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January 24, 2003

File No.

Billie C. Blanchard AICP
Public Utilities Regulatory Analyst V
Project Manager for Jefferson-Martin
Energy Division CEQA Unit
State of California, PUC
505 Van Ness Avenue, 4th Floor
San Francisco, CA 94102

BY HAND DELIVERY

Re: Jefferson-Martin 230 kV Transmission Project: Tabular and Graphic Materials Regarding Magnetic Field Levels for Existing Overhead Double-Circuit 60 kV Line

Dear Ms. Blanchard:

On January 9, 2003, the Energy Division of the California Public Utilities Commission notified Pacific Gas and Electric Company ("PG&E") that its Application for a Certificate of Public Convenience and Necessity Authorizing the Jefferson-Martin 230 kV Transmission Project (No. 02-09-043) ("Application") was complete. In that letter, the Energy Division requested a table and a graph showing magnetic field levels for the existing overhead double-circuit 60 kV line in a format similar to that provided in Table 1 and Graph 1 of Exhibit "F" to the Application. Enclosed please find the requested information. This letter explains the tabular and graphic materials we enclose, and their limitations.

The enclosed tables and graphs provide modeled magnetic field strength tabulations and plots for field strengths at three feet above the ground at distances up to 500 feet on each side of the line for sample spans on three sections of the existing double-circuit 60 kV transmission line that PG&E has proposed to rebuild as part of the proposed Project. Those sections are identified as the following: (1) Ralston-Hillsdale Junction; (2) Crystal Springs-Carolands; and (3) Transposition Tower-Millbrae Tap. PG&E selected these sections and spans because they are the sections and spans where residences have been built closest to the existing utility corridor.

The Energy Division suggested that the requested magnetic field calculations could be modeled using a historic peak flow condition for the existing double-circuit 60 kV line or the maximum design amps. Appendix "F" to the Application projected 2006 normal peak load current (system peak, all lines in service) for the calculations of the magnetic field levels. The enclosed tables and graphs project: (1) a 2006 normal peak current for the existing double-circuit 60 kV line; and (2) a 2006 normal peak

current for the proposed configuration of a 60 kV circuit and a 230 kV circuit. Looking at peak flows for any year prior to 2006 would ignore the fact that flows are expected to increase by 2006 whether or not the proposed Project is built. Use of the 2006 base case will also allow a direct, "apples to apples" comparison of the expected 2006 case with and without the proposed Project.

The maximum magnetic field is obtained at the minimum conductor clearance point, which is normally at midspan. The enclosed table and graphs reflect calculations based on the minimum clearance height of the lowest conductor in the selected spans (the proposed 230 kV line will be approximately 3.6 feet lower than the proposed 60 kV line). Therefore, the calculated magnetic field levels represent the "worst case" for each span as the conductor would be further above the ground at other locations along that span, *i.e.* as the conductor approaches the towers it is higher off the ground, barring significant changes in topography. The minimum conductor clearance for the existing double-circuit 60 kV line is scaled from plan and profile drawings for the existing line. The minimum conductor clearance for the proposed 230 kV/60 kV configuration is calculated based on the projected 2006 normal peak load for each line and section. This will overstate the lines' typical proximity to the ground because, when the conductor is cooler (as it typically is), it rides higher off the ground.

We further note that the expected 2006 normal peak load upon which the magnetic field calculations are based is not expected to be the normal loading on either the existing double-circuit 60 kV line or the proposed 60 kV/230 kV lines. The peak load, by definition, occurs only one day a year. Area loads vary significantly during the 24 hours of a day and during the 365 days in a year. The area load typically would remain at the peak level for only about four to eight hours during that day; and for less than 100 hours in a year. In this general area, PG&E estimates that roughly half the time in a year area loads are less than 70% of the annual peak load. Plotting magnetic fields based on the normal peak load will, therefore, overstate the magnetic fields normally present.

Turning to the attached tables and graphs, for each of the three 60 kV line sections, there are two sets of calculations of the magnetic field levels. The first set represents the existing double-circuit 60 kV line, which is comprised of two separate 60 kV circuits: the Jefferson-Sneath Lane 60 kV circuit (East) and the Jefferson-Martin 60 kV circuit (West). The tables and graphs identify magnetic field levels for the existing 60 kV line sections as the "Existing 2006 Peak." The second set of calculations represents the combination of one 60 kV line and one 230 kV line as proposed in the Application. The tables and graphs identify the calculations of the magnetic field levels of the proposed combination of the 60 kV and 230 kV lines as the "Proposed 2006 Peak."

1. Ralston-Hillsdale Junction

In calculating the magnetic field levels, the span between Towers 5/29 and 5/30 was used as the sample span. The midspan for the existing 60 kV line is 32 feet above ground level, and is assumed to represent the minimum conductor clearance point. The midspan for the proposed 60 kV line is 48.9 feet above ground level, the midspan for the proposed 230 kV line is 46.8 feet above ground level, and each is assumed to represent the minimum conductor clearance point. Based upon analysis by PG&E's Transmission Planning Department, the projected 2006 normal peak load current for the existing Jefferson-Sneath Lane 60 kV circuit is 350 amps. The projected 2006 normal peak load current for the existing Jefferson-Martin 60 kV circuit is 240 amps. Crossphasing occurs on this section of the existing 60 kV line. The projected 2006 normal peak load current for the proposed 60 kV line in this section is 275 amps. The projected 2006 normal peak load current for the proposed 230 kV line in this section is 665 amps. Crossphasing is assumed to occur on the proposed configuration of this section.

2. Crystal Springs-Carolands

In calculating the magnetic field levels, the span between Towers 8/46 and 8/47 was used as the sample span. The midspan for the existing 60 kV line is 31 feet above ground level, and is assumed to represent the minimum conductor clearance point. The midspan for the proposed 60 kV line is 47.6 feet above ground level, the midspan for the proposed 230 kV line is 44 feet above ground level, and each is assumed to represent the minimum conductor clearance point. Based upon analysis by PG&E's Transmission Planning Department, the projected 2006 normal peak load current for the existing Jefferson-Sneath Lane 60 kV circuit is 70 amps. The projected 2006 normal peak load current for the existing Jefferson-Martin 60 kV circuit is 215 amps. Crossphasing exists on this section of the existing 60 kV line. The projected 2006 normal peak load current for the proposed 60 kV line in this section is 70 amps. The projected 2006 normal peak load current for the proposed 230 kV line in this section is 665 amps. Crossphasing is assumed to occur on the proposed configuration of this section.

3. Transposition Tower-Millbrae Tap

In calculating the magnetic field levels, the span between Towers 10/64 and 10/65 was used as the sample span. The midspan for the existing 60 kV line is 31 feet above ground level, and is assumed to represent the minimum conductor clearance point. The midspan for the proposed 60 kV line is 43.2 feet above ground level, the midspan for the proposed 230 kV line is 40.9 feet above ground level, and each is assumed to represent the minimum conductor clearance point. Based upon analysis by PG&E's Transmission Planning Department, the projected 2006 normal peak load current for the existing Jefferson-Sneath Lane 60 kV circuit is 0 amps. The projected current for this section of the existing Jefferson-Sneath Lane 60 kV circuit is 0 amps because a switch on this section of the line is open under normal operating conditions. The projected 2006 normal peak load circuit for the existing Jefferson-

Martin 60kV circuit circuit is 215 amps. Crossphasing occurs on this section of the existing 60 kV line. The projected 2006 normal peak load current for the proposed 60 kV line in this section is 0 amps for the same reason discussed above. The projected 2006 normal peak load current for the proposed 230 kV line in this section is 665 amps. Crossphasing is assumed to occur on the proposed configuration of this section.

* * *

Please let me know if you have any questions about the information provided in this letter or the enclosures.

Very truly yours,

J. Wesley Skow
of LATHAM & WATKINS LLP

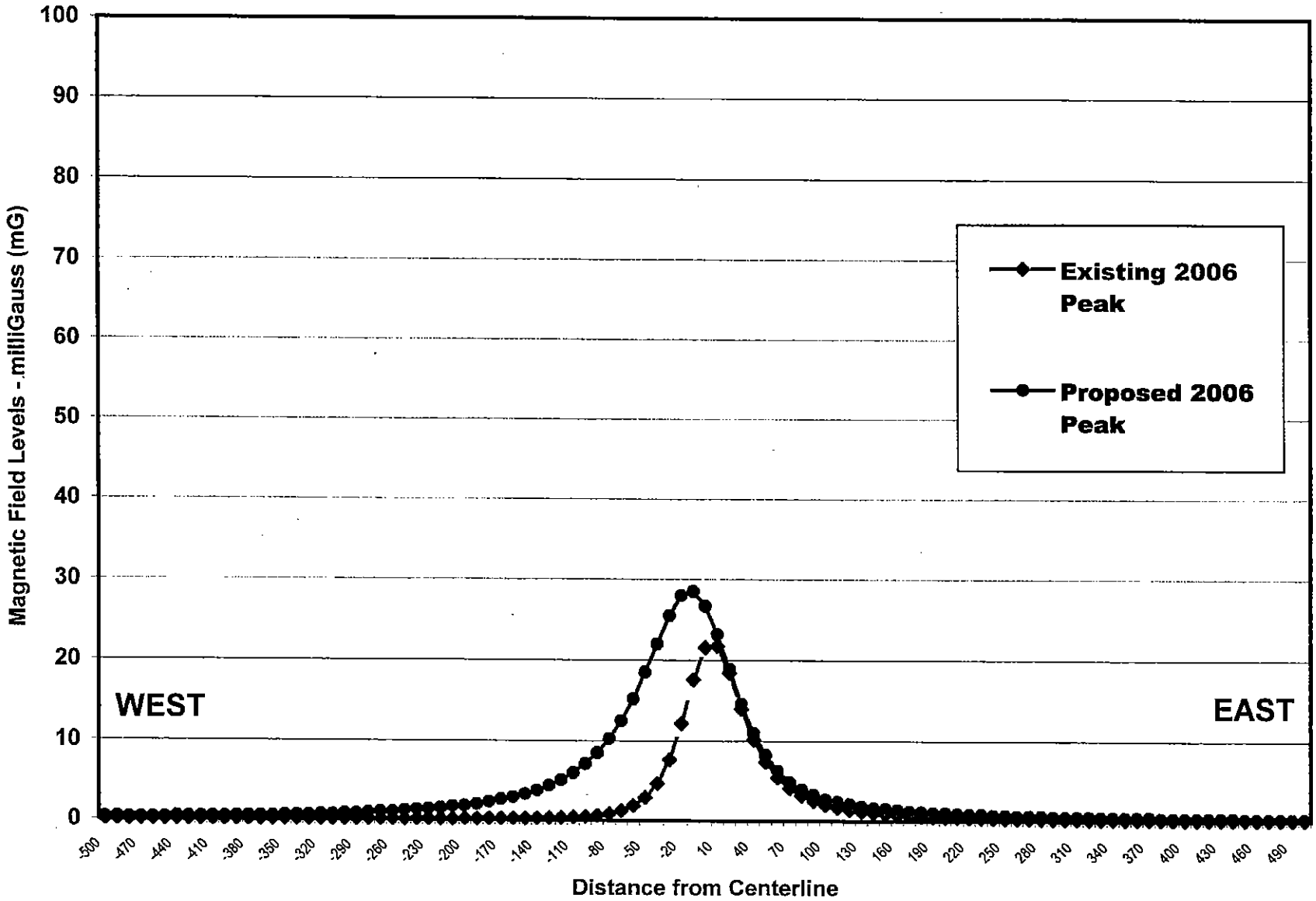
Enclosures

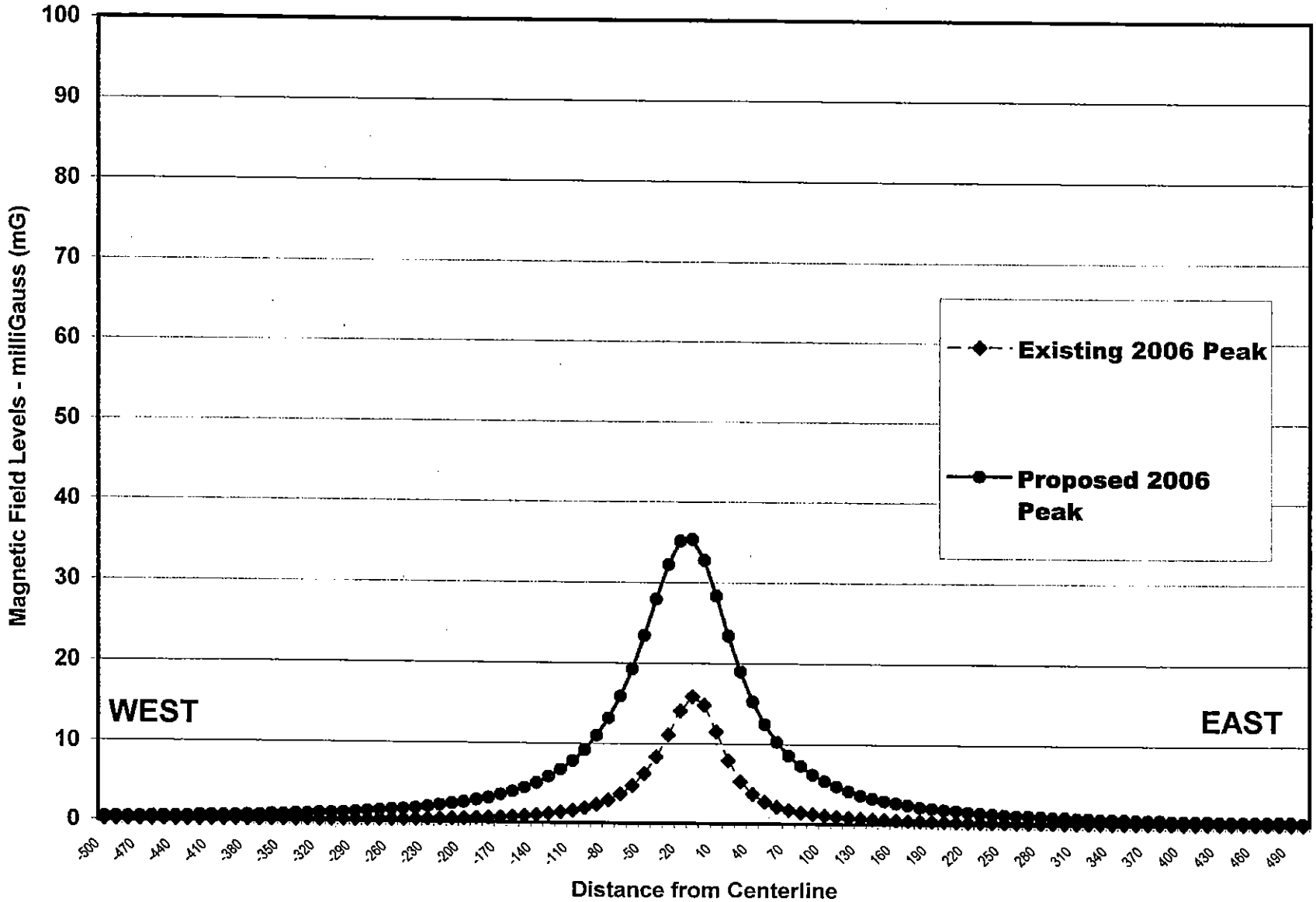
Jefferson-Martin 230 kV Transmission Line
Magnetic Field Levels - milliGauss (mG)

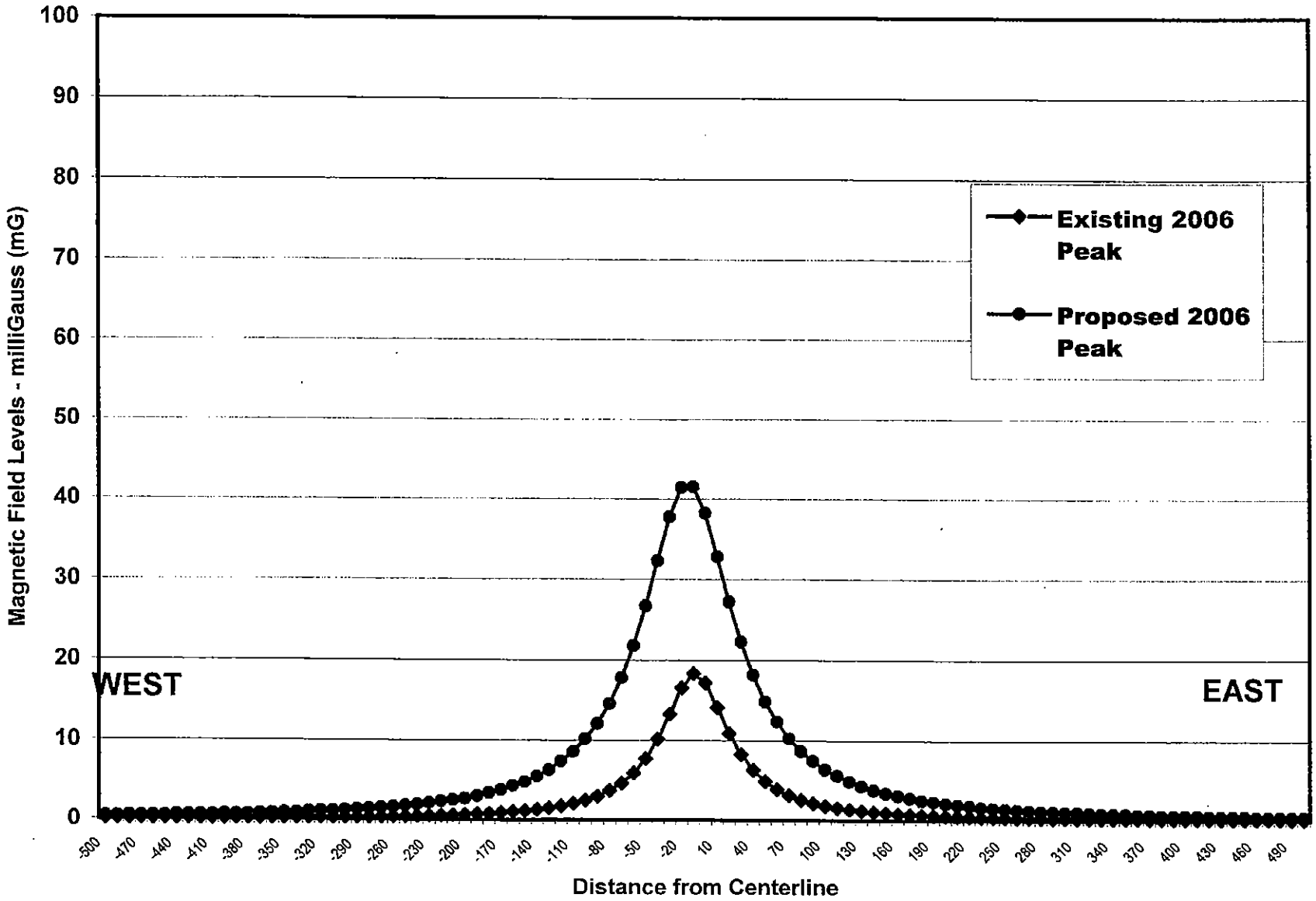
	Ralston-Hillsdale		Crystal Springs - Carolands		Transposition Tower-Millbrae Tap	
	Existing 2006 Peak	Proposed 2006 Peak	Existing 2006 Peak	Proposed 2006 Peak	Existing 2006 Peak	Proposed 2006 Peak
-500	0.0	0.3	0.1	0.4	0.1	0.4
-490	0.0	0.3	0.1	0.4	0.1	0.4
-480	0.0	0.3	0.1	0.4	0.1	0.5
-470	0.0	0.3	0.1	0.4	0.1	0.5
-460	0.0	0.3	0.1	0.5	0.1	0.5
-450	0.0	0.3	0.1	0.5	0.1	0.5
-440	0.1	0.4	0.1	0.5	0.1	0.6
-430	0.1	0.4	0.1	0.5	0.1	0.6
-420	0.1	0.4	0.1	0.6	0.1	0.6
-410	0.1	0.4	0.1	0.6	0.2	0.6
-400	0.1	0.4	0.1	0.6	0.2	0.7
-390	0.1	0.5	0.1	0.6	0.2	0.7
-380	0.1	0.5	0.1	0.7	0.2	0.7
-370	0.1	0.5	0.1	0.7	0.2	0.8
-360	0.1	0.5	0.1	0.8	0.2	0.8
-350	0.1	0.6	0.1	0.8	0.2	0.9
-340	0.1	0.6	0.2	0.9	0.2	0.9
-330	0.1	0.6	0.2	0.9	0.2	1.0
-320	0.1	0.7	0.2	1.0	0.2	1.1
-310	0.1	0.7	0.2	1.0	0.3	1.1
-300	0.1	0.8	0.2	1.1	0.3	1.2
-290	0.1	0.8	0.2	1.2	0.3	1.3
-280	0.1	0.9	0.2	1.3	0.3	1.4
-270	0.1	1.0	0.3	1.4	0.4	1.5
-260	0.1	1.0	0.3	1.5	0.4	1.6
-250	0.1	1.2	0.3	1.6	0.4	1.8
-240	0.1	1.3	0.3	1.7	0.4	1.9
-230	0.1	1.4	0.3	1.9	0.5	2.1
-220	0.1	1.5	0.4	2.1	0.5	2.3
-210	0.2	1.7	0.4	2.3	0.6	2.5
-200	0.2	1.8	0.5	2.5	0.6	2.7
-190	0.2	2.0	0.5	2.8	0.7	3.0
-180	0.2	2.3	0.6	3.1	0.8	3.4
-170	0.2	2.6	0.7	3.5	0.9	3.8
-160	0.2	2.9	0.7	3.9	1.0	4.3
-150	0.2	3.3	0.8	4.4	1.1	4.8
-140	0.3	3.8	1.0	5.0	1.3	5.5
-130	0.3	4.4	1.1	5.8	1.5	6.3
-120	0.3	5.1	1.3	6.7	1.8	7.4
-110	0.4	6.0	1.6	7.8	2.1	8.6
-100	0.5	7.1	1.9	9.2	2.5	10.2
-90	0.6	8.5	2.3	11.0	3.0	12.1
-80	0.9	10.3	2.9	13.2	3.7	14.6
-70	1.2	12.5	3.7	15.9	4.7	17.8
-60	1.9	15.2	4.7	19.3	6.0	21.8
-50	2.9	18.5	6.3	23.4	7.8	26.7
-40	4.7	22.0	8.4	27.9	10.2	32.3
-30	7.7	25.5	11.1	32.2	13.3	37.7
-20	12.2	28.0	14.1	35.1	16.6	41.4
-10	17.6	28.5	15.9	35.3	18.4	41.5
0	21.6	26.7	14.9	32.7	17.2	38.2

Jefferson-Martin 230 kV Transmission Line
Magnetic Field Levels - milliGauss (mG)

	Ralston-Hillsdale		Crystal Springs - Carolands		Transposition Tower-Millbrae Tap	
	Existing 2006 Peak	Proposed 2006 Peak	Existing 2006 Peak	Proposed 2006 Peak	Existing 2006 Peak	Proposed 2006 Peak
10	21.8	23.2	11.5	28.3	14.2	32.8
20	18.4	18.9	7.9	23.4	10.9	27.2
30	14.0	14.6	5.3	19.0	8.3	22.3
40	10.2	11.0	3.7	15.3	6.4	18.2
50	7.4	8.3	2.7	12.5	5.0	14.9
60	5.5	6.3	2.1	10.3	3.9	12.4
70	4.1	4.9	1.7	8.6	3.2	10.3
80	3.2	4.0	1.4	7.3	2.6	8.7
90	2.5	3.3	1.2	6.2	2.2	7.5
100	2.0	2.7	1.0	5.4	1.8	6.4
110	1.6	2.4	0.9	4.7	1.6	5.6
120	1.4	2.1	0.8	4.1	1.4	4.9
130	1.1	1.8	0.7	3.6	1.2	4.3
140	1.0	1.6	0.6	3.2	1.0	3.8
150	0.8	1.5	0.5	2.9	0.9	3.4
160	0.7	1.4	0.5	2.6	0.8	3.1
170	0.6	1.2	0.4	2.4	0.7	2.8
180	0.6	1.1	0.4	2.1	0.7	2.5
190	0.5	1.0	0.4	2.0	0.6	2.3
200	0.4	1.0	0.3	1.8	0.5	2.1
210	0.4	0.9	0.3	1.7	0.5	1.9
220	0.4	0.8	0.3	1.5	0.5	1.8
230	0.3	0.8	0.3	1.4	0.4	1.6
240	0.3	0.7	0.2	1.3	0.4	1.5
250	0.3	0.7	0.2	1.2	0.4	1.4
260	0.2	0.6	0.2	1.1	0.3	1.3
270	0.2	0.6	0.2	1.1	0.3	1.2
280	0.2	0.6	0.2	1.0	0.3	1.1
290	0.2	0.5	0.2	0.9	0.3	1.1
300	0.2	0.5	0.2	0.9	0.3	1.0
310	0.2	0.5	0.2	0.8	0.2	1.0
320	0.2	0.5	0.1	0.8	0.2	0.9
330	0.1	0.4	0.1	0.7	0.2	0.8
340	0.1	0.4	0.1	0.7	0.2	0.8
350	0.1	0.4	0.1	0.7	0.2	0.8
360	0.1	0.4	0.1	0.6	0.2	0.7
370	0.1	0.4	0.1	0.6	0.2	0.7
380	0.1	0.3	0.1	0.6	0.2	0.6
390	0.1	0.3	0.1	0.5	0.2	0.6
400	0.1	0.3	0.1	0.5	0.1	0.6
410	0.1	0.3	0.1	0.5	0.1	0.6
420	0.1	0.3	0.1	0.5	0.1	0.5
430	0.1	0.3	0.1	0.4	0.1	0.5
440	0.1	0.3	0.1	0.4	0.1	0.5
450	0.1	0.2	0.1	0.4	0.1	0.5
460	0.1	0.2	0.1	0.4	0.1	0.4
470	0.1	0.2	0.1	0.4	0.1	0.4
480	0.1	0.2	0.1	0.4	0.1	0.4
490	0.1	0.2	0.1	0.4	0.1	0.4
500	0.1	0.2	0.1	0.3	0.1	0.4


Jefferson-Martin 230 kV Transmission Line Project
Ralston - Hillsdale Junction section of line
Magnetic Field Levels - milliGauss (mG)
100
90
80
70
60
50
40
30
20
10
0
Existing 2006 Peak
Proposed 2006 Peak
WEST
EAST
-500 -470 -440 -410 -380 -350 -320 -290 -260 -230 -200 -170 -140 -110 -80 -50 -20 10 40 70 100 130 160 190 220 250 280 310 340 370 400 430 460 490
Distance from Centerline


Jefferson-Martin 230 kV Transmission Line Project
Crystal Springs - Carolands section of line
Magnetic Field Levels - milliGauss (mG)
100
90
80
70
60
50
40
30
20
10
0
Existing 2006 Peak
Proposed 2006 Peak
WEST
EAST
-500 -470 -440 -410 -380 -350 -320 -290 -260 -230 -200 -170 -140 -110 -80 -50 -20 10 40 70 100 130 160 190 220 250 280 310 340 370 400 430 460 490
Distance from Centerline


Jefferson-Martin 230 kV Transmission Line Project
Transposition Tower - Millbrae Tap section of line
Magnetic Field Levels - milliGauss (mG)
100
90
80
70
60
50
40
30
20
10
0
Existing 2006 Peak
Proposed 2006 Peak
WEST
EAST
-500 -470 -440 -410 -380 -350 -320 -290 -260 -230 -200 -170 -140 -110 -80 -50 -20 10 40 70 100 130 160 190 220 250 280 310 340 370 400 430 460 490
Distance from Centerline