghi
Acting Director
5796 Corporate Avenue
Cypress, California 90630

Edmund G. Brown Jr.
Governor

January 5, 2011

Ms. Anne Holden
California Regional Water Quality Control Board, Lahontan Region
2501 Lake Tahoe Boulevard
South lake Tahoe, California 96150

NOTICE OF AVAILABILITY OF THE DRAFT ENVIRONMENTAL IMPACT REPORT (EIR) FOR PGE HINKLEY COMPRESSOR STATION

Dear Ms. Holden:

The Department of Toxic Substances Control (DTSC) has received your submitted Notice of Preparation of a draft Environmental Impact Report for the above-mentioned project. The following project description is stated in your document: "The proposed project to be addressed by the Subsequent Environmental Impact Report (SEIR) is expanded core in-situ treatment and agricultural reuse for final cleanup of chromium in groundwater. Additionally, clean water will be injected to provide containment of the chromium in the groundwater within specified boundaries. The Water Board will revise the existing General Permit to incorporate new requirements on discharges. Specifically, the proposed changes to the General Permit will include: 1) the expansion of groundwater extraction and reuse, 2) expansion of the in-situ treatment, and 3) an expansion of the project area. Under the proposal, the expanded project area would allow the implementation of remedial measures over a broader area. Indirect effects related to the revised General Permit include construction and operation of new infrastructure to accommodate the proposed land application, ground water extraction and re-injection, clean water injection, and in-situ measures".

Based on the review of the submitted document DTSC has the following comments:

1) DTSC recommends that the Water Board consider citing specific cleanup criteria to be used and also evaluate other constituents from the release besides hexavalent chromium. Please also take into consideration the impending change in the Public Health Goal by OEHHA for Cr in drinking water during remediation. Please see the following link: http://www.oehha.ca.gov/water/phg/pdf/123110Chrom6.pdf

2) Human health and the environment of sensitive receptors should be protected during any construction or demolition activities. If necessary, a health risk assessment overseen and approved by the appropriate government agency should be conducted by a qualified health risk assessor to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.

3) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, the facility should also obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942. Certain hazardous waste treatment processes or hazardous materials, handling, storage or uses may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.

If you have any questions regarding this letter, please contact me at ashami@dtsc.ca.gov, or by phone at (714) 484-5472.

Sincerely,

Al Shami
Project Manager
Brownfields and Environmental Restoration Program

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov.

CEQA Tracking Center
Department of Toxic Substances Control
Office of Environmental Planning and Analysis
P.O. Box 806
Sacramento, California 95812
ADelacr1@dtsc.ca.gov

CEQA # 3090

DEPARTMENT OF TRANSPORTATION
DISTRICT 8
PLANNING
464 WEST 4th STREET, 6th Floor MS 725
SAN BERNARDINO, CA 92401-1400
PHONE (909) 383-4557
FAX (909) 383-5936
TTY (909) 383-6300

Flex your power!
Be energy efficient!

January 10, 2011

Anne Holden
Regional Water Quality Control Board, Region 6 (Lahontan)
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Notice of Preparation (NOP) for the General Permit for Site-wide Groundwater Remediation Project Draft Environmental Impact Report (EIR).

Dear Ms. Holden:

The California Department of Transportation (Department) received the Notice of Preparation (NOP), for the General Permit for Site-wide Groundwater Remediation Project draft Environmental Impact Report (EIR).

The proposed changes to the General Permit includes the expansion of groundwater extraction and reuse, expansion of the in-situ treatment and an expansion of the project area to allow remedial measures over a larger area. The project is located in the County of San Bernardino, Community Boulevard/Fariview Road, Hinkley, CA. The proposed project extends north and south of State Highway 58.

Caltrans has the discretionary authority to issue special permits for the movement of vehicles/loads exceeding statutory limitations on the size, weight, and loading of vehicles contained in Division 15 of the California Vehicle Code. Requests for such special permits require the completion of, and application for a Transportation Permit.

Issuance of a Caltrans Encroachment Permit will be required prior to any construction within the RW and shall be in compliance to all current design standards, applicable policies, and construction practices. Please reference the Encroachment Permits Manual at http://www.dot.ca.gov/hq/traffops/developserv/permits/ Chapter 600 Utility Permits for applicable requirements.

In addition we recommend referencing the Right of Way Manual Chapter 13 http://www.dot.ca.gov/hq/row/rowman/manual/index.htm and the Project Development Procedure Manual http://dot.ca.gov/hq/oppd/pdpm/pdpmn.htm Chapter 17.

These comments are based upon a review of the materials provided for our evaluation. Other comments detailing possible impacts to State facilities may follow as the project progresses. If you have any questions regarding this letter, please contact me at (909) 383-4557 for assistance.

Sincerely,

DANIEL KOPULSKY
Office Chief
Community Planning, IGR/CEQA Review

PG & E Hinkley Groundwater Cleanup Strategy for Historical Chromium Discharges

Subsequent EIR

Comment Form

****

Optional Information:

Commenter Name: 37775 Hinkley Rd

Date: 12/1/10

Agency/Affiliation (if any):

Address/email:

****

I would Like you to consider?

1) Buying out homes in hinkley hurts the community.

2) The time frame for clean up (100 + 200) years is outrageous.

3) The number of things you testing for is very minimal, More items need to be considered when testing water. (esspecialy for the School.

Return to: Lahontan Regional Water Quality Control Board
Attention: Anne Holden
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150
Fax: 530-544-2271

PG & E Hinkley Groundwater Cleanup Strategy for Historical Chromium Discharges

Subsequent EIR

Comment Form

****

Optional Information:

Commenter Name: Amber Powers/Boca Date: 12-1-10

Agency/Affiliation (if any):

Address/email: 37440 Summerset Rd 760-514-1547

****

What are all the effects of drinking, cooking, and bathing in this water?

Return to: Lahontan Regional Water Quality Control Board
Attention: Anne Holden
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150
Fax: 530-544-2271

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

I am a former resident of Hinkley and I would like have the updates on the water issues. I Lived in 37445 Summerset RD Hinkley, CA 92347. I now live in 29701 1ST AVE Barstow, CA 92311. thank You. I am having Health issues. Lots of head akes stomach akes and lost of memorie.

Name CARLOTA QUIÑONEZ E-mail

Address 29701 1ST AVE Barstow, CA. 92311 Phone No. (760) 256-8475 (760) 784-7657

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

There should be more names of streets so it is easier ~~and accurate~~ to locate people's property. That way we can really see how this affects us.

Name Elizabeth Hunard E-mail hinkleybetty@hotmail.com

Address 35490 Riverview Dr. Phone No. 760-953-7682

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

I FEEL THAT THE INSTALLATION OF A WATER DISTRIBUTION SYSTEM WOULD BE A WIN WIN SITUATION. IT WOULD PROVIDE CLEAN WATER TO THE COMMUNITY AND PROVIDE JOBS. IT WOULD ALSO HELP TO RECOVER PROPERTY VALUES AND MAKE PG&E LOOK GOOD

Name DAVE CHENEY E-mail geaman-1@YAHOO

Address 22230 HIGHCREST Phone No. 760 900 5334

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

Home Owner North of Hinkley School. Possible TDS problem.

Name Kevin Neil Clark E-mail

Address 39073 Hinkley Rd. Phone No. 760-253-3807

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

My name is Moises avalos I am a former resident of Hinkley in ES Highway 58 [redacted]. I am now having problem's with my family with their health issues. My doughers have lots of stomach akes head akes and often feel diss. I lived there in the contaminated area for at least 7 or 8 years. I found out that the water was contaminated after moving. I now live in Barstow, CA. 92311 I can prove I lived there.

Name Moises Avalos E-mail VictorCorral73@Yahoo.Com

Address 29281 Arrowhead. Ave. Barstow CA. 92311 Phone No. (760) 590-0336 or (760) 590-0338

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

I am Servando Piña I would like to have the updates on the water issues. I am a former resident Hinkley 36507 Sommerset Hinkley, CA 92347. I and my famalt are having Health issues. So is my famaly often have head akes stomach akes and lost of memoric and eye vision.

Name Servando Piña E-mail

Address 25541 Hesperia Rd Barstow CA. 92311 Phone No. (760) 694-3687 (760) 490-8390

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

When will it be done?
Give them a definite time limit.
Why property values are inflated?
Go buyout by PG+E?

Name Bradley Gormley E-mail _____

Address 38005 Yucca Rd Phone No. (760) 954-1389

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

General Comments heard at mtg.

1) PG+E doesn't care about lower aquifer

2) PG+E needs to provide water for animals + plants, swimming, etc.

Name _____ E-mail _____

Address _____ Phone No. _____

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

Lahontan Regional Water Quality Control Board

PG&E's Hinkley Chromium Remediation Project

Public Information Meeting December 1, 2010

Comment Card

- C-u to Ø if BG is ~~Ø~~

- 34-01 dep well
  .31 Cr^{+6} 5/10
  .54 8/10

- dw standard 50 ppb

Name Joel [illegible] E-mail _____

Address _____ Phone No. _____

Comments will also be accepted by E-mail. Please send messages to LDernbach@waterboards.ca.gov

PG & E Hinkley Groundwater Cleanup Strategy for Historical Chromium Discharges
Subsequent EIR
Comment Form

****

Optional Information:

Date: Dec 5, 2010

Commenter Name: Shirley Archer

Agency/Affiliation (if any):

Address/email:

****

I went to the community meeting Dec 4 at Hinkley School and didn't learn anything. It was very confusing. I asked some questions and no one could answer them or not to where the average person could understand.

This is what I want answers to:

(1) Is it safe to Bath and Shower with the water?

(2) Wash your clothes and dishes in?

(3) Breath the air coming out of our Evaporative coolers?

(4) The watering of Lawn and trees, being on the lawn and breathing of dust from mowing the lawn?

Return to: Lahontan Regional Water Quality Control Board
Attention: Anne Holden
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150
Fax: 530-544-2271

MICHAEL R. WENDLBERGER
ATTORNEY AT LAW

MICHAEL R. WENDLBERGER
1670 SOUTH AMPHLETT BLVD., SUITE 214
SAN MATEO, CA 94402

TELEPHONE: (650) 378-2404
FACSIMILE: (650) 378-2405

VIA MAIL

December 29, 2010

California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

Dear California Regional Water Control Board:

My name is Michael Wendlberger, I am writing this letter on behalf of my client Eleanor Ann Wendlberger in response to PG&E's cleanup proposal relating to the onsite Cleanup of Hexavalent chromium.

My client believes that the only option that should be considered is that of complete cleanup. PG&E should not be in charge of any further studies. Rather the studies should be performed by an outside agency and later billed out to PG&E. PG&E should only be used as a financial source for the cleanup. Having PG&E oversee and create studies for what they are ultimately responsible for is a clear conflict of interest. Their interest in limiting costs and the interest of public health.

This conflict of interest is one reason PG&E has proposed the option currently on the table. Under the proposed cleanup it would take 220 years for the average background to reach normal numbers. PG&E failed in the past to properly control this contaminated area. PG&E must not be allowed to do this again. They must not be allowed to do the minimum. Public safety should be the only concern, regarless of cost. Let us not condemn the public so that PG&E can keep profit up.

PG&E must do the right thing, and the only way for this to occur is if they are forced to pay for a complete and total cleanup of all contaminates in the area.

Again, the only cleanup proposal that should be considered is one that includes complete removal of all contaminants as quickly as possible. If you have any questions or would like to discuss this matter with myself or my client please contact my office at your convenience. Thank you.

Sincerely,

Michael Wendlberger, Esq.
Attorney for Eleanor Wendlberger

From: Lisa Dernbach
To: Anne Holden
Date: 1/3/2011 9:57 AM
Subject: Public Comment on Feasibility Study

The following comments were left on a phone message to me from Naz Awad of Dixie Road in Hinkley:

1) PG&E's proposed cleanup time of 150 years is excessive and unreasoanble for the public to endure contamination for that long.

2) PG&E needs to put more effort into their proposed and present remedition activities especially since their current efforts can't even stop the plume from migrating.

3) It time to fine them big.

Lisa

December 29, 2010

Anne Holden

Cc: Lisa Dernbach

Project Title: Final Groundwater Cleanup Strategy for Historical Chromium Discharges from Pacific Gas & Electric Company's Hinkley Compressor Station.

Public Comment Response to Feasibility Study prepared by P G & E

My name is Jeanette Aguayo and I reside at 22619 Thompson Rd., Hinkley, California. I have been a resident on this property for more than twenty-five years. I am making this comment on P G & E's feasibility study as an interested individual. I have no background in hydrology or geology, but I do have a lot of experience in being a neighbor of P G & E and the changes that the clean-up of this chromium plume can bring to your life.

I have read the entire study with the exception of the referenced appendices, which I have requested and plan to review in the future.

The first issue I would like to address is the position of P G & E regarding the average background level and the maximum background level. I have never understood how these levels were established and my hope is by reviewing some of the information in appendix A I will gain some of that understanding. After reading the comments by P G & E regarding the accomplishment of remediation to average background level not being technically or economically feasible, I wonder if the information in the study is even relevant. I was also shocked that P G & E FS proposed in section 5.1 that the maximum background be increased to 3.55 pg/L for Cr (VI). It is clear that when the MCL is set for Cr (VI) the level will be much lower than what is recognized now as maximum background. The FS also makes several references to the MCL for Cr (T) and cleanup to under that level will meet water quality standards as defined by the Basin Plan. I feel it is essential to establish the much referenced "target level for cleanup" more clearly and concisely for the entire plume. Those levels should not be subject to any misinterpretation.

I would like to make comment on the issue of beneficial use. P G & E describes the cleanup should be to a level of beneficial use for agricultural purposes. This is my home and I have hundreds of neighbors who would also take exception to that. We have a right to have our water cleaned up to drinking water standards. Regardless of who may own the contaminated properties the LRWQCB should oversee the remediation of the final cleanup to that drinking water standard regardless of the economic feasibility described by P G & E's FS.

I would also like to make a comment on the recommendation of Alternative 4 as the alternative selection. I have personally seen the advancement of this plume over the last twenty-three years and cannot conceive that the objective of containment or remediation can be achieved by pursuing more of

the same methods that have already been a failure. I can see that this is the most "economically feasible" for P G & E, but I do not think that is the most effective method for the most complete cleanup possible. Clearly only alternative 5 is the most viable option for complete cleanup. I realize that this option also carries the most impact as far as the esthetic value and the future of the Hinkley Valley and its residents.

I have lived on the edge of this plume for many years and have only recently come to realize the magnitude of the containment and remediation of the Chromium Plume discharged decades ago by P G & E. The final cleanup plan will come at a huge cost to the Hinkley Valley, the residents and our environment. The price we will all pay will have nothing to do with being "economically feasible".

DEC 17, 2010

MARK ORR
POBox 87
36714 Hidden River Rd.
Hinkley CA 92347
1-760-253-5304

ATTN: ALL MEMBERS OF THE BOARD
State of California California Regional Water Quality Control Board Lahontan Region
2501 Lake Tahoe Boulevard, South Lake Tahoe,Ca 96150

RE: Request to California Regional Water Quality Control Board, Lahontan Region.
→ This letter sent as comment to Remediation Project.

Concerning the expansion of the chromium 6 plume in Hinkley, California. According to information provided by CRWQCB Lahontan Region, by my understanding, the chromium 6 plume has continued expanding, especially to the North and North East directions.

If Hinkley Chromium 6 clean-up efforts are to maintain or regain water quality, quantity and/or avvailibility for the people of this region of California, then I regard the clean-up efforts as a failure. If the plume is still expanding, or if chromium 6 is migrating away from the plume, and Hinkley homes and properties are lost due to this expansion, then the primary reason for the clean-up is failed.

I REQUEST those originally responsible for the Chromium 6 plume, PG&E, be required to bring in clean water in large scale (trucked, pipelined, 5000 to 10,000 gallon or larger tanked, and/or alternated water wells etc.) at PG&E expense. This would be a just and reasonable course of action for central and North Hinkley, especially regarding any business or institution, including Hinkley School.

DEC 17, 2010 MARK ORR / CHROMIUM PLUME HINKLEY
Comment to project

Yet the physical problem still remains. I myself do not side with those purely wanting a monetary solution. The Chromium 6 plume and related contamination is a physical problem that needs to be fixed. Purchasing homes and properties and having them leave the community does not solve the water quality problem. This problem is below ground, therefore people should not have to leave if water is provided. It is my opinion the usual Ramp-Down restrictions do not and/or should not exist due to the special circumstances of this situation in Hinkley. I REQUEST PG&E pay and/or provide water to offset the ramp-down water loss concerns due to their providing water to Hinkley, California.

If the physical problems in Hinkley cannot be fixed, or will take 150 years or more to solve as recent estimates have stated, then providing a means for the community of Hinkley, California, to survive would be the next logical and just course of action, rather than continue allowing the community of Hinkley to be erased from the map due to clean-up failure and/or enormous duration of time for completed clean-up.

It is my opinion if this contamination occured in the City of San Bernardino itself a completely different clean-up strategy and attitude of concern would have resulted.

MARK ORR

HINKLEY

From: Lisa Dernbach
To: Holden, Anne
Date: 1/4/2011 9:07 AM
Subject: More Public Comments on the FS

Anne,

I was contacted yesterday by Charlene Bradley of Pueblo Rd in Hinkley who wanted me to convey the following FS comments:

1) PG&E's proposed cleanup time is outrageous, especially considering that multiple technologies exist to cleanup Cr6 from the environment.

2) Wants cleanup to be completed in 10 years so she can sell her house at normal market values without the sigma of it being in a contaminated town.

Lisa

From: jeanette aguayo <iloandollars@msn.com>
To: <aholden@waterboards.ca.gov>
CC: <ldernbach@waterboards.ca.gov>
Date: 12/29/2010 9:33 PM
Subject: Final Groundwater Cleanup Strategy for Historical Chromium Discharges from Pacific Gas & Electric
Attachments: Feasibility Study Comment.docx

Attached please find my public comment response.
Respectfully,
Jeanette Aguayo

110109 Lahontan comments

One of my main concerns is the lack of true desire or ability of PGE to clean up their contamination. Their main goal seems to be to limit their costs and legal obligations and to erase Hinkley and it's people from the map and history. They are only concerned with the people who might later take legal actions against them. Their actions have affected all residents in the area, not just those they try to silence with payoffs. PGE has had substantial negative affects on the entire area and yet is only concerned with those who have the loudest voices, most legal standing and those organized enough to have decent legal representation. The rest of the community is told that they will just have to suffer the consequences of PGE's contamination. Dilution is not a solution.

PGE stating that 3.1 ppb Chrome-6 is our background level, is irresponsible and bad science. PGE will tell us that 3.1 ppb in our water is natural. But if our wells have shown non-detect (ND) for Chrome-6 in the past and then start showing contamination, PGE says it is natural and not their responsibility. If wells are ND, then any increase in Chrome-6 is due to PGE efforts to dilute their contamination. There may very well be some natural sources of Chrome locally, but for PGE to limit their clean up due to this is unfair to the locals and gives PGE a cheaper resolution to their contamination. This will be an environmental justice issue if PGE is allowed to take our ND wells and contaminate them up to 3.1ppb without any repercussions.

PGE and Lahontan Staff have stated that Chrome-6 will change to Chrome-3 and then be stable and safe forever. Why no explanation of the issue in Davis CA., where Chrome-3 changed to Chrome-6 when mixed with Sludge and manganese. Manganese is naturally occurring in our area and remnants of the chemical can be found leaching from the old Hinkley landfill. If this is a possibility, then why is Lahontan allowing this science be molded by PGE for their economic benefit?

http://www.sacbee.com/2010/02/06/2517361/uc-davis-may-have-solved-mystery.html
"Recent research by Stanford University scientists has shown that chromium-3 can be converted into the toxic chromium-6 variety when it mixes with nutrients such as sewage and with naturally occurring manganese in the soil."

If this is true then Lahontan's is allowing the possibility of more Chrome-6 be produced by the actions of PGE.

The possibility of other possible contaminants being pushed around and dislodged by PGE actions or remediation should be expected and anticipated. As PGE pushes millions of gallons of water around Hinkley, they must be responsible for any historical or other contaminants their actions dislodge or transport. If PGE's work near the Desert View Dairy (DVD) increases the nitrates in that area, then PGE is responsible for those nitrates. Same with other contaminants like arsenic, manganese, percolates, or any other substances that start to move due to PGE actions. Hinkley has many sources of historical contamination including mining, railroad, military and farming. Hinkley School is of particular concern in this regard. If the School District only tests the State minimum, and

PGE only tests for Chrome, then the kids health and safety is at risk and PGE is potentially responsible. If PGE only tests for Chrome, and their actions cause the release of any other contaminants, those contaminants will be missed by any testing even though it was caused by PGE's actions. PGE or someone needs to do a full spectrum water test at regular intervals. PGE tests most local wells when asked, but only tests for Chrome, giving residents a false sense of the safety of their water. PGE should be doing full spectrum tests and help residents understand and take measures to protect their families from all contamination. PGE sees this as adding to their liability but I see as being a good neighbor who cares about what's going on within the community. PGE should produce a source of water at the school site that is clean. Bottled water is not the answer.

I asked for and was told PGE would give us data on the tracers and other substances they put into our water. Yet years later I have never received any info. I must assume they are not using tracers then, because if they are adding things to the water that could end up in a drinking fountain on the school site, then there is a major reason of concern for parents and students at the School. I know PGE asked for and was given permission to dump more persistent tracers into the aquifer, but they were also told to supply me with info on what tracer residuals were detected down stream. If PGE is adding the enhanced tracers and denying us the info, then what other info are they denying us? We should know what is being put in our water.

PGE needs to produce one source in Hinkley with certified clean water to prove that they have the desire and ability really clean up their mess. I question their desire and ability to be truly responsible for their past actions. I feel PGE should be removed from the cleanup and an independent company brought in to clean up their mess at PGE's expense. How long will Lahontan allow PGE to muddle through this "cleanup" which closey resembles a slow measured extermination of the people and community of Hinkley from history and off the map. If Lahontan Staff and Board Members lived here and had their families threatened and humiliated by PGE, then maybe they would take more actions that protect and provide for the residents of Hinkley. The people left here, who through no fault of their own, are now are condemned to live in the Hinkley as contaminated by PGE. How can any residents expect to sell their property after the another negative media cycle seemingly perpetuated and extended by PGE. By PGE's willingness to purchase a "few" more properties, they have made it much more difficult for the rest of the community to sell land in Hinkley.

I would like PGE to place a reverse osmosis filtration building at the Hinkley School site that produces certified clean water for the school with access to the clean water for all the community to use. After all these years and money spent, can PGE produce one source of water that can be called clean. Do they want to? Should Lahontan require PGE to show their ability to do more than just dilute their contamination? If PGE is allowed to just let the plume slowly spread, buying up just the minimum of properties, then the plume becomes the aquifer with a 3.1ppb as an average "normal" contamination in Hinkley? Is this the goal and cheapest solution for PGE?

PGE does not like to be associated with Hinkley, but not as much as the people of Hinkley do not want to be associated with PGE. PGE needs to be a better neighbor. Their reaction during the last negative media cycle shows their true desire to protect themselves and their share holders at the cost of our well-being and long term viability as a small rural community. The idea that a citizens advisory committee would do anything but give PGE a way to stop the communities complaints from getting to the press or Water Board is disingenuous. Maybe Mr. Pruett or other "real" PGE decision makers can come to Hinkley and be a member of this Advisory Board, as they say they care about us and know what's best for us.

Article for the legal record:

"UC Davis may have solved mystery of chemical contamination

Share

By Matt Weiser
mweiser@sacbee.com
Published: Saturday, Feb. 6, 2010 - 12:00 am | Page 1B

A dangerous chemical on the site of a former animal-testing laboratory at UC Davis may not have come from experiments there, but rather from a chemical reaction underground in the years since.

For 30 years starting in 1958, the Laboratory for Energy-Related Health Research was, for some, a place of discovery. For others it was a source of nightmares.

The lab conducted Cold War-inspired research for the U.S. Department of Energy, including exposing beagles to lethal radiation to judge how humans might survive.

Waste from those experiments, including hundreds of radioactive dog carcasses, was dumped on-site in crudely built landfills. The 15-acre location south of Interstate 80 was declared a federal Superfund site in 1994, a category reserved for the nation's most toxic industrial facilities.

Yet the presence of cancer-causing chromium-6 on the site has been a mystery. There is no evidence the chemical was used at the lab, said Sue Fields, an environmental engineer at the university. And the plume of chromium-6 in groundwater is strangely isolated rather than linked to a particular disposal area.

Now a consultant hired by the university has concluded the carcinogen was probably formed by a chemical interaction underground.

Chromium-3 is a naturally occurring and nontoxic chemical that happens to be common in area soils.

Recent research by Stanford University scientists has shown that chromium-3 can be converted into the toxic chromium-6 variety when it mixes with nutrients such as sewage and with naturally occurring manganese in the soil.

The university once operated a campus sewage treatment plant near the laboratory. And it turns out that sewage sludge from the treatment plant was dumped in landfills on the lab grounds.

The sludge likely migrated into groundwater, feeding a reaction that bred chromium-6.

"I've worked a lot of Superfund sites and have really never seen this pattern of contamination before," said Fields. "We just have this unique area where we have naturally high chromium and manganese in our soil."

Chromium-6 has been detected at the site at levels 10 times greater

than California drinking water standards. But there is no evidence the contaminant has migrated off the site or tainted any active drinking water wells in the area.

University officials plan a pilot project to treat the chromium-6 by converting it back to chromium-3. This will be attempted by injecting calcium polysulfide underground to trigger a reverse reaction.

G. Fred Lee, a consultant in environmental engineering, said success depends on how well the injected chemical can penetrate the soil. Lee works with the Davis South Campus Superfund Oversight Committee, a neighborhood group monitoring the cleanup.

Even if it succeeds, this will not end the cleanup work. The site has a host of other problems, notably a massive plume of hazardous chloroform in groundwater that extends nearly a mile beyond the site.

"They'll be pumping and treating and using other methods for a very long time," said Lee. "For a number of years, they didn't move as fast as they should have. I think they're making pretty good progress now."

UC Davis and the Department of Energy have been working to clean up the lab location for at least 15 years. The energy agency on Jan. 29 released a record of decision on final plans to clean its portion of the site. UC Davis expects to submit its own plan to the U.S. Environmental Protection Agency this fall.

A lingering question is whether the chemical process at work on the UC Davis site could explain other chromium-6 problems in California

groundwater – such as near septic tanks or other landfills.

"If we're right about this, I think that's something that needs to be studied," Fields said.

Read more: http://www.sacbee.com/2010/02/06/2517361/uc-davis-may-have-solved-mystery.html#ixzz1AflPLX1p

From: Lisa Dernbach
To: Anne Holden
Date: 1/10/2011 3:44 PM
Subject: More Feasibility Study Comments

Anne,

Please include the following comments that were sent to me.
Lisa

From Carmela Gonzalez
The specific issues in the Feasibility Study (FS) that I am concerned about (not in order of importance, but in order of the flow of the document) are:

1) The MCL of 50 ug/l for total Cr is being used to meet full beneficial use requirements as defined by the basin plan. I acknowledge that there is no MCL for Cr(VI), but I highlight the absolute ridiculousness of this situation – and fight for an appropriate value to be used since Cr(VI) is a known carcinogen in air and a suspected carcinogen in water. I also want to stress that the state proposed PHG recommends that 20 parts per trillion be adopted by the Water Board as the maximum for long term exposure in drinking water.

2) 220 years to achieve average background values for Cr(VI) is outrageous and unacceptable! Current technologies exist today to cleanup chromium in groundwater in a reasonable timeframe. Since PG&E has already spent 23 years attempting cleanup at the site, it should be required to complete the entire process within 27 more years, for a total of 50 years. This number is reasonable and achievable. Anything less will be considered as lack of environmental justice for Hinkley residents and only profit to PG&E shareholders at our expense.

3) The FS states that plume containment is based on 4 ug/l Cr(VI) and 50 ug/l Cr(T). Rather, per the November 2008 Amended CAO, plume containment needs to be based on the average Board adopted background value of 1.2 ug/l Cr(VI) and maximum background value of 3.1 ug/l Cr(VI). The FS needs to be revised to reflect this fact.

4) The FS does not address the serious matter of significantly increasing Cr(VI) concentrations in groundwater at the Compressor Station. Well SA-MW-05D, shows Cr(VI) increasing from 5,510 ug/l in Jan. 2009 to 9,030 ug/l in Aug. 2010. Such increases imply a source remaining in soil. The FS needs to address this potential source by listing soil sampling information and proposing soil remediation.

5) The FS states there is no regulatory basis or precedent for remediating groundwater to average background versus maximum background. There IS precedence! It is the Water Board's November 2008 Amended CAO, which makes that document the precedence.

6) Major issue – the lower aquifer contamination is not adequately addressed. MW-23C is acknowledged, but it does not appear that any of the alternatives address the lower aquifer. In addition, full delineation of the lateral and vertical extent of the Cr plume in the lower aquifer has not yet been achieved. The FS needs to address full delineation of lower aquifer contamination and propose remediation.

7) The FS unjustly identifies agriculture as the most reasonable long-term beneficial use of the upper aquifer due to TDS and nitrate, and the lower aquifer as the most suitable drinking water supply. Instead, after plume containment, the FS needs to stress that restoration of the drinking water aquifer for domestic and municipal supply is the most important goal of the remedial strategy. Agricultural re-use plays only a minor part in the scheme of things and needs to be downgraded in a revised FS.

8) The FS uses off-site agricultural pumping as the excuse for lack of plume control in the north and says that additional extraction may be needed to enhance plume control. If this was truly the problem, why wasn't the farmer's activities anticipated and removed from the equation sooner instead of waiting for the

plume to migrate?

9) The FS acknowledges that hydraulic capture at the leading edge... "applies stress... that can affect surrounding groundwater supplies." I request contingency plans be developed to address water replacement for residents should such stresses impact domestic wells.

10) The FS statement that "performance monitoring of the DVD LTU"... "indicate that the DVD operation has not resulted in accumulation of chromium in soils" indicates a data gap in the conceptual site model. If chromium is not accumulating in soils and is being removed from groundwater, where is it going? If it is all being absorbed by plants (unlikely, in my opinion) that are harvested and taken off-site, where are the data to support this? I can accept that Cr(VI) is being changed to other, less toxic forms of Cr, such as Cr(III), but that is a different argument than that Cr(T) is apparently just disappearing into thin air. All of this aside, the bottom line is that the statement in the FS contradicts the DVD monitoring reports which indicate detectable Total Cr concentrations in soil increasing with time, reflecting the buildup of Cr(III). Also, a revised FS needs to state what chromium mass will remain after final site cleanup is accomplished.

11) The FS acknowledges that the "DVD LTU operation is expected to result in a net increase in TDS in groundwater." The long-term impacts of this should be considered and, ideally, the LTU operation should be moved away from a major TDS source such as the DVD. If the latter is not proposed, then active remediation of increased TDS concentration must be made a part of PG&E's cleanup strategy.

12) I acknowledge PG&E plans to change irrigation technology at the DVD LTU from subsurface drip to drag-drip configuration in 2010. If this option is selected for final site cleanup, it needs to be monitored to ensure this technology does not pose a threat to nearby residents and to evaluate effectiveness over time.

13) The FS wants to utilize 25% uncertainty in lab sampling to increase the 95% UTL for Cr(VI) from 3.1 ug/l to 3.55 ug/l (to 4.04 ug/l for Cr(T)). This would be factored into the cleanup goal. This argument is not supported by scientific evidence or research and should, therefore, not carry any weight in final site cleanup.

14) Maps provided in the FS all appear to identify the Cr(VI) plume boundary based on 3.1 ug/l (although apparently based on some standardized dataset; not the most recent data). Since the Water Board's cleanup goal is to the average background value of 1.2 Cr(VI), at least one of the maps in the FS should attempt to be drawn to this value.

15) In light of new information showing increased Cr(VI) concentrations from PG&E's waste in domestic wells along Summerset and Thompson Roads, the results of PG&E's 2007 Background Study are now suspect. The undefined plume means that domestic well sampling in the Background Study showing Cr(VI) levels in the northern portion of the Hinkley Valley may have included PG&E's waste all along. I request that the Water Board re-visit the Background Study and have it reviewed by academia using the new data in the north and east end of the plume.

From: Lisa Dernbach
To: Cindy Wise,Lauri Kemper,Mike Plaziak,Patrice Copeland,Jeannette Bashaw,P...
CC: Anne Holden
Date: 1/10/2011 9:07 AM
Subject: Re: PUBLIC COMMENT ON PG&E's PROPOSED FINAL CLEAN-UP OF CHROMIUM 6 POLLUTION AT HE PG&E COMPRESSOR STATION at 35863 FAIRVIEW ROAD, HINKLEY

Mr. Conaway,

Thank you for your comments on PG&E's Aug. 2010 Feasibility Study proposing final site cleanup for hexavalent chromium.

The comments that you submitted in your message, as well as your prior comments from Dec. 1, 2010, will be addressed with other public scoping comments for the Subsequent EIR and the Feasibility Study. We expect the former document to be released to the public in mid-February. And Board staff is planning a public meeting at the Hinkley Elementary School on Jan. 26-27, 7:00 pm, to inform the public of the comments received for the project.

We appreciate your concern in this matter and will continue to keep you apprised as developments occur.

Lisa

Lisa Dernbach, PG, CHG, CEG
Senior Engineering Geologist
Lahontan RWQCB
South Lake Tahoe, CA
(530) 542-5424
(530) 542-5470 fax

>>> Robert Conaway <rdconaway@gmail.com> 01/07/11 3:38 PM >>>
California Regional Water Quality Control Board
2501 Lake Tahoe Blvd, South Lake
Tahoe, California 96150

Phone (530) 542-5400
Fax: (530) 544-2271

Re: COMMENTS ON PG&E FEASIBILITY STUDY for HINKLEY COMPRESSOR STATION-CAUSED PLUME

Dear Ms. Dernback & Lahontan staff:

First, for the record, I want to take issue with the background levels for total chromium and chromium 6 being used by Lahontan and PG&E. The background should be adjusted to nominal levels (1 to 2 ppb).

The two chromium levels currently being accepted by Lahontan and PG&E are being used to hide the extent to which PG&E has impacted the water in the Hinkley Valley area. I have listened to Board members, employees of the Lahontan Board and PG&E smugly refer to 3.1 background levels, that it would be unfair to make PG&E remediate to non detect levels and that it was not necessary.

The assumption has been that surrounding areas have not been impacted by the unlawful chromium release by PG&E. In water tests done by the Lahontan

staff & the County of San Bernardino for example in December of 2008 on my property (See letter dated January 29, 2009 to this writer), the California Laboratory Services reported(their work order #CRL0116; COC# 100574,75) chromium as "ND" (non-detect)–so the question is, how in the world do you & PG&E come up with the inflated background conclusion you two do? Non-detect, means none! So to say there was a background level of chromium 6 all along, is not true. To try and convince people to the West of the plant there is no chromium now in their wells or risk of it in the future based upon the tests saying non detect (arguing from PG&E's characterization, the plume is not moving that way--even though the studies on the Lenwood dump plume, more on that later, describe a plume and groundwater flow to the southwest) is not something that should be ignored in the "background" discussion (and it needs to be addressed fully and fairly with use of 1980's and 1990's data)

Now speaking of wells in the path of the plume (assuming the accuracy of PG&E data), consider the test data on the Mullinax (Mullinex?) property. The Mullinex well is roughly 5/8th of a mile from Sommerset and Dixie. In 1998, the well test data showed .01 miligrams/liter of Chromium 6 and ZERO ("0") total chromium. In a November 4, 2010 test, the well shows 2.4 now of Chromium 6 and 3.7 of total Chromium. To argue a background level of 3.1 for that area is equally wrong.

At the Hinkley school (off Hinkley road on the north side of Highway 58) which is in the path of one acknowledged finger of the moving plume, the reported levels per a presentation made at the Barstow Unified School District Board this past fall by PG&E's roving PR team, put the chromium levels somewhere between 1.2 and 2.0, so if a background level is to be accepted, it should be no more than 2 ppb, which is what the State is looking at for new health standards in any event.

The assumption of there being a background level is a created standard of pollution tolerance and ignores the incremental change in water quality caused by PG&E's moving plume, which is perhaps being pushed by the remediation injection efforts.

*Second, the proposed clean-up thresholds in the PG&E plan, would grandfather in a hazard risk that will be below the proposed new standards & create a lower standard of protection for people in the Hinkley Valley area triggering an environmental justice concern. *

The state Office of Environmental Health Hazard Assessment submitted a draft proposal last week to limit the amount of hexavalent chromium (Chromium 6) to 0.02 parts per billion. PG&E's rush to approve a plan at the current levels being used and the Board's apparent willingness to go with it, will create a lower standard of protection for Hinkley Valley residents than what the rest of the State will have–raising not only a due process issue, but an environmental justice issue.

Why should Hinkley and the surrounding area suffer from a lower water quality standard than the rest of the state's residents where chromium is found in the future?

*Third, the assumption that the methodology used (past & future) will force Chromium 6 into Chromium 3 and it will stay that way appears to be a scientifically challenged opinion. The presence of waste (nitrates, residential, agricultural & commercial septic discharges, manure spreading

in the area) and manganese in the soil (prevalent in the Hinkley Valley area) has been shown to cause Chromium 3 to revert back to Chromium 6 !*

See:

http://www.modbee.com/2010/02/06/1037599/uc-davis-may-have-solved-mystery.html

&

http://www.sacbee.com/topstories/story/2517361.htmlClick+to+view+the+Large+Graphic

The notion of Chromium 3 being unstable and proned to convert back was raised by me over 4 years ago and nothing was done to look at conditions that could create it. UC Davis and EPA have looked at that phenomenon. Maybe PG&E should required to (finally)?

Injecting reductants at the Davis Superfund site where there are nitrates in the soil (which are also coming off PG&E's property in Hinkley), manganese in the soils (also a problem in Hinkley) and sludge (septic releases are the functional equivalent in Hinkley) does not appear to be working (nor is it in the Hinkley Valley apparently).

Fourth, why aren't the approaches used at the UC Davis Superfund or the Valley Wood Preserving Turloch sites being considered in the Feasibility Study (to treat chromium)?

Calcium/sodium polysulfide and sodium metabisulfite chemical reductants have been used to effect the conversion of Cr(VI) to Cr(III) (Rouse, 1997). In situ remedial systems are or have been in operation at chromium contaminated sites in California, Indiana, Maryland, Maine and South Australia, and are planned for Michigan and additional sites in California [cited in EPA in "In Situ Treatment of Soil and Groundwater Contaminated with Chromium: A Technical Resource Guide" (October 2000) at p. 23).

At the Turlock site a sulpher-based reductant (sodium metabisulfite) is being used to remediate Cr(VI) and has reduced the maximum chromium concentrations by more than an order of magnitude [NOTE A 10 yr SUCCESS STORY--WHICH WE WOULD HAVE HAD HAD PG&E & LAHONTAN USED THIS APPROACH].* In situ treatment from February 1998 through October 1999 has resulted in a reduction in plume size and mass of dissolved chromium in groundwater of about 98 percent, according to investigators* (EPA TRG 2000)–if this was used would we be where we are today? Metabisulfate appears quicker and unlike the reductants being used by PG&E, proven.

The peer review typically required before guinea-pigging a population and their water sources is not sufficient for the current PG&E approach (that they just want expanded)--in fact in the* EPA's in "In Situ Treatment of Soil and Groundwater Contaminated with Chromium: A Technical Resource Guide" (October 2000)*, the injection process should have been across the entire front of the plume (more below).

If anything, the injection of treated water (the reductant laden well product) may be pushing the chromium plume outward, or worst yet, the Chromium 3 byproduct, may be reverted back to chromium 6 because of soil same type of soil conditions experienced in Davis, but which the Lahonton Baord and PG&E do not appear to be considering in good faith.

* Fifth, "ion exchange" is the preferred remediation approach in Los Angeles Regional Water Quality Control Board's November 3, 2000 Special

Board meeting (their "Chromium 6 Workshop") -- which the feasibility study does not appear to be considering in good faith. Why not? *

The link to a relevant report is as follows:

[
http://www.swrcb.ca.gov/rwqcb4/water_issues/programs/remediation/chromium/sfv_chr6www_11_13_00.pdf
]

Ion exchange is listed by the Los Angeles Regional Water Control Board as the preferred approach and lists the costs range as being reasonable (less that what PG&E's Eric Johnson says it is in his December 10, 2010 letter).

The Lawrence Livermore National Laboratory (LLNL) clean-up reflects in the "Record of Decision" that ion-exchange was and is the proper approach (by the US Department of Energy that runs the site). In an article by Sally Bahowick, Douglas Dobie and Gene Kumamoto [entitled: ION-EXCHNAGE RESIN FOR REMOVING HEXAVALENT CHROMIUM FROM GROUND WATER AT TREATMENT FACILITY C: DATA ON REMOVAL CAPACITY, REGENERATION EFFICIENCY, AND OPERATION], the ion-exchange program can and did treat chromium from comparable levels found in the Hinkley Valley to below 2 ppb

Apart from the polluter's feasibility study complaining about costs, some comment is made about sulfides in the area interfering with the chromium conversion process. In the LLNL article, it is noted that sulphides & nitrates were also found, but not complained of as reducing system effectiveness. It appears that adjusting the resin used can maximize system effectiveness.

The cost for the system's operation per year $178,000 (including the resin, salt, filters, values, pumps. maintenance & waste disposal) per the LLNL article.

Sixth, soil excavation and chemical fixation techniques is another remediation approach not even being discussed–why?

In the Los Angeles Regional Water Quality Control Board in its November 3, 2000 Special Board meeting (their "Chromium 6 Workshop") report under "Remediation Approach" it states:

"After contamination is delineated in the soil, excavation and chemical fixation techniques are used to remove or immobilize residual contamination. These steps are followed by verification sampling and leachability tests to assure diminished threat to groundwater."

The MW-23C levels must be assumed to be a new release--since those concentrations were nor present. Evacuation of the impact soil AT minimum should be done and the water aggressive treated as the well documents impact to a previously untouched drinking water aquifer.

*Seventh, the EPA in "In Situ Treatment of Soil and Groundwater Contaminated with Chromium: A Technical Resource Guide" (October 2000) states that:

(1) Chromium VI remediation to Chromium III can be undone by the very chemicals in the soil in the Hinkley Valley, and

(2) for the in situ approach to have worked, the entire plume needed to flow through the reactive media (i.e. injected reductants) in order to be effective

*

"While a great deal of progress has been made, a number of needs and issues still need to be addressed before in situ soil and groundwater remediation technologies will be most effective (2000 EPA TRG at p.1).

First, *in order to successfully install a PRB, not only must do a thorough site characterization have been done (which I dispute), the entire plume must flow through and react with the reactive media*–the presence of chromium VI outside the reactive media's presence, shows that requirement has not been met.

Second, another one of the issues ignored–the effect of the manganese compounds in the Hinkley Valley soils. In page 21 of the 2000 EPA Technical Resource Guide (2000 EPA TRG):

"Reduced Cr(III) could re-oxidize to Cr(VI) under certain conditions (presence of manganese dioxide [MnO2]); however, this has not been observed in the field."

Could the new Chromium plume at MW-23C be our first in field observation of the feared phenomenon cited in the 2000 EPA TRG? *

Eighth, is PG&E's injection methodology creating obstructions in the aquifer pore spaces and effectively destroying the Hinkley Valley aquifer, an integral part of the water resource that the State Board is obligated to protect?*

In page 22 of the 2000 EPA TRG, one of the concerns expressed is over potential aquifer pore clogging. While the comment is focused on iron/ferrous-based reductants (and there is high levels of iron in the native soils), the point should not be lost that injecting reductants into metal rich soils, could clog the very mechanism which our water resources need to exist, recharge and last into the future.

Where iron sulfides are present, as is the case in the Hinkley Valley, the in situ approach of PG&E is warned against by the EPA–the approved injection approach could be pushing ferrous metals into the aquifer pores.

Aquifers in the desert are sensitive and fragile despite their depth. Without them water will pool, trap and potentially destabilze the soils above. They are complex and require unobstructed flow of water. Putting reductant laden veggie juice and wood alchohol into iron-sulfate laden soils, is introducing foreign matter that could have catastrophic effects on the entire aquilude/aquitard system. That impact is not being considered. Why not?

* Ninth, the October 14, 2010 cost letter from Eric Johnson is ridiculous & inflated.*

First, reductions using the ion-exchange approach are quicker, so with costs being less that $200,000 per year, the clean up assuming a 10 year protocol and no more than $2,000,000 to build the same facility used by Lawrence Livermore, the cost is roughly $26,000,000 which is cheaper than all the Alternatives using 1.2 ppb assuming a 50 year program. the costs ($122,000,000) are still less than any of the alternatives listed under 1.2 ppb goal or the 3.1 ppb goal.

Second, reductions using Calcium/sodium polysulfide and sodium metabisulfite chemical reductants need to be calculated and what should be note, is that in the Turlock Superfund site, a 98% reduction of chromium 6 was achieved in roughly a decade.

Third, an independent cost analysis at minimum should done.

Letting PG&E massage the numbers to fit their recommended approach is just plain wrong.

* Tenth, to what extent is the Lenwood-Hinkley landfill a contributor to the chromium 6 problem given the predominate flow of the ground water being to the Southwest and the fractured bedrock (and its potentially transporting the type of waste that could cause Chromium 6 to revert back to Chromium 3)?*

Source: BOARD ORDER NO. R6V-2006-0026; WDID NO. 6B360304013

REVISED WASTE DISCHARGE REQUIREMENTS

(a) Under "2. Facility ": The Lenwood-Hinkley Class III Landfill stopped receiving municipal solid waste in July 1997. On the southeast portion of the property the Discharger operated six unlined, Class II surface impoundments, which accepted liquid designated waste (septage and chemical toilet waste). The surface impoundments stopped receiving waste in late 1994 and were cleaned-closed in 1995. There has been a detected release from the Landfill, and the facility is currently in a Corrective Action Program to remediate the release from the facility.

(b) Under "6. Landfill Location": The Landfill is located approximately four miles north of the Community of Hinkley, off of State Highway 58, at 37751 Lenwood Road, San Bernardino County. It is within Section 20, T10N, R2W, San Bernardino Base and Meridian, (SBBM) as shown on Attachment "A," which is made part of this Order.

(c)Under "20. Site Hydrogeology: *Ground water exists in the fractured bedrock beneath the Landfill at depths of approximately 85 to 177 feet below ground surface*. *Groundwater flow directions beneath the site are generally from east to west. *Along the west side of the site, groundwater flow diverges, with a potion of the flow going to the northwest *and a portion of the flow to the southwest*. This results in two separate flow regimes, a northern flow regime and a southern flow regime. Groundwater flows toward the north-northwest with an average hydraulic gradient of 0.003 feet/feet (ft/ft) and with an average gradient of 0.005 ft/ft to the southwest. The average groundwater velocities are 0.04 ft/day for the northern flow regime and 0.07 ft/day for the southern flow regime.

(d) "27. Receiving Waters" *The receiving waters are the ground waters of the Middle Mojave River Ground Water Basin* (Department of Water Resources Hydrologic Unit No. 6-42)."

The surface above the bedrock is where most of the monitoring well activity has been–with the bedrock fractured (and it being at levels varying from 85 to 177 feet below ground surface, is the waste mixing with the groundwater (I have made complaints of the water first developing an odor about 2 ½ years ago). Is the sub bed rock aquifer being impacted by the leaching of septic waste and is it converting Chromium 3 or total Chromium tainted soils back into Chromium 6? Is that a risk even being considered??

* Eleventh, isn't this feasibility study premature in light of the appeal filed November 10, 2010 challenging the Rescission of the Waste Discharge Requirements for PG&E (Board Order R6V-2010-0046 &R6V-2008-0045 &

Refusing to Require PG&E to Do a Supplemental EIR?

*The appeal goes to very authority of the Board to proceed with the process, does it not?

*Twelfth, why hasn't anyone addressed the questions already posed in **OPEN LETTER TO LAHONTON REGIONAL WATER QUALITY BOARD & PG&E handed to Lahontan Staff at the 12/1/2010 "SCOPING" MEETING @ the HINKLEY SCHOOL?*

— Lisa answered in email response

The test of the letter is as follows:

"For too long we in the Hinkley area have gone to meetings, faced well organized teams of professional staff members and selected Lahontan Regional Water Quality District employees, have come with questions and little has been addressed. In fact some on the PG&E team have been condescending, rude and in some instances insulting. We have asked and they have advanced the pollution anxiety rather than properly respond. Lahontan has had to deal with a bully discharger, who is rumored to already be lobbying the Governor-elect to NOT consider appointing people to the PUC.

For the people that do not want to move, are concerned about our water and neighbors that are thinking about moving without knowing all the facts, the following list of concerns, questions and items should be included in the official record of the "Scoping Process":

1. Did the break in the clay at areas near or around Well 23C, create a new release of Chromium 6 into an aquifer previously unaffected? If so, what was/were the cause or causes? Would PG&E be willing to pay for an independent hydrogeological analysis to determine the cause of the lower aquifer contamination? If not, why not?

2. Do we know the direction of flow of the lower aquifer impacted by the chromium penetration through Well 23C?

3. Are there any other chromium leaks into the lower aquifer other than at Well 23C? If so, where? Causes?

4. Has the nitrate plumes in the area been affected/changed as a result of PG&E's injecting treated water as part of its in situ treatment program?

5. Have the background levels of arsenic been changed/affected as a result of PG&E's injecting treated water?

6. Has there been any movement of the known nitrate pollution as a result of PG&E's pumping of treated water?

7. Has there been any movement of the manganese pollution in the area as a result of PG&E's pumping of treated water? If so, when, where and what results were shown?

8. Has PG&E used or stored above or below ground perchlorate acid or related perchlorate byproducts? If so when and for what?

9. Has PG&E had any releases of perchlorate acid or related perchlorate byproducts whether reported or not? If so, when, where?

10. Has there been any other testing of chemical make up and changes in the Hinkley Valley's aquifers' metal content since PG&E's injections started? If so, when, where and what have been the results?

11. How big is the affected area from the break through at 23 C (how big is the plume in the lower aquifer)? To what does that newly contaminated plume connect? Does this feed or connect with the Mojave River?

12. Does any break up of the clay undermine the viability of the pilot-based study which intends to convert Chromium 6 into Chromium 3 by injecting treated water into the aquifer above the clay barrier

13. What are the risks of Chromium 3 to public health and is the in situ program just creating a new and different public health risk?

14. Do we have a full and accurate characterization of the thickness, depth and limits of the clay barrier? If so, where is that data? Would you agree to fund an independent hydrogeological analysis to evaluate if the in situ treatment program, which involves injecting large amount of treated water, should be stopped, curbed and or adjusted recognizing the risks it might create to lower aquifers?

15. Does injecting treated water weaken or thin the clay barrier? Is the thickness and strength of the clay barrier being monitored?

16. Why are background levels being argued as 3.1 ppb when the background data at the school shows the concentration levels at 1.0 to 2.0 ppb? Which level is it?

17. If wells on the West side, near the senior center in Hinkley were reported as Non-Detects, four to five years ago when tested, how can you conclude that 3.1 ppb is background? Is the background level a tad bit arbitrary in view of lower to non-detect levels in areas where PG&E says there is no Chromium 6 plume?

18. Since the Hinkley School is a 6 year school, at 1.0 to 2.0 ppb, what would be the health risks to children regularly drinking the water for six years?

19. Why is not air sparaging being used to clean up the contaminated water? Would it be effective? Wasn't that used to clean the plume at the George Air Force base plume? If more costly, how much so?

20. Why isn't the water being pumped up and treated by reverse osmosis to pull the Chromium 6 out and re-inject the clean water? If its costs that have excluded that approach, what is the cost?

21. Why was excavation, transport and treating of the soil not considered as a clean-up approach? If more costly, how much so?

22. Since part of the PG&E strategy is to buy property in the plume or in its path to facilitate its clean-up, please state the reasons that PG&E requires the settlements to be secret.

23. Has PG&E disclosed to its potential sellers, that by making the

settlement "secret", the settling property owner may be creating a taxable event, effectively reducing their net 30-40%, depending on their income, age, etc?

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24. Has PG&E disclosed to its potential sellers, that income sensitive entitlements such Medi-Cal and SSI may be lost by taking the settlement as opposed to having it paid into a Special Needs-type trust?

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25. Is PG&E making the sellers indemnify, hold harmless and or defend them in the event of a suit against them?

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26. Is PG&E withholding money for clean-up of other conditions on the sold properties out of their settlements?

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27. Is PG&E willing to open its in process water remediation operations, record-keeping and report compilation process to the public in advance of reporting to Lahontan?

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28. Why is PG&E rejecting putting the Hinkley School on bottled water since the only thing protecting its Chromium 6 levels is injecting clean water to blend down the ch levels in the school wells?

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29. Is PG&E in negotiations or had begun with the Barstow Unified School District to buy the Hinkley School property?

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30. Will PG&E begin regularly testing domestic wells surround the entire plume and including in them in the grid data, if not why not? The residents and commercial users are the the people that will be most likely affected. Handpicked Monitoring Well sites are artificial measurements of impact & putting them in limited areas, does not effectively test to monitor for any changes.

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31. Why isn't PG&E paying the State of California for all of the oversight costs including but not limited to Lahontan staff salaries, expenses and testing?

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32. With the recent additional contamination discovered, why are we pushing for a final solution and a final EIR when the new contamination may suggest the course of action taken is too dangerous to the usable drinking water in the area?

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33. Is the Lahontan letter ordering further investigative action by PG&E dated 11/8/2010 going to be followed through on with NO OBJECTION from PG&E.

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34. Could something other than the term "Final Solution" be used by PG&E--it has historical roots that some in the community find offensive. Is PG&E viewing Hinkley residents as undesirables that need to be removed from the land?

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*Conclusion:

Isn't it time that the dog's tail quit wagging the dog and PG&E get held accountable for their delays and patterns and practice of risk creation and endangerment?

*

Respectfully submitted,

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