

Alcoa Iceland

New Modeling Scenarios

June 22, 2006

Summary of New Scenarios

	Sea Water Scrubbers?	Description	Sulfur Content	Fluoride Emissions	Notes
Scenario C'	Yes	Anode Cooling with SWS	1.8% S	Annual	Same as Scen C except for reduction in Sulfur Content (3.0% S → 1.8% S)
Scenario E	Yes	Anode Cooling to SWS	3.0% S	Annual	Same as Scen C except for increased SWS stack diameter (4.38 m → 4.93 m)
Scenario E'	Yes	Anode Cooling to SWS	1.8% S	---	Same as Scen E except for reduction in Sulfur Content (3.0% S → 1.8% S)
Scenario F	Yes	Anode Cooling to SWS	---	Growing Season	Same as Scen E except for increased HF emissions from the line sources
Scenario G	Yes	Anode Cooling to GTC to SWS	3.0% S	Annual	Same as Scen E except for decreased HF emissions from SWS stacks (0.024 g/s → 0.020 g/s)
Scenario G'	Yes	Anode Cooling to GTC to SWS	1.8% S	---	Same as Scen E' because no change in SO ₂ from Scen E to Scen G
Scenario H	Yes	Anode Cooling to GTC to SWS	---	Growing Season	Same as Scen G except for increased HF emissions from the line sources
Scenario I	No	Anode Cooling to GTC	1.8% S	Annual	Same as Scen A except for decreased HF emissions from Fume/Anode Cooling Stack (0.94 g/s → 0.78 g/s)
Scenario J	No	Anode Cooling to GTC	---	Growing Season	Same as Scen I except for increased HF emissions from the line sources

SCENARIO C': WITH Seawater Scrubbers – Annual Fluoride Emissions – 1.8% S

Table 2-1. Point Source Parameters and Emission Rates – Scenario C'¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Anode Cooling	542.366	7212.451	78.0	14	9.45	3.17	288.15	0.33	0.018	0	0.45	0	0
Seawater Scrubber #1	542.246	7212.111	40.0	12	4.38	14.0	288.15	0.02	0.012	0.72 ²	0.30	1.77E-04	3.54E-06
Seawater Scrubber #2	542.298	7212.141	40.0	12	4.38	14.0	288.15	0.02	0.012	0.72 ²	0.30	1.77E-04	3.54E-06
Seawater Scrubber #3	542.350	7212.170	40.0	12	4.38	14.0	288.15	0.02	0.012	0.72 ²	0.30	1.77E-04	3.54E-06
Seawater Scrubber #4	542.402	7212.200	40.0	12	4.38	14.0	288.15	0.02	0.012	0.72 ²	0.30	1.77E-04	3.54E-06
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0	0	0.05	0	0
Casthouse Furnace #2	541.816	7211.866	29.5	12	0.8	12.0	553.15	0	0	0	0.05	0	0
Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0	0	0.05	0	0

(1) Emissions data is from spreadsheet "Model_campgn_4.xls" transmitted in the email from Michael Palazzolo to Joe Scire dated June 28, 2005.

(2) SO₂ emission rate based on 1.8% sulfur in baked anode [$1.2\text{g/s} \times (1.8\%/3.0\%) = 0.72\text{g/s}$].

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario C'¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.59	0.395	1.46 ²	0.29	2.14E-03	2.14E-05
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.59	0.395	1.46 ²	0.29	2.14E-03	2.14E-05

(1) Emissions data is from spreadsheet "Model_campgn_4.xls" transmitted in the email from Michael Palazzolo to Joe Scire dated June 28, 2005.

(2) SO₂ emission rate based on 1.8% sulfur in baked anode.

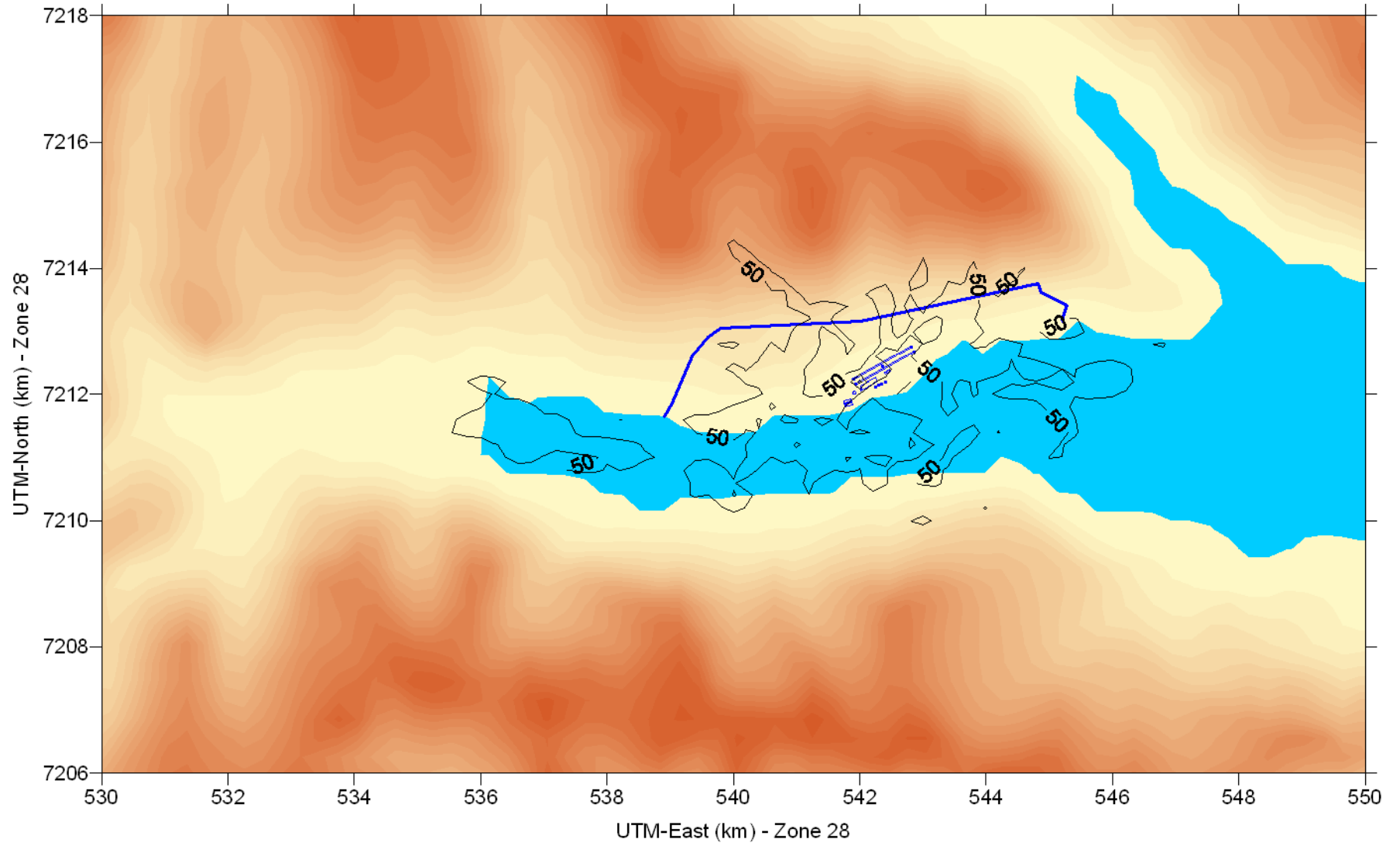
Table 8-2. Summary of CALPUFF Modeling Results for Scenario C'

Parameter	Averaging Period	Limit Value ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed ¹	Number of Exceedances Predicted ¹	In Compliance?
SO ₂	1-hour	350	24	0	Yes
	24- consecutive hours	50	7	0	Yes
		125	3	0	Yes
	Winter season (October 1- March 31)	20	0	0	Yes
	Annual	20	0	0	Yes

¹ Maximum number of exceedances at any receptor outside the dilution zone.

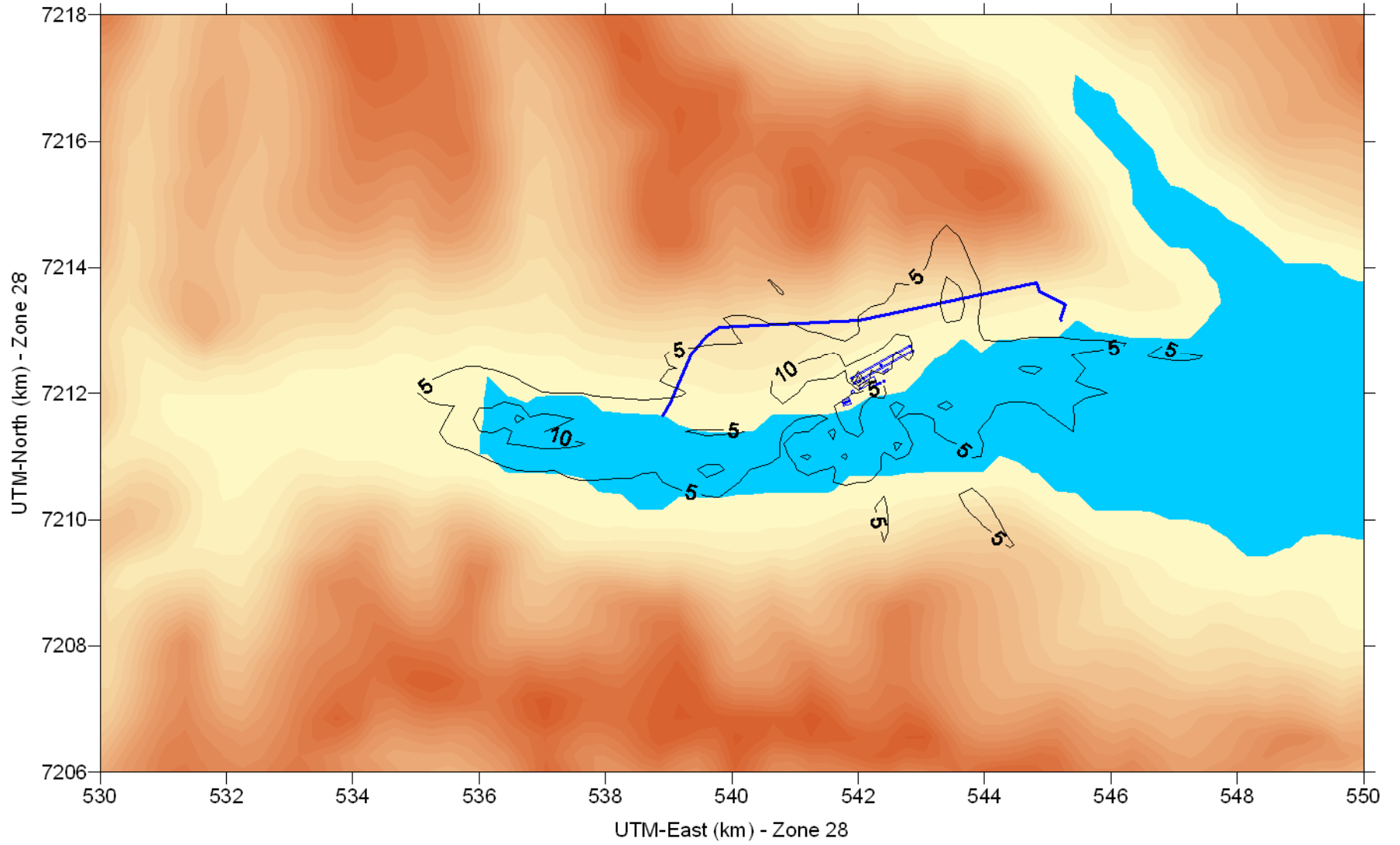
Scenario C'

SO2 1hr (ug/m^3)



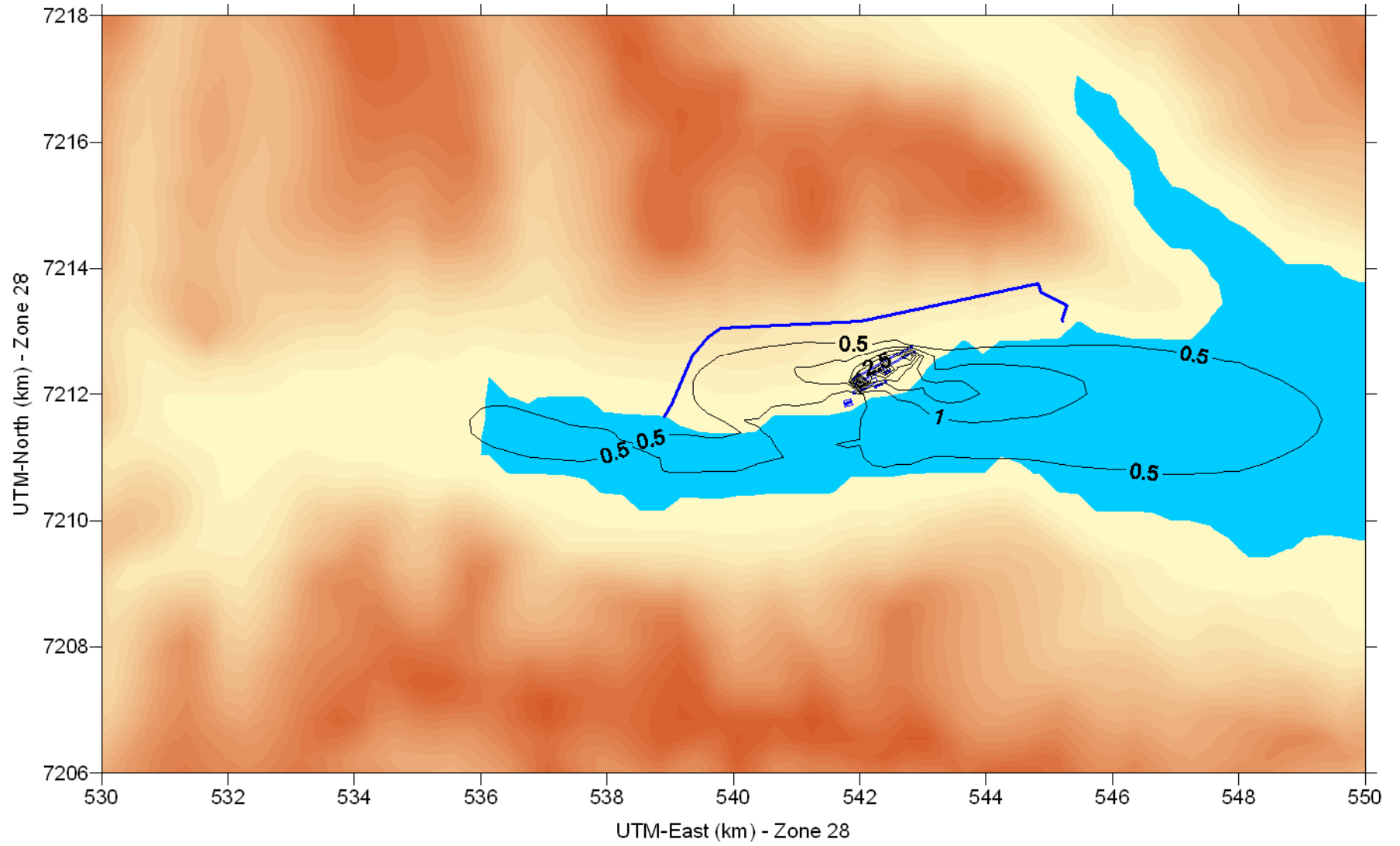
Scenario C'

SO2 24hr (ug/m³)



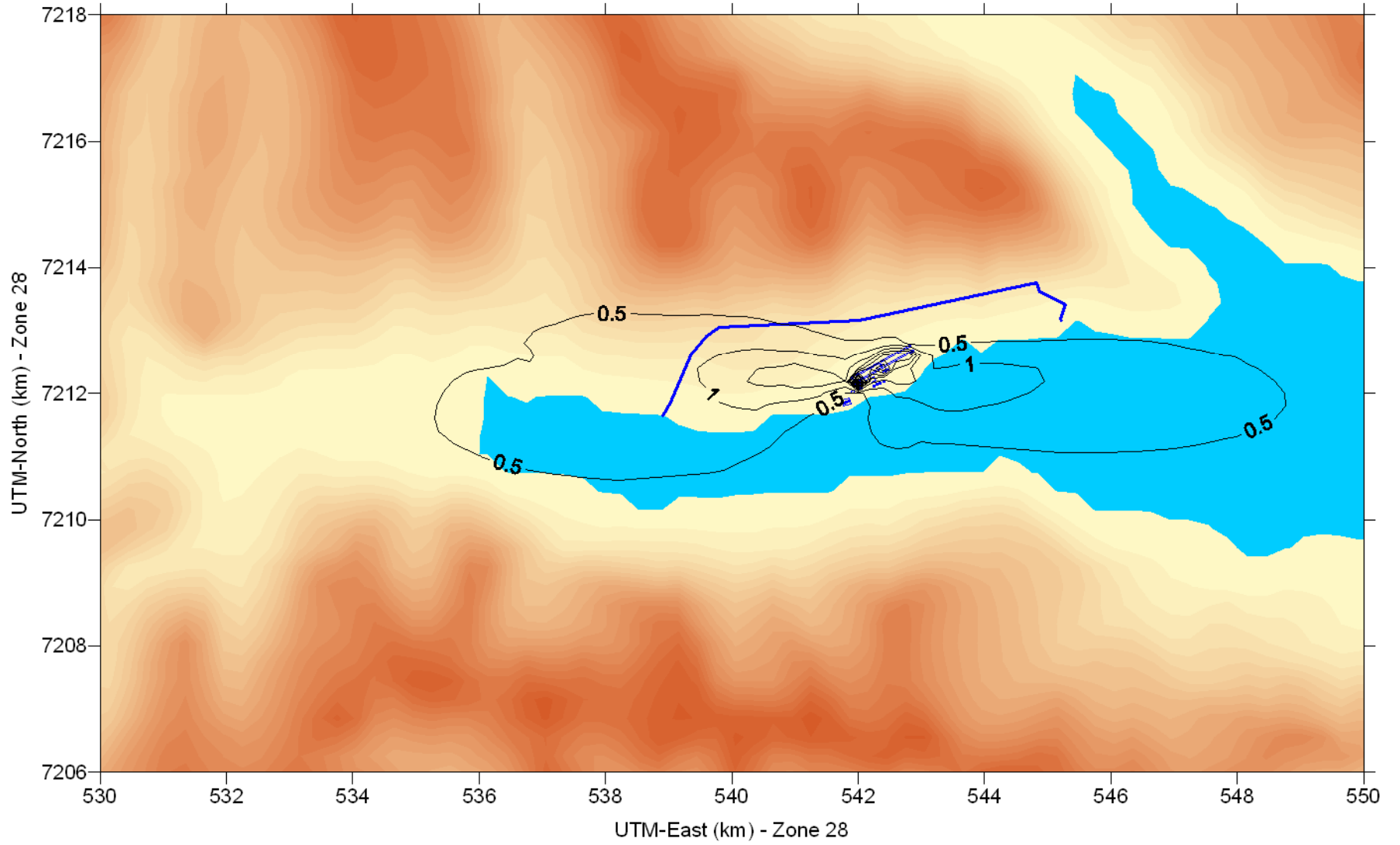
Scenario C'

SO2 Winter Season [October 2000 - March 2001] ($\mu\text{g}/\text{m}^3$)



Scenario C'

SO2 Annual (ug/m³)



SCENARIO E: WITH Seawater Scrubbers – Anode Cooling to SWS – Annual Fluoride Emissions – 3.0% S

Table 2-1. Point Source Parameters and Emission Rates – Scenario E¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Seawater Scrubber #1	542.246	7212.111	40.0	12	4.93	14.0	288.15	0.024	0.015	1.2 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #2	542.298	7212.141	40.0	12	4.93	14.0	288.15	0.024	0.015	1.2 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #3	542.350	7212.170	40.0	12	4.93	14.0	288.15	0.024	0.015	1.2 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #4	542.402	7212.200	40.0	12	4.93	14.0	288.15	0.024	0.015	1.2 ³	0.38	1.77E-04 ²	3.54E-06 ²
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
Casthouse Furnace #2	541.816	7211.866	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 Emission rates transmitted in the email from Michael Palazzolo to Joe Scire dated June 13, 2006.

3 SO₂ emission rate based on 3.0 % sulfur in baked anode.

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario E¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.59	0.395	2.43 ²	0.29	2.14E-03	2.14E-05
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.59	0.395	2.43 ²	0.29	2.14E-03	2.14E-05

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 SO₂ emission rate based on 3.0% sulfur in baked anode.

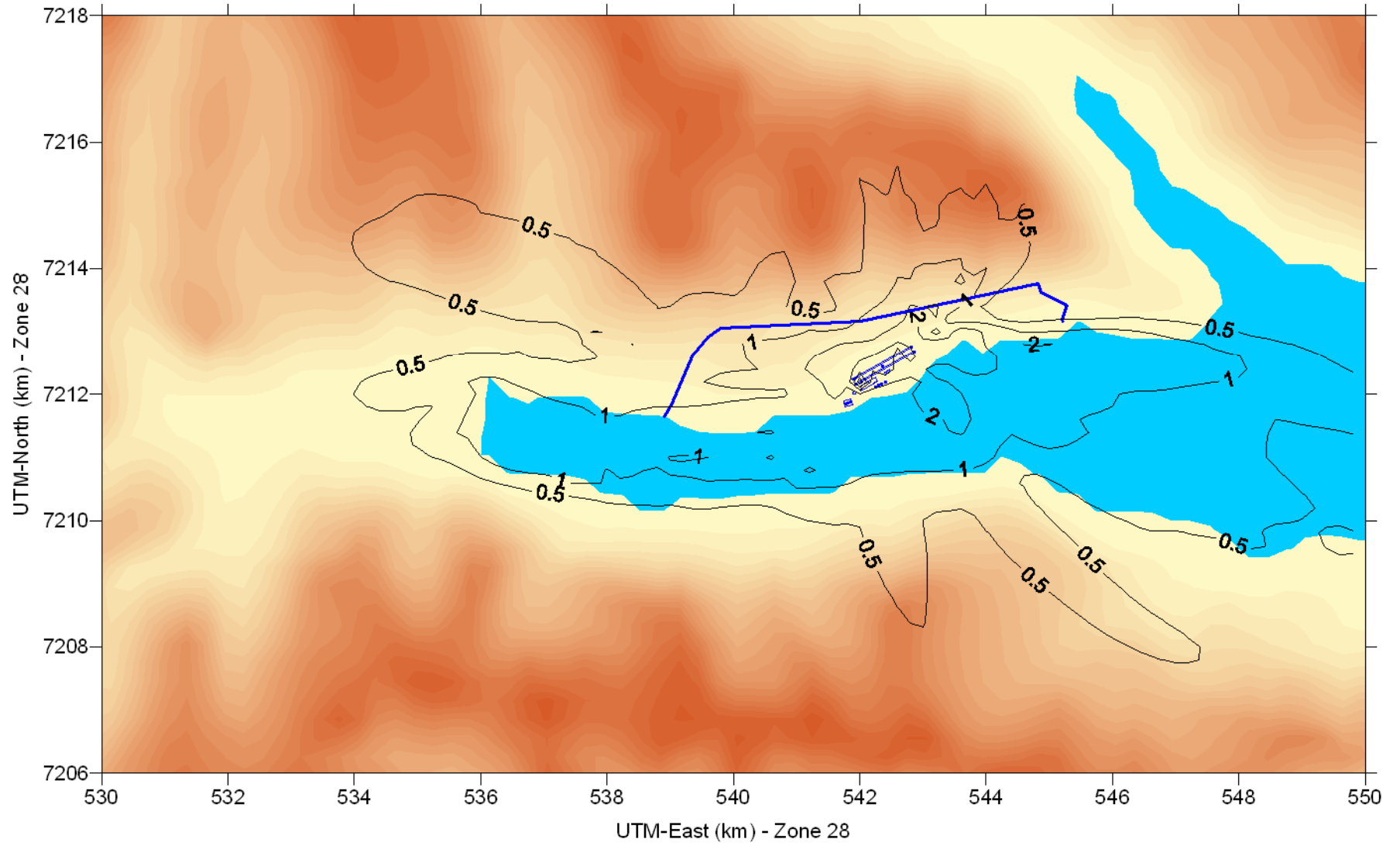
Table 8-2. Summary of CALPUFF Modeling Results for Scenario E

Parameter	Averaging Period	Limit Value ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed ¹	Number of Exceedances Predicted ¹	In Compliance?
HF	24-consecutive hours	25	0	0	Yes
	Growing season (April 1 – September 30)	0.3	0	0	Yes
SO ₂	1-hour	350	24	0	Yes
	24- consecutive hours	50	7	0	Yes
		125	3	0	Yes
	Winter season (October 1- March 31)	20	0	0	Yes
	Annual	20	0	0	Yes
PM ₁₀	24-consecutive hours	50	7	0	Yes
	Annual	20	0	0	Yes
BaP (x100 = PAH)	Annual	0.1-1 ng/m ³	0	0	Yes

¹ Maximum number of exceedances at any receptor outside the dilution zone.

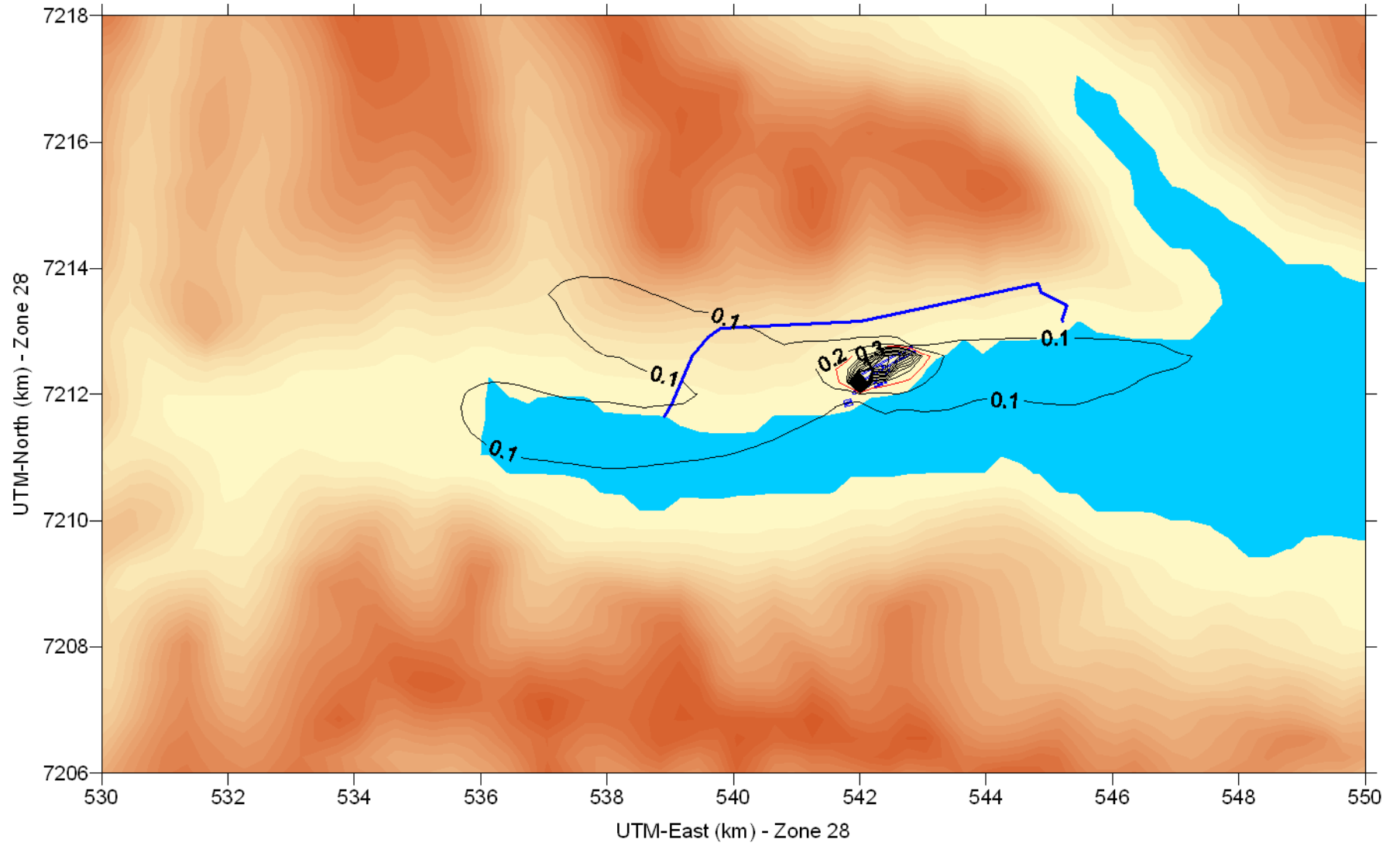
Scenario E

HF 24hr ($\mu\text{g}/\text{m}^3$)



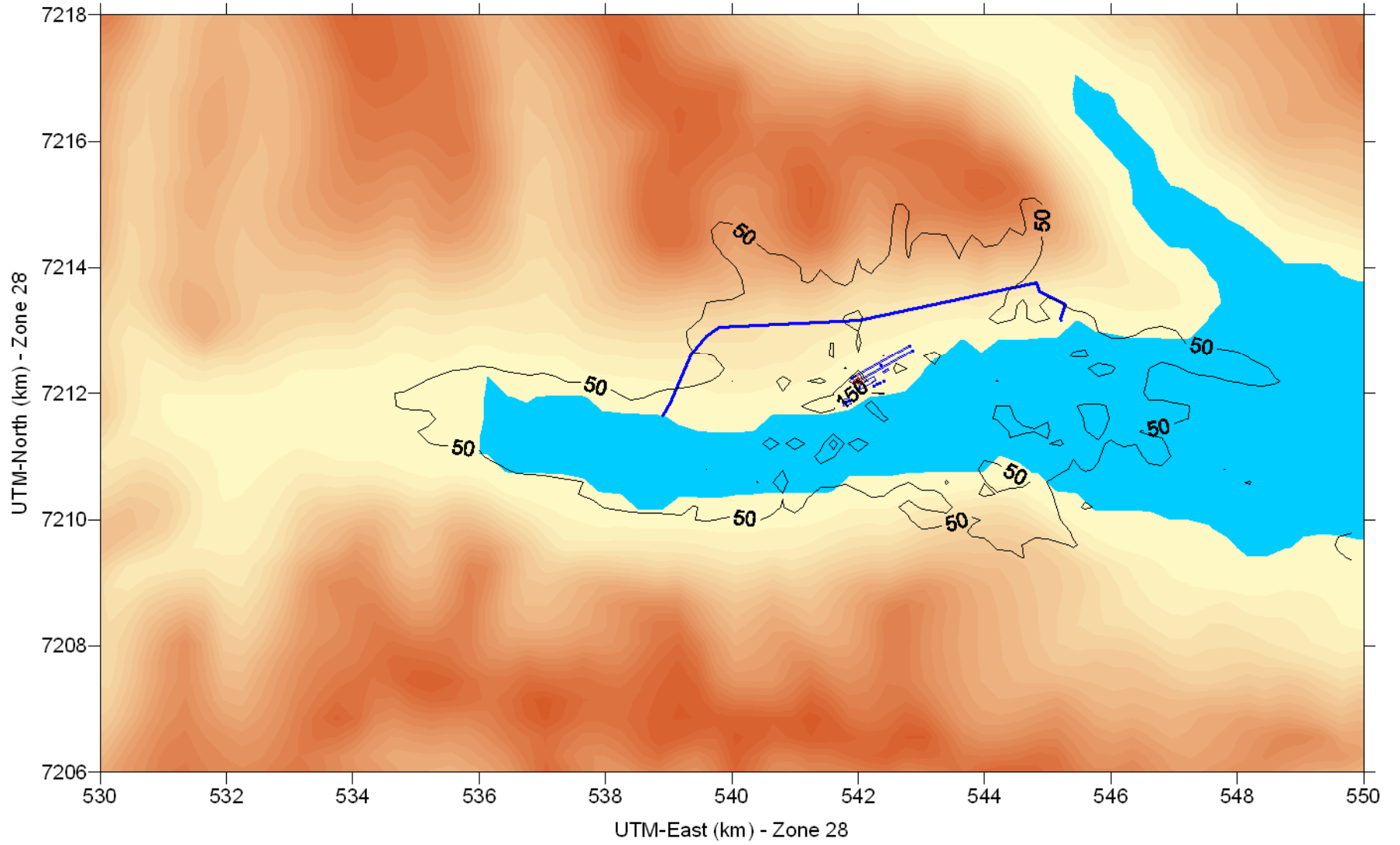
Scenario E

HF Growing Season [7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)



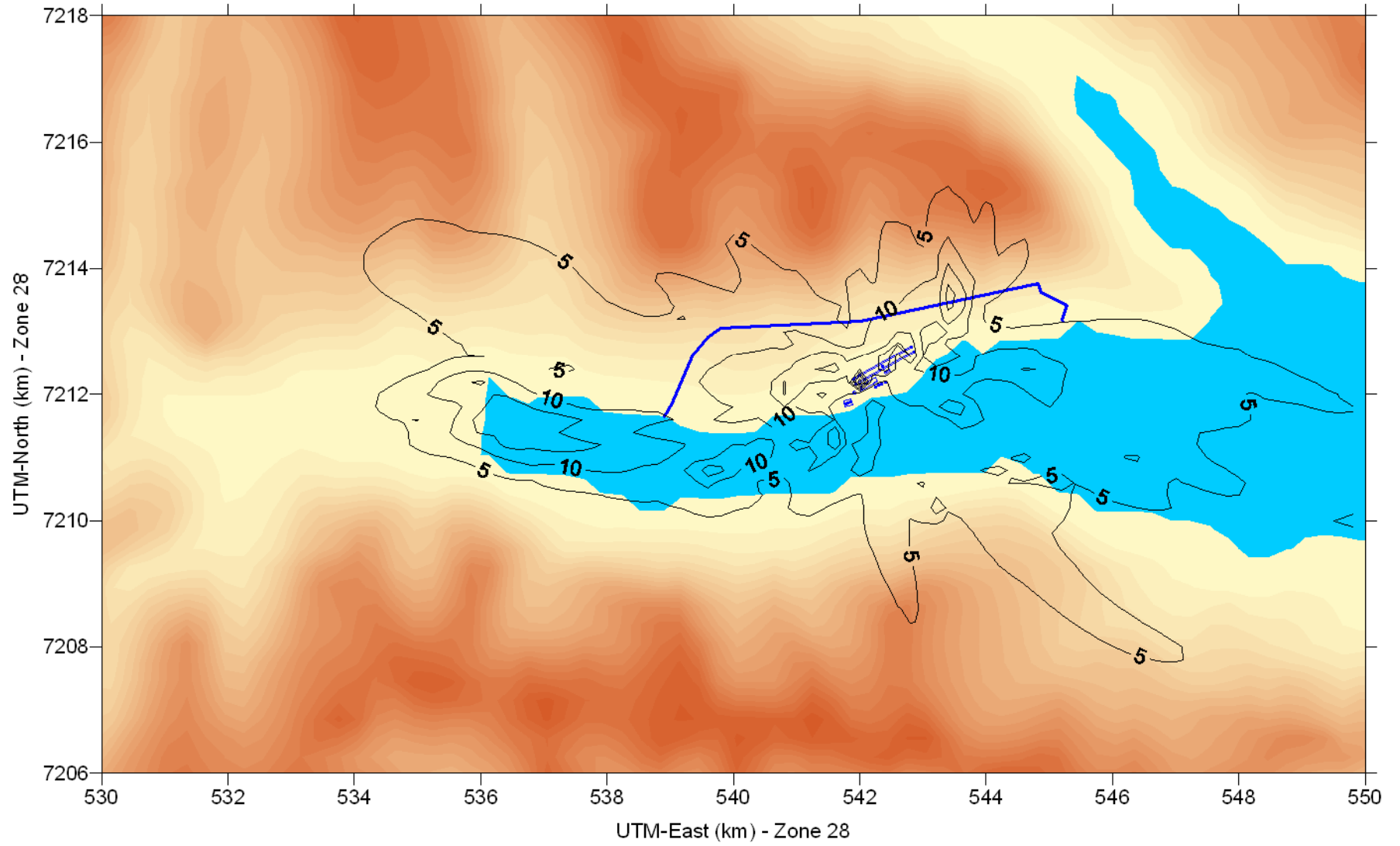
Scenario E

SO2 1hr (ug/m³)



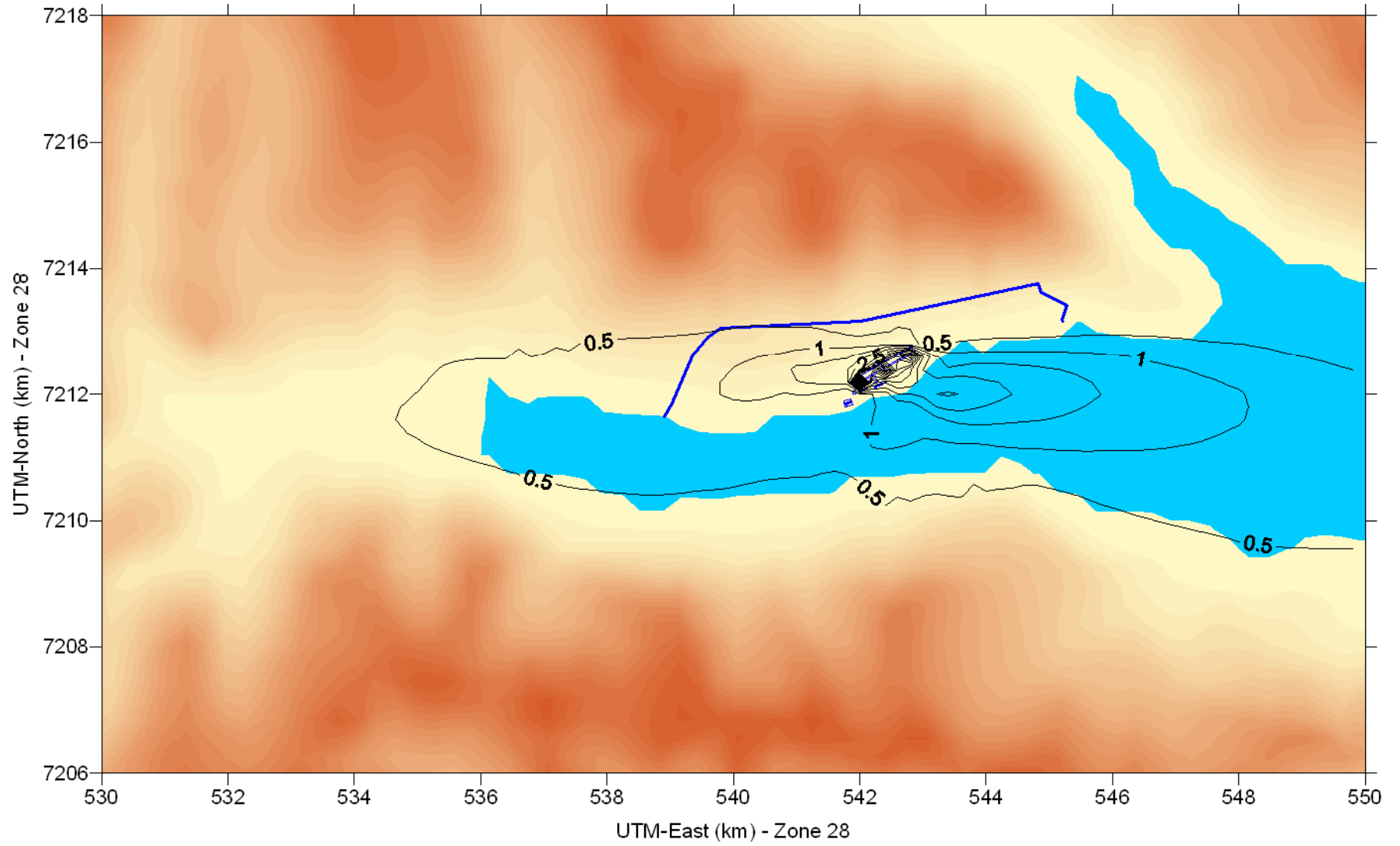
Scenario E

SO2 24hr (ug/m³)



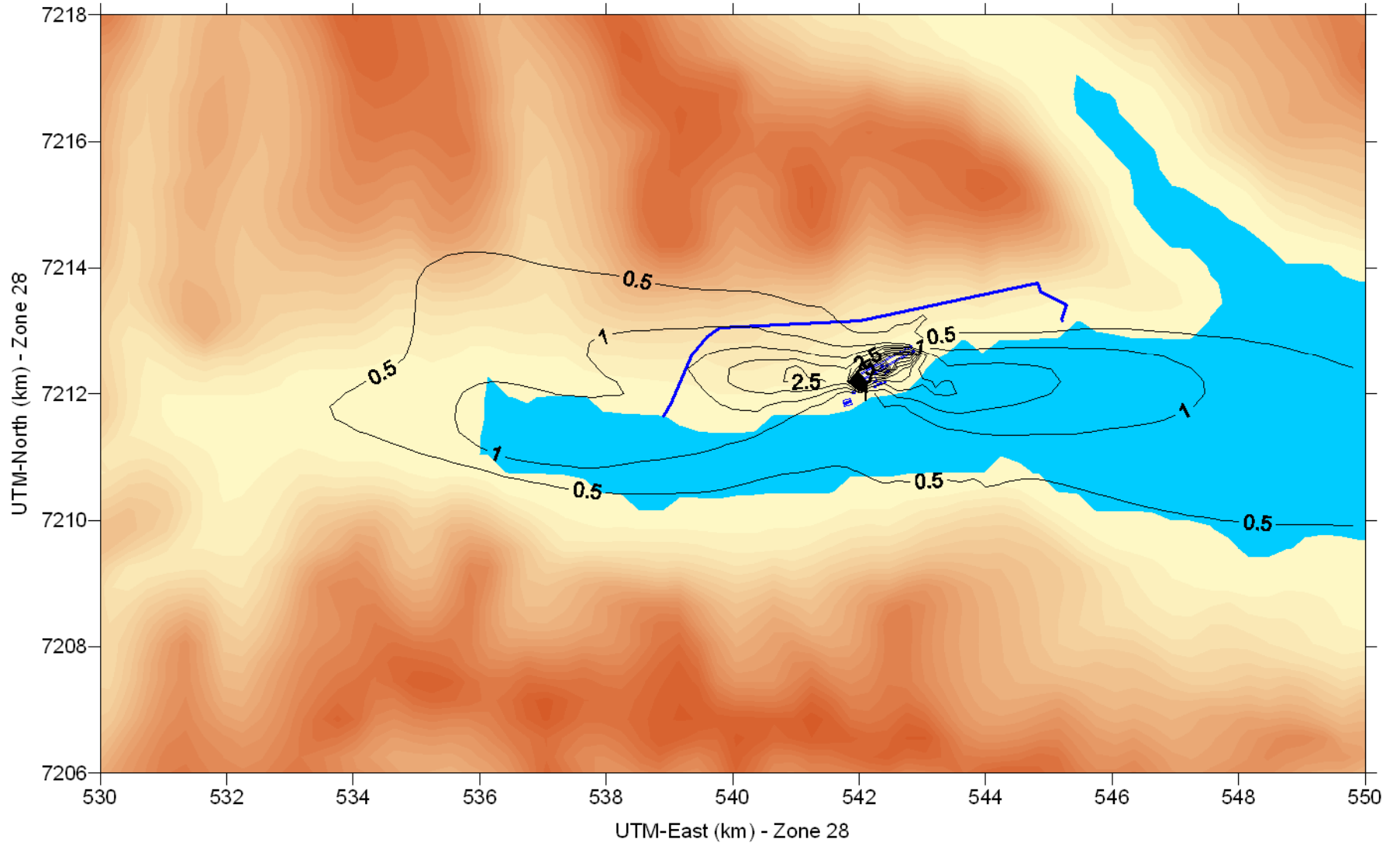
Scenario E

SO2 Winter Season [October 2000 - March 2001] ($\mu\text{g}/\text{m}^3$)



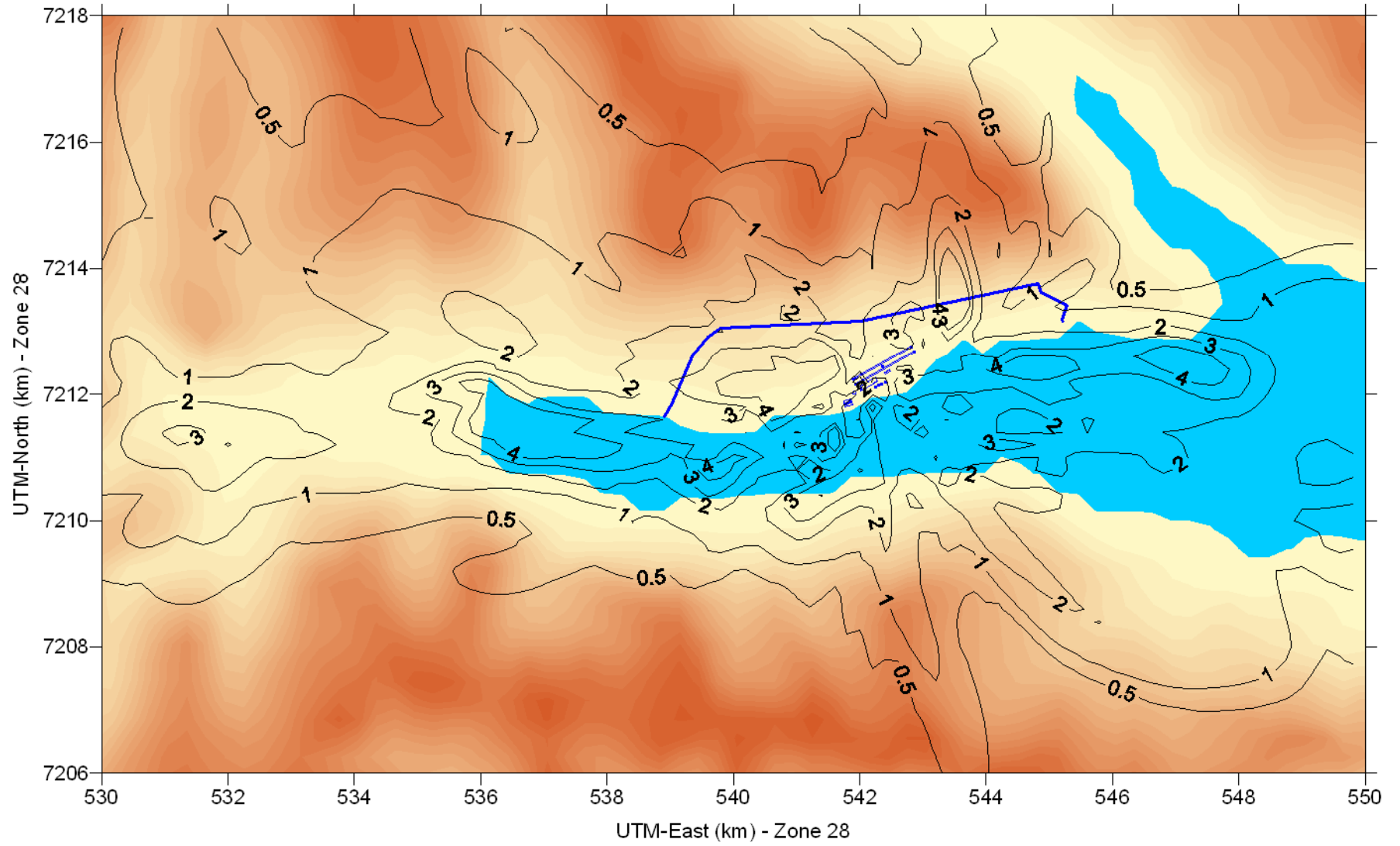
Scenario E

SO2 Annual (ug/m³)



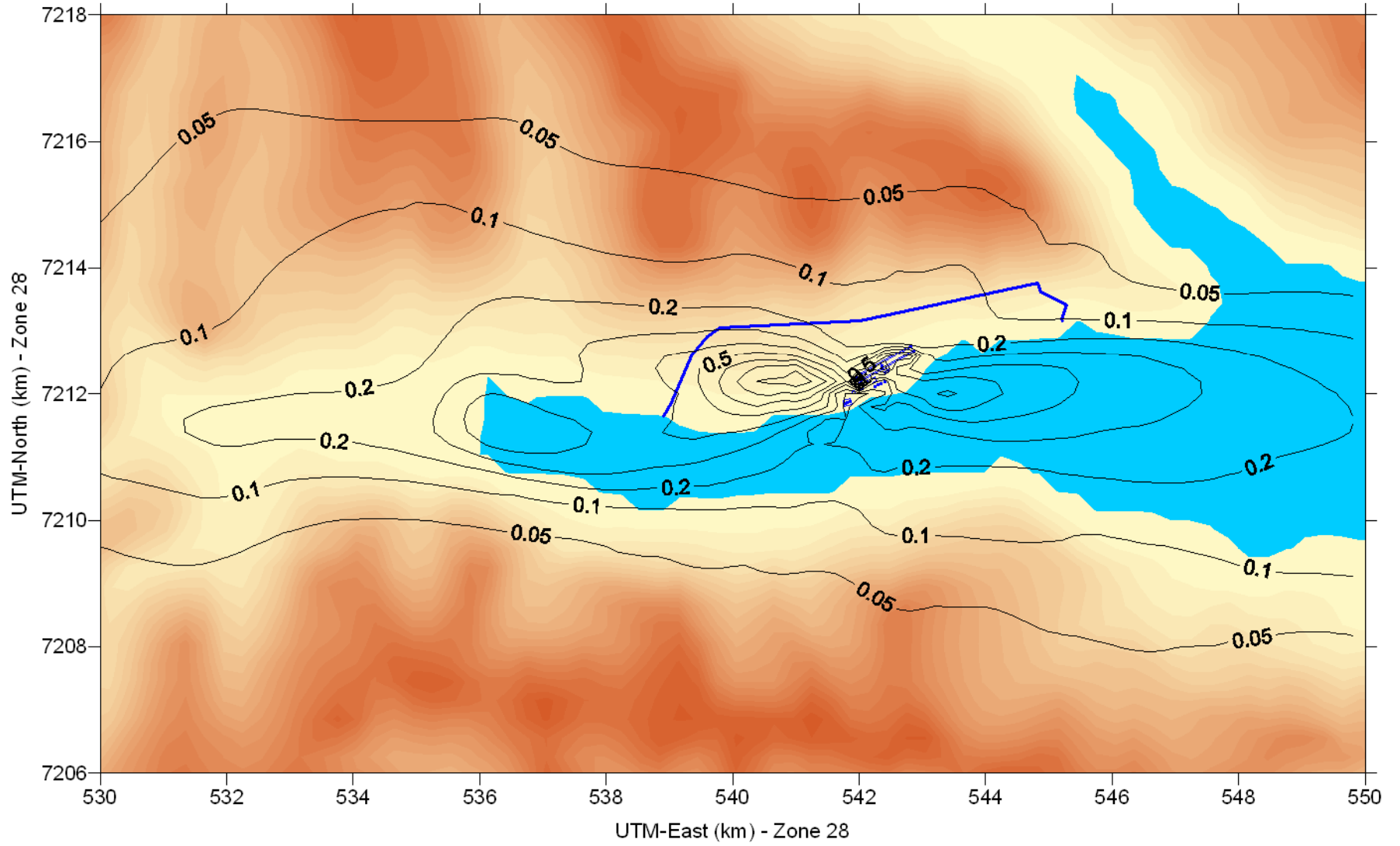
Scenario E

PM10 24hr (ug/m³)



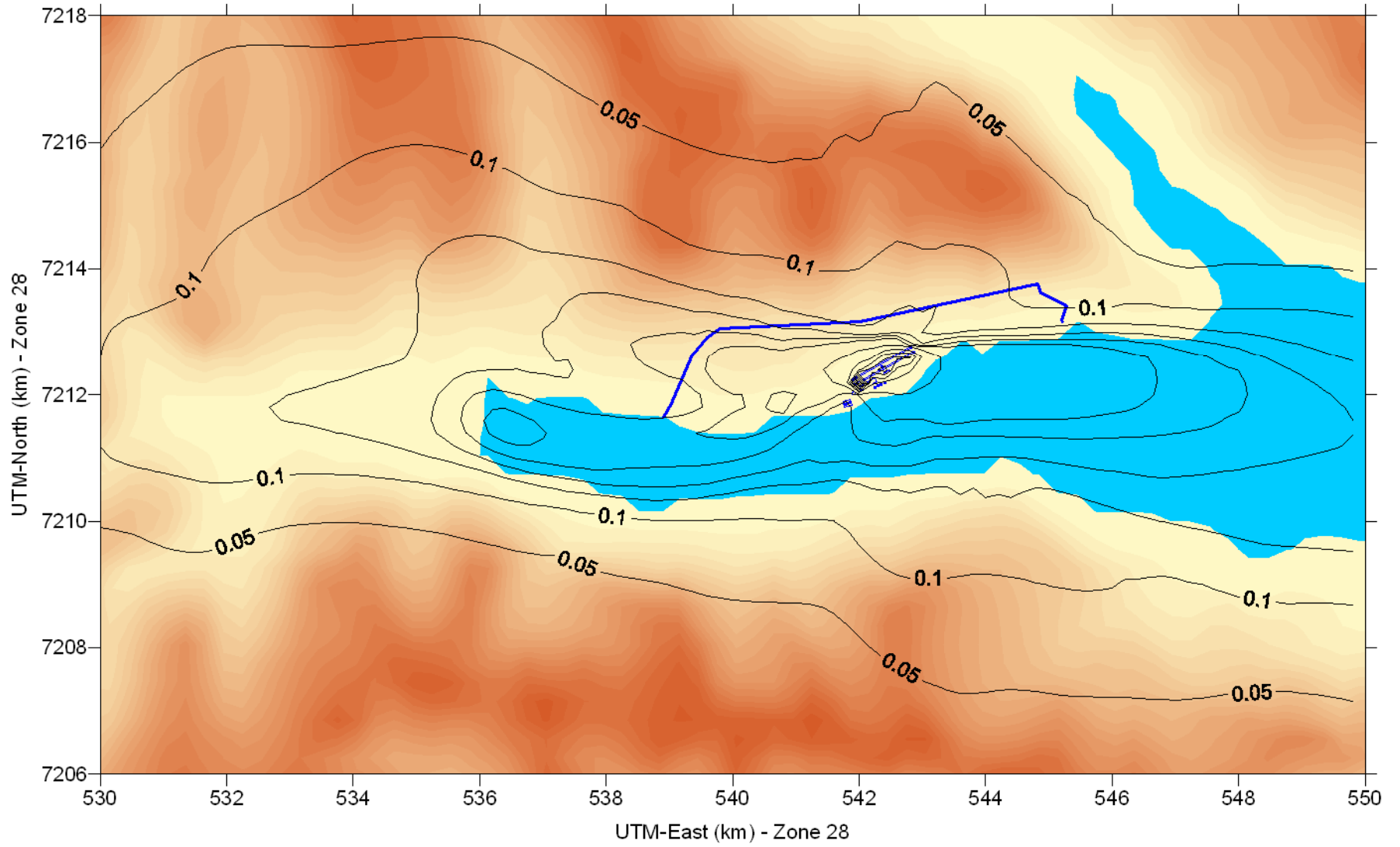
Scenario E

PM10 Annual ($\mu\text{g}/\text{m}^3$)



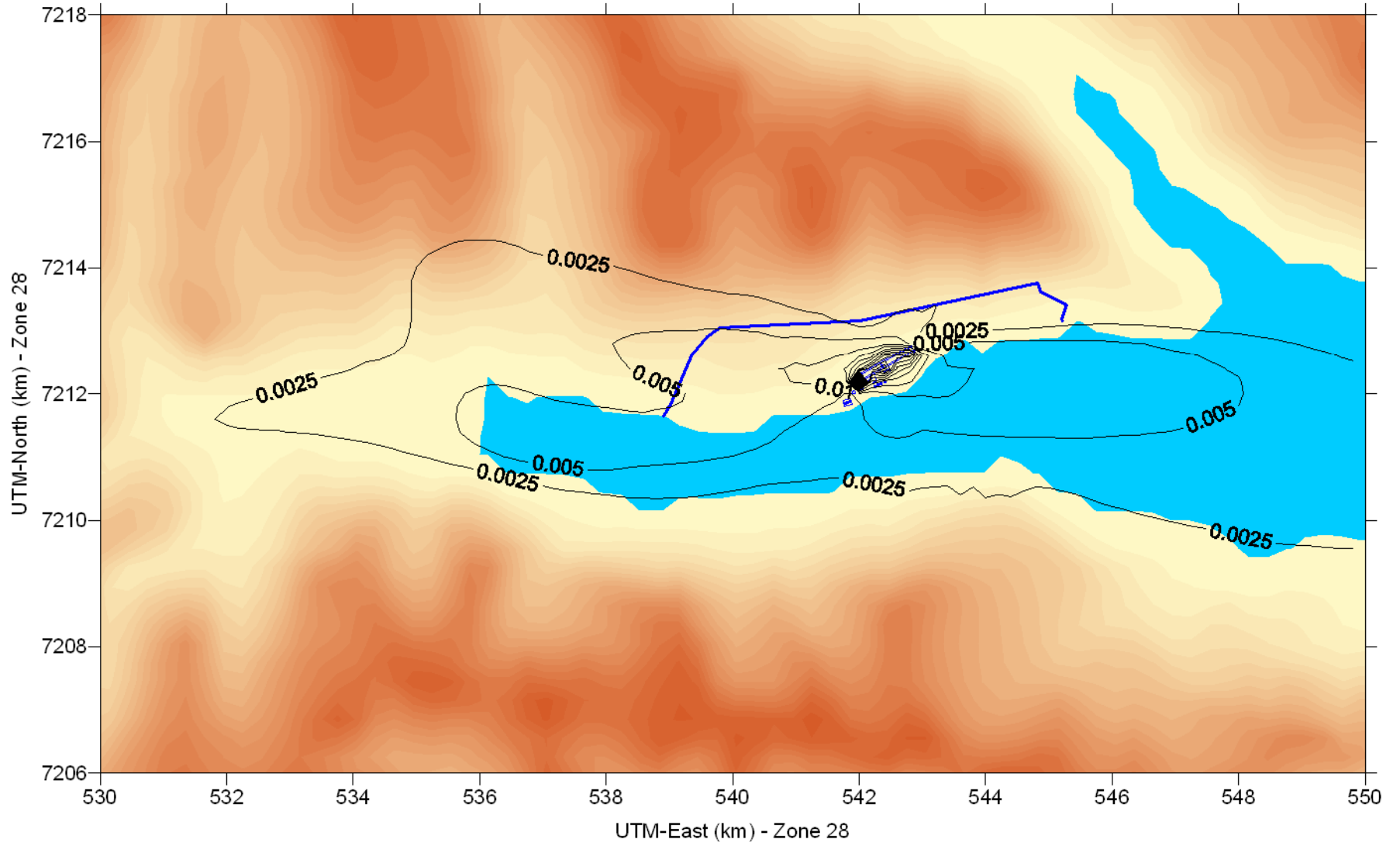
Scenario E

PAH Annual (ng/m³)



Scenario E

BaP Annual (ng/m³)



SCENARIO E': WITH Seawater Scrubbers – Anode Cooling to SWS – Annual Fluoride Emissions – 1.8% S

Table 2-1. Point Source Parameters and Emission Rates – Scenario E'¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Seawater Scrubber #1	542.246	7212.111	40.0	12	4.93	14.0	288.15	0.024	0.015	0.72 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #2	542.298	7212.141	40.0	12	4.93	14.0	288.15	0.024	0.015	0.72 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #3	542.350	7212.170	40.0	12	4.93	14.0	288.15	0.024	0.015	0.72 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #4	542.402	7212.200	40.0	12	4.93	14.0	288.15	0.024	0.015	0.72 ³	0.38	1.77E-04 ²	3.54E-06 ²
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
Casthouse Furnace #2	541.816	7211.866	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 Emission rates transmitted in the email from Michael Palazzolo to Joe Scire dated June 13, 2006.

3 SO₂ emission rate based on 1.8% sulfur in baked anode [$1.2\text{g/s} \times (1.8\%/3.0\%) = 0.72\text{g/s}$].

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario E'¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.59	0.395	1.46 ²	0.29	2.14E-03	2.14E-05
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.59	0.395	1.46 ²	0.29	2.14E-03	2.14E-05

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 SO₂ emission rate based on 1.8% sulfur in baked anode.

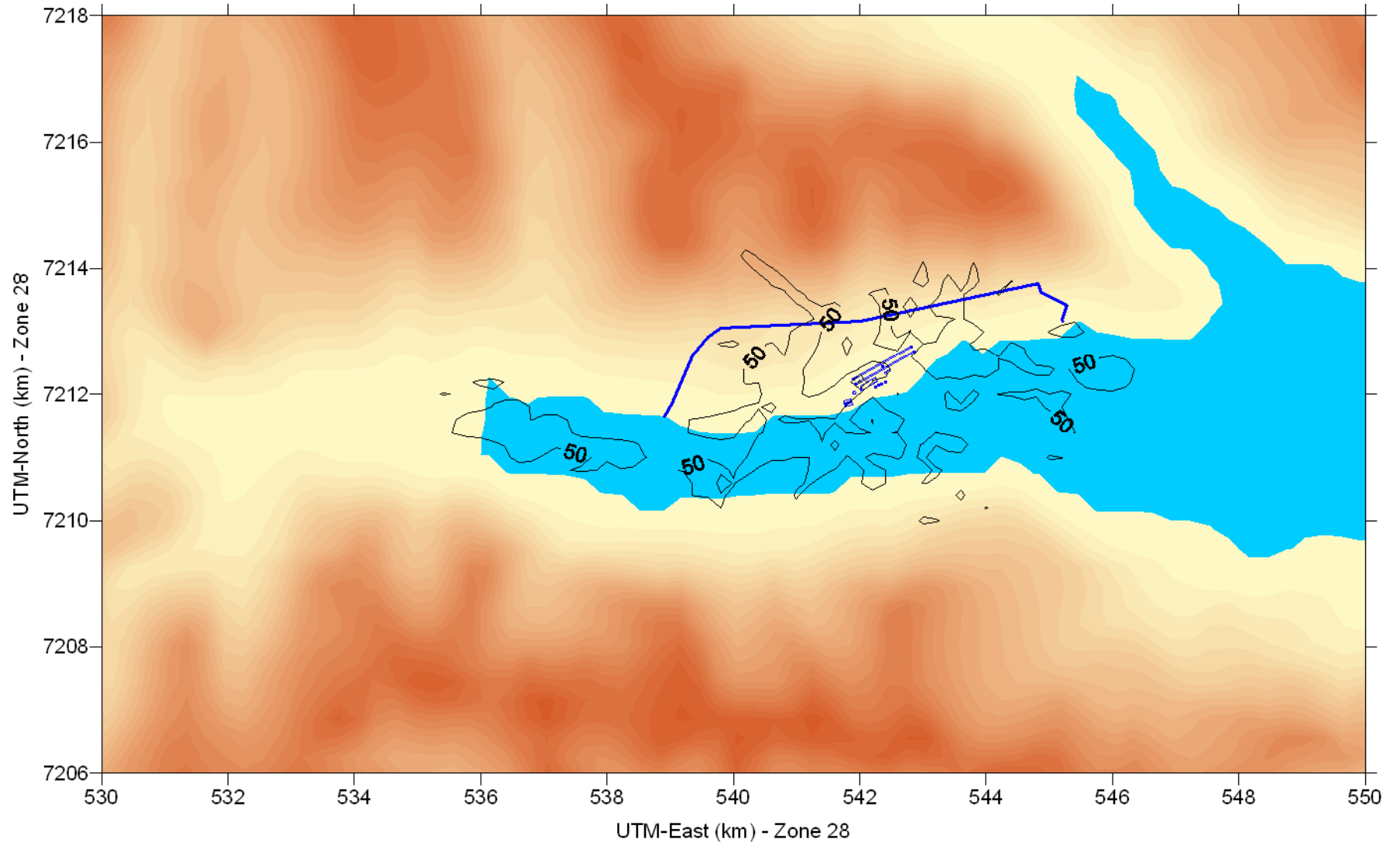
Table 8-2. Summary of CALPUFF Modeling Results for Scenario E'

Parameter	Averaging Period	Limit Value ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed ¹	Number of Exceedances Predicted ¹	In Compliance?
SO ₂	1-hour	350	24	0	Yes
	24- consecutive hours	50	7	0	Yes
	Winter season (October 1- March 31)	125	3	0	Yes
	Annual	20	0	0	Yes

¹ Maximum number of exceedances at any receptor outside the dilution zone.

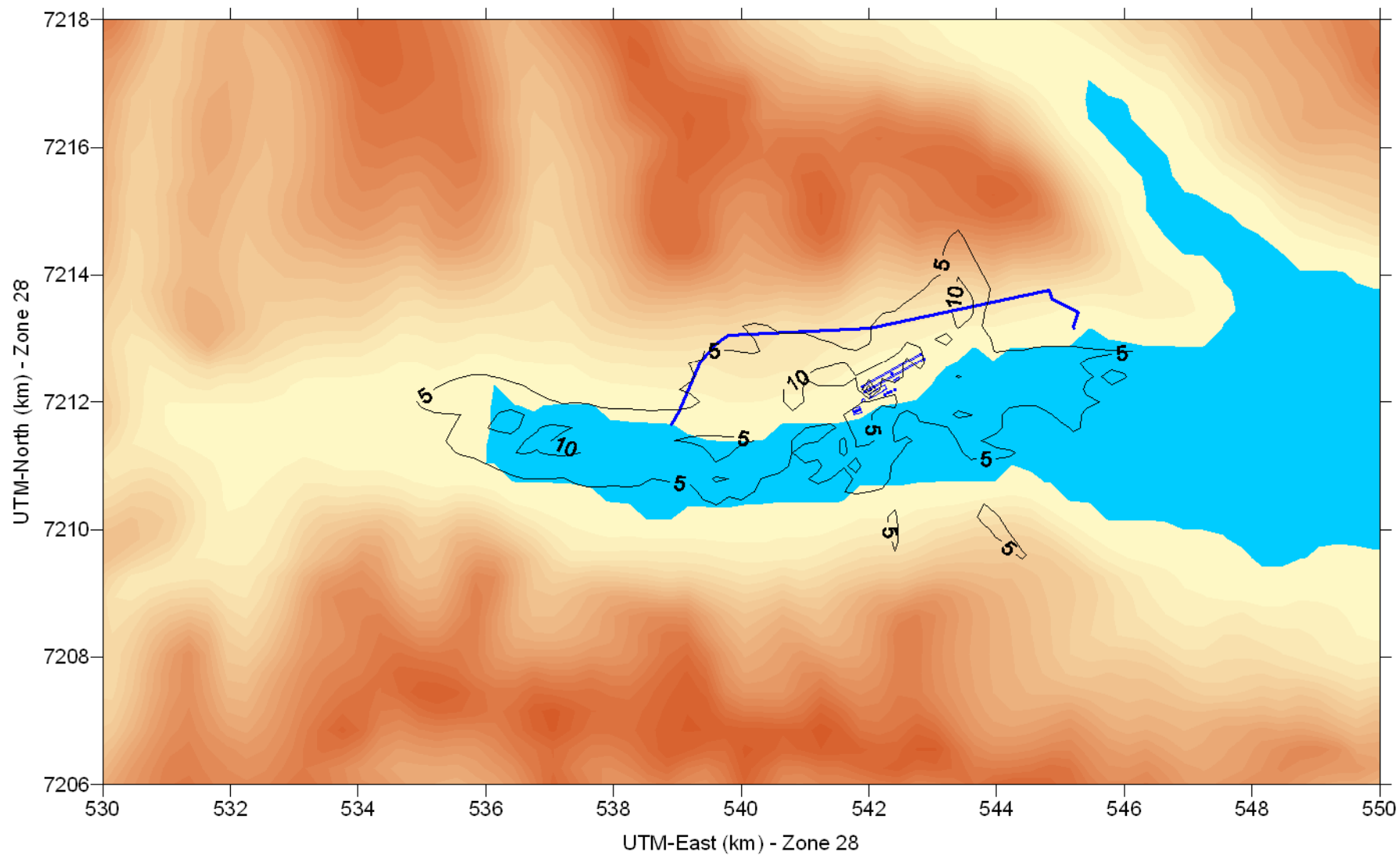
Scenario E'

SO2 1hr (ug/m^3)



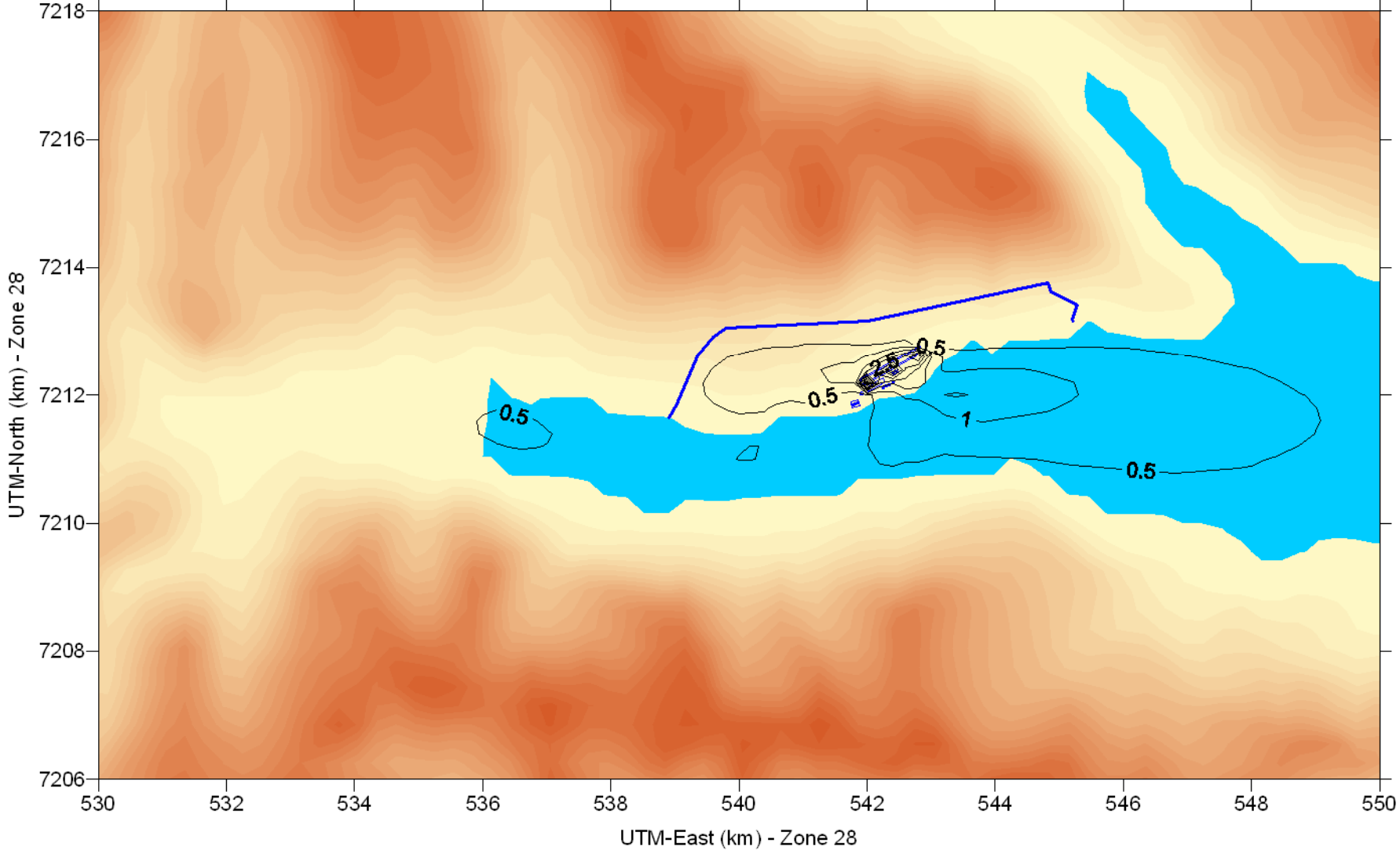
Scenario E'

SO2 24hr (ug/m^3)



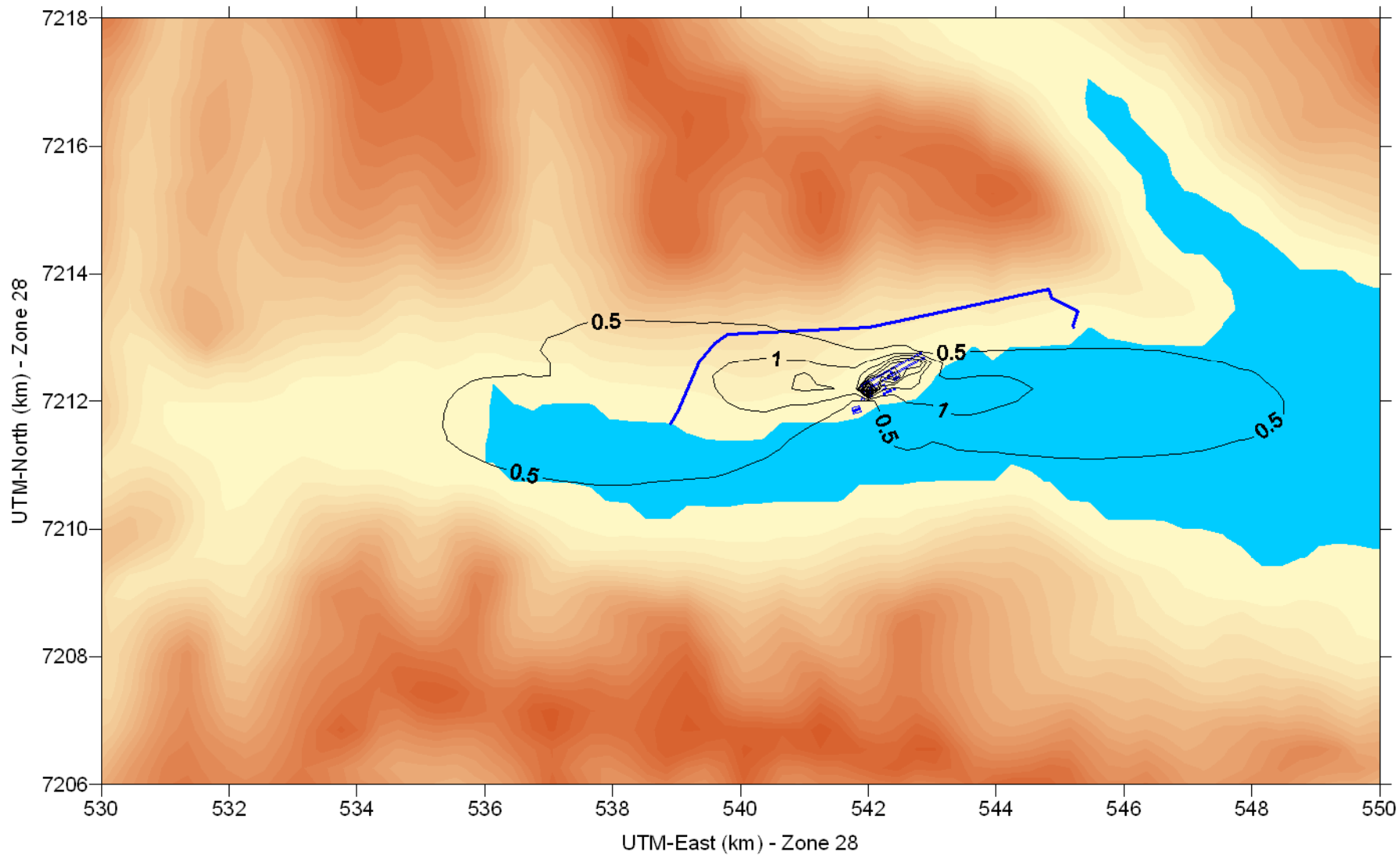
Scenario E'

SO2 Winter Season [October 2000 - March 2001] ($\mu\text{g}/\text{m}^3$)



Scenario E'

SO2 Annual (ug/m^3)



SCENARIO F: WITH Seawater Scrubbers – Anode Cooling to SWS – Growing Season Fluoride Emissions

Table 2-1. Point Source Parameters and Emission Rates – Scenario F¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)
Seawater Scrubber #1	542.246	7212.111	40.0	12	4.93	14.0	288.15	0.024	0.015
Seawater Scrubber #2	542.298	7212.141	40.0	12	4.93	14.0	288.15	0.024	0.015
Seawater Scrubber #3	542.350	7212.170	40.0	12	4.93	14.0	288.15	0.024	0.015
Seawater Scrubber #4	542.402	7212.200	40.0	12	4.93	14.0	288.15	0.024	0.015
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0
Casthouse Furnace #2	541.816	7211.866	29.5	12	0.8	12.0	553.15	0	0
Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0

¹ Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Grow Season Anode Cool to Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario F¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.76	0.505
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.76	0.505

¹ Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Grow Season Anode Cool to Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

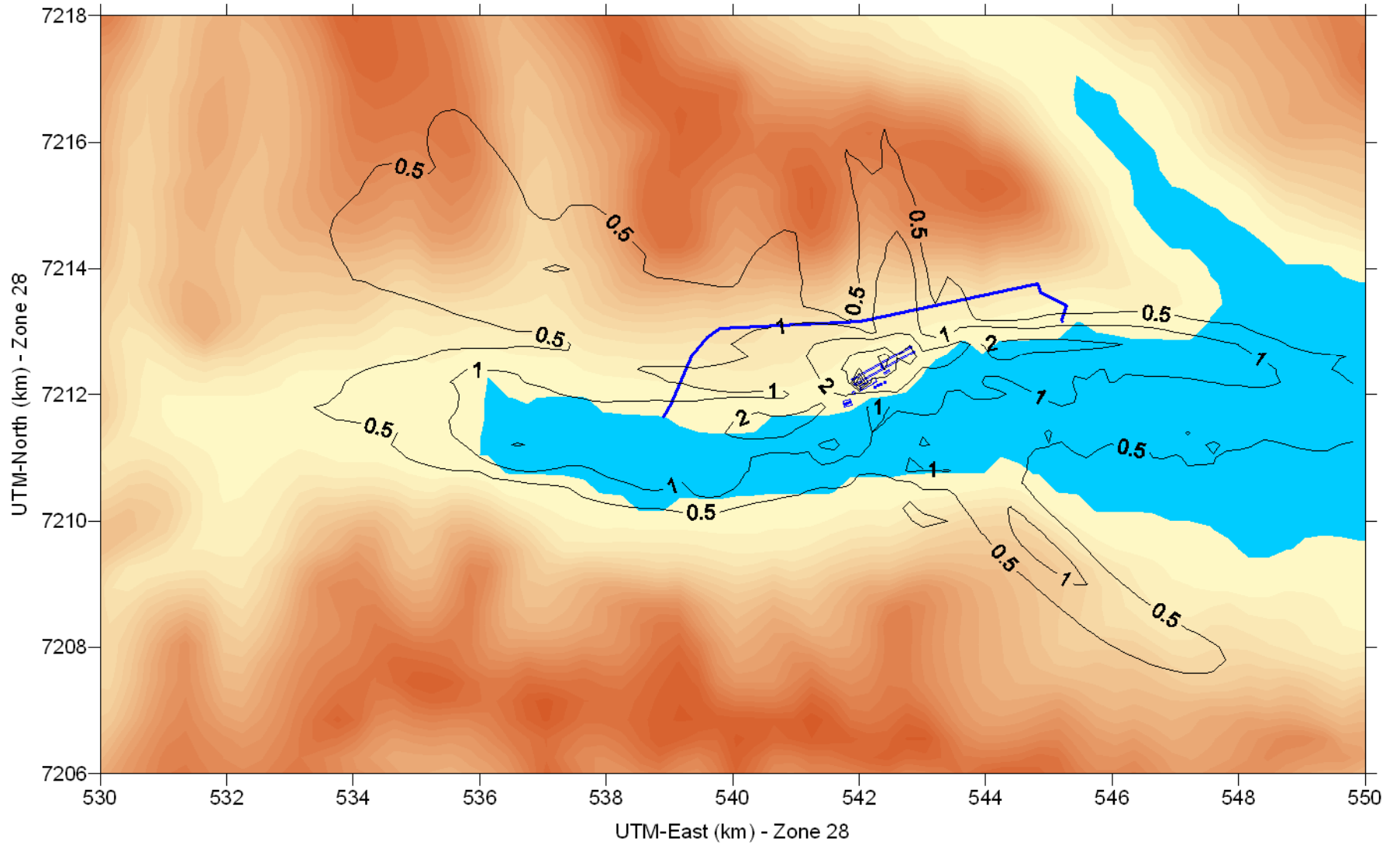
Table 8-3. Summary of CALPUFF Modeling Results for Scenario F

Parameter	Averaging Period	Limit Value ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed ¹	Number of Exceedances Predicted ¹	In Compliance?
HF	24-consecutive hours (April 1 – September 30)	25	0	0	Yes
	Growing season (April 1 – September 30)	0.3	0	0	Yes

¹ Maximum number of exceedances at any receptor outside the dilution zone or over water.

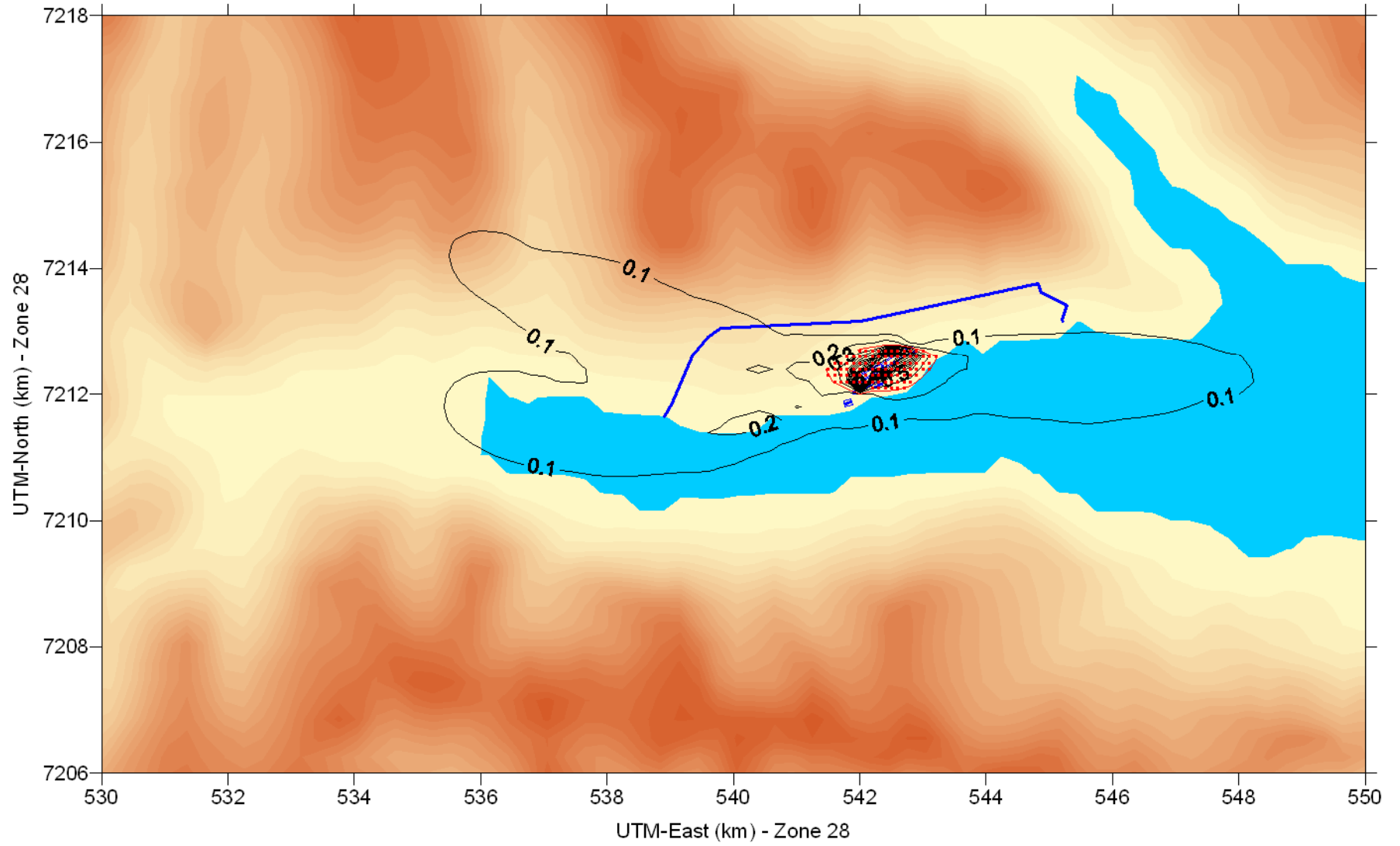
Scenario F

HF 24hr [Growing Season: 7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)



Scenario F

HF Growing Season [7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)



SCENARIO G: WITH Seawater Scrubbers – Anode Cooling to GTC to SWS – Annual Fluoride Emissions – 3.0% S

Table 2-1. Point Source Parameters and Emission Rates – Scenario G¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Seawater Scrubber #1	542.246	7212.111	40.0	12	4.93	14.0	288.15	0.020	0.015	1.2 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #2	542.298	7212.141	40.0	12	4.93	14.0	288.15	0.020	0.015	1.2 ³	0.38	1.77E-04 ²	3.54E-06 ²
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Seawater Scrubber #4	542.402	7212.200	40.0	12	4.93	14.0	288.15	0.020	0.015	1.2 ³	0.38	1.77E-04 ²	3.54E-06 ²
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
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Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to GTC&Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 Emission rates transmitted in the email from Michael Palazzolo to Joe Scire dated June 13, 2006.

3 SO₂ emission rate based on 3.0 % sulfur in baked anode.

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario G¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.59	0.395	2.43 ²	0.29	2.14E-03	2.14E-05
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.59	0.395	2.43 ²	0.29	2.14E-03	2.14E-05

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to GTC&Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 SO₂ emission rate based on 3.0% sulfur in baked anode.

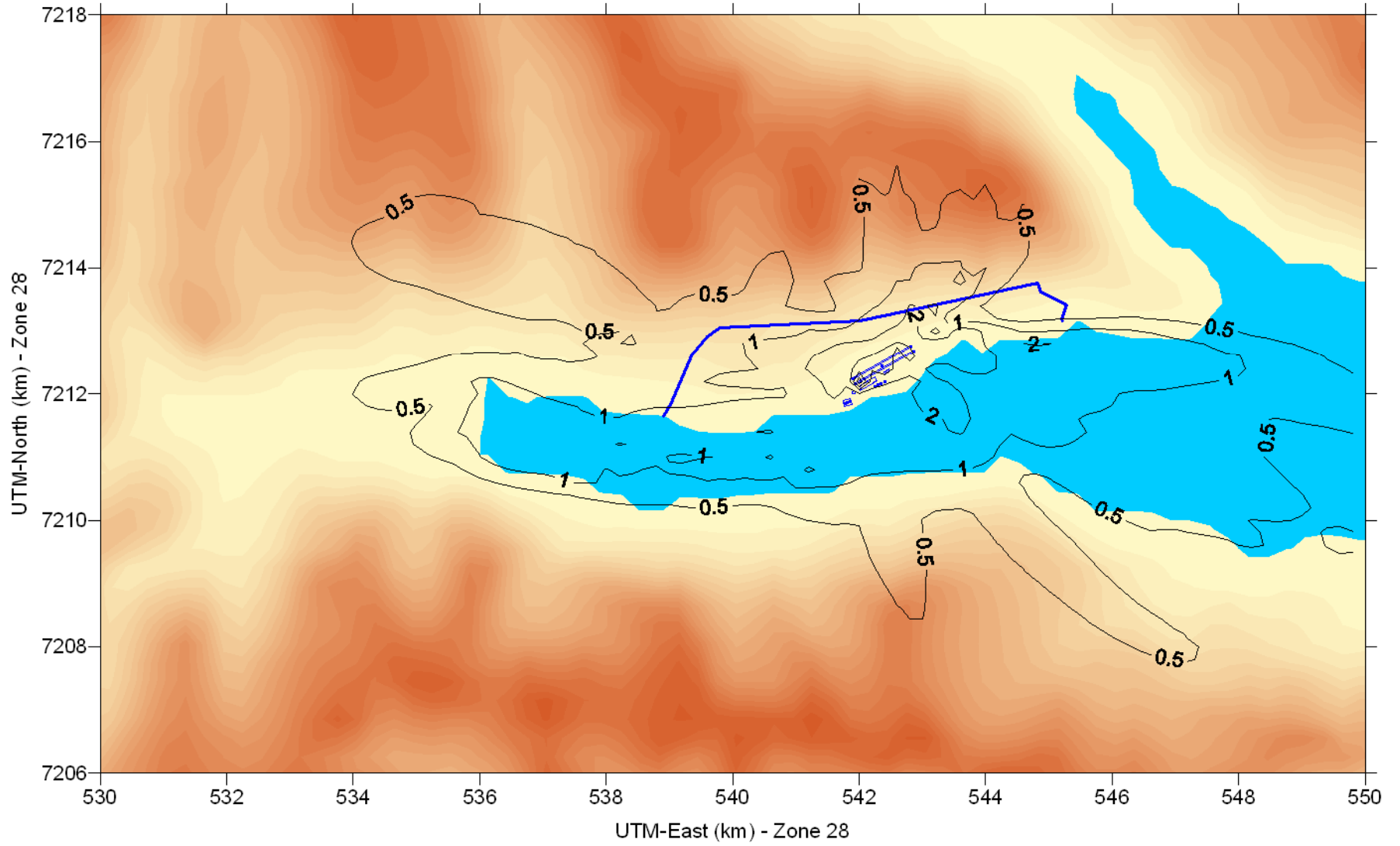
Table 8-3. Summary of CALPUFF Modeling Results for Scenario G

Parameter	Averaging Period	Limit Value ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed ¹	Number of Exceedances Predicted ¹	In Compliance?
HF	24-consecutive hours (April 1 – September 30)	25	0	0	Yes
	Growing season (April 1 – September 30)	0.3	0	0	Yes

¹ Maximum number of exceedances at any receptor outside the dilution zone.

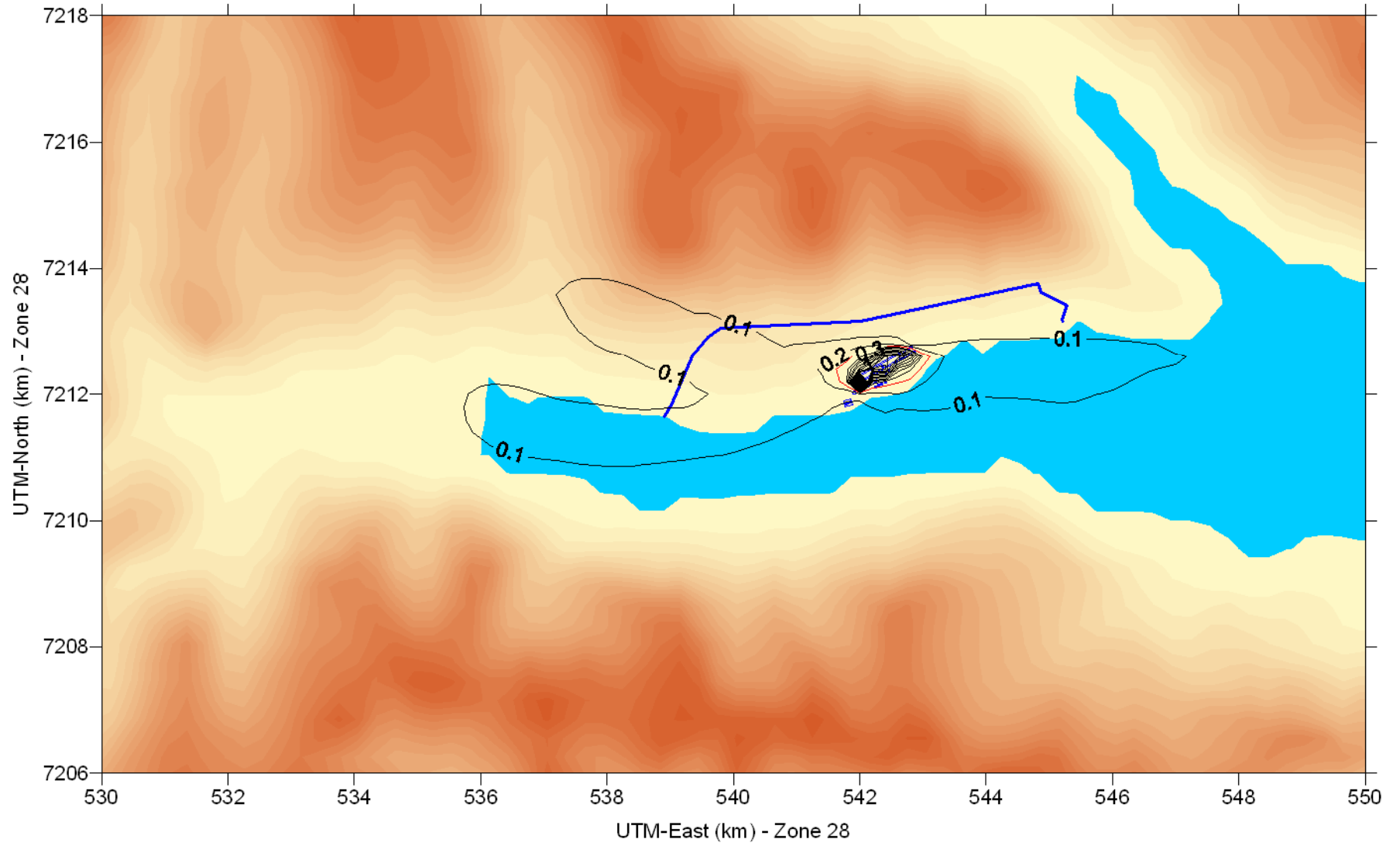
Scenario G

HF 24hr (ug/m³)



Scenario G

HF Growing Season [7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)



SCENARIO G': WITH Seawater Scrubbers – Anode Cooling to GTC to SWS – Annual Fluoride Emissions – 1.8% S

Table 2-1. Point Source Parameters and Emission Rates – Scenario G'¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Seawater Scrubber #1	542.246	7212.111	40.0	12	4.93	14.0	288.15	0.020	0.015	0.72 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #2	542.298	7212.141	40.0	12	4.93	14.0	288.15	0.020	0.015	0.72 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #3	542.350	7212.170	40.0	12	4.93	14.0	288.15	0.020	0.015	0.72 ³	0.38	1.77E-04 ²	3.54E-06 ²
Seawater Scrubber #4	542.402	7212.200	40.0	12	4.93	14.0	288.15	0.020	0.015	0.72 ³	0.38	1.77E-04 ²	3.54E-06 ²
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
Casthouse Furnace #2	541.816	7211.866	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to GTC&Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 Emission rates transmitted in the email from Michael Palazzolo to Joe Scire dated June 13, 2006.

3 SO₂ emission rate based on 1.8 % sulfur in baked anode [1.2g/s x (1.8%/3.0%) = 0.72g/s].

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario G'¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.59	0.395	1.46 ²	0.29	2.14E-03	2.14E-05
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.59	0.395	1.46 ²	0.29	2.14E-03	2.14E-05

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to GTC&Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 SO₂ emission rate based on 1.8% sulfur in baked anode.

Scenario G ' SO₂ Results → See Scenario E'

Note:

The only difference between Scenario E and Scenario G is a decrease in the HF emission rate from the Seawater Scrubber Stacks → SO₂ is unchanged between Scenario E and G and so the SO₂ results in Scenario E' and Scenario G' are identical.

SCENARIO H: WITH Seawater Scrubbers – Anode Cooling to GTC to SWS – Growing Season Fluoride Emissions

Table 2-1. Point Source Parameters and Emission Rates – Scenario H¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)
Seawater Scrubber #1	542.246	7212.111	40.0	12	4.93	14.0	288.15	0.020	0.015
Seawater Scrubber #2	542.298	7212.141	40.0	12	4.93	14.0	288.15	0.020	0.015
Seawater Scrubber #3	542.350	7212.170	40.0	12	4.93	14.0	288.15	0.020	0.015
Seawater Scrubber #4	542.402	7212.200	40.0	12	4.93	14.0	288.15	0.020	0.015
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0
Casthouse Furnace #2	541.816	7211.866	29.5	12	0.8	12.0	553.15	0	0
Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0

¹ Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Grow Season An Cool to GTC&Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario H¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.76	0.505
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.76	0.505

¹ Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Grow Season An Cool to GTC&Wet") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

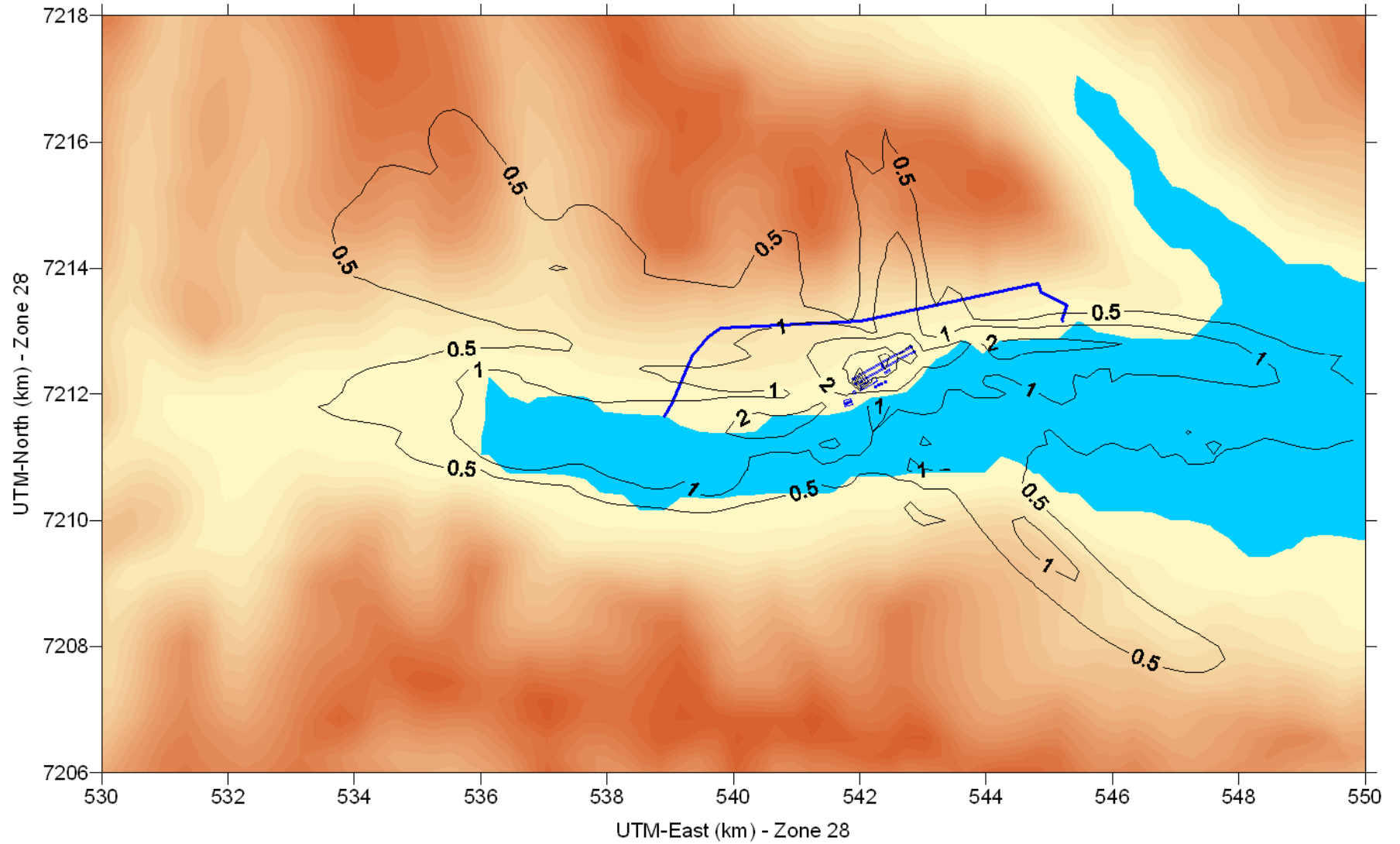
Table 8-3. Summary of CALPUFF Modeling Results for Scenario H

Parameter	Averaging Period	Limit Value ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed ¹	Number of Exceedances Predicted ¹	In Compliance?
HF	24-consecutive hours (April 1 – September 30)	25	0	0	Yes
	Growing season (April 1 – September 30)	0.3	0	0	Yes

¹ Maximum number of exceedances at any receptor outside the dilution zone.

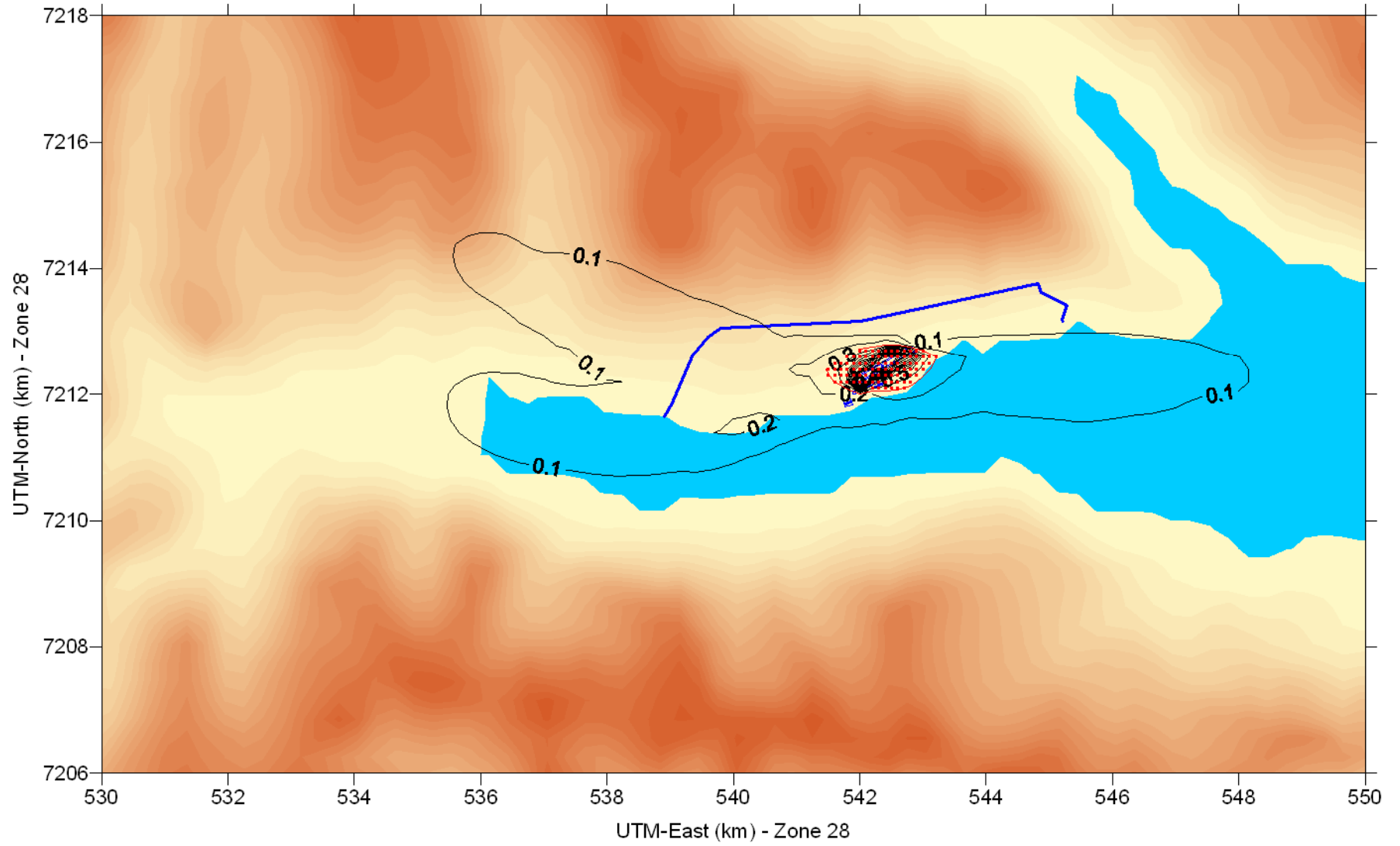
Scenario H

HF 24hr [Growing Season: 7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)



Scenario H

HF Growing Season [7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)



SCENARIO I: NO Seawater Scrubbers – Anode Cooling to GTC – Annual Fluoride Emissions – 1.8% S

Table 2-1. Point Source Parameters and Emission Rates – Scenario I¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Fume Treatment and Anode Cooling	542.366	7212.451	78.0	14	9.45	19.0	362.15	0.78	0.086	142.8 ³	2.16	1.41E-03	2.81E-05
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
Casthouse Furnace #2	541.816	7211.866	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0
Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0	0 ²	0.05	0	0

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to GTC Only") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 Emission rates transmitted in the email from Michael Palazzolo to Joe Scire dated June 13, 2006.

3 SO₂ emission rate based on 1.8% sulfur in baked anode.

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario I¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)	SO ₂ Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	PAH Emission Rate (g/s)	BaP Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.59	0.395	1.46 ²	0.29	2.14E-03	2.14E-05
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.59	0.395	1.46 ²	0.29	2.14E-03	2.14E-05

1 Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Anode Cool to GTC Only") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

2 SO₂ emission rate based on 1.8% sulfur in baked anode.

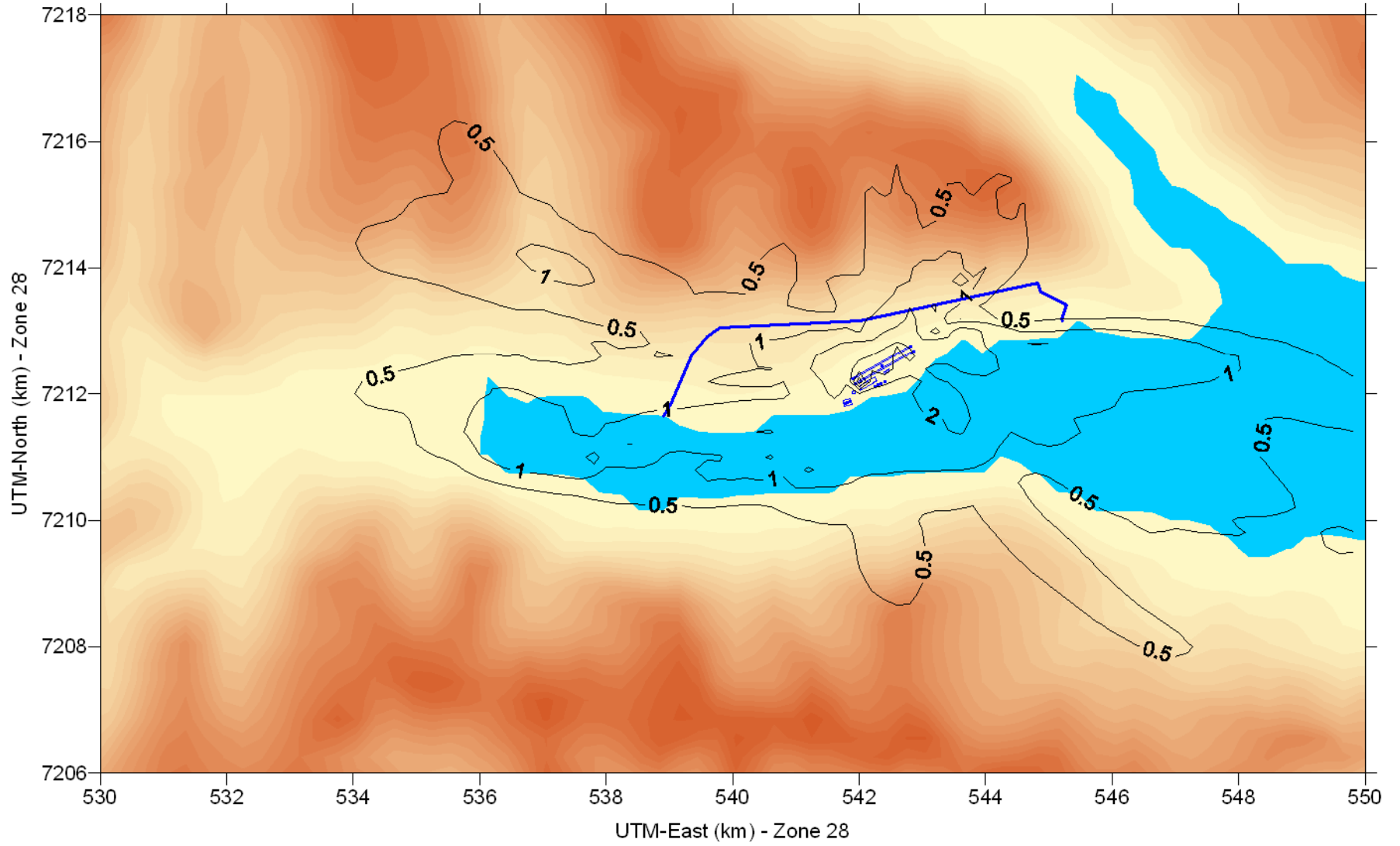
Table 8-3. Summary of CALPUFF Modeling Results for Scenario I

Parameter	Averaging Period	Limit Value ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed ¹	Number of Exceedances Predicted ¹	In Compliance?
HF	24-consecutive hours (April 1 – September 30)	25	0	0	Yes
	Growing season (April 1 – September 30)	0.3	0	0	Yes

¹ Maximum number of exceedances at any receptor outside the dilution zone.

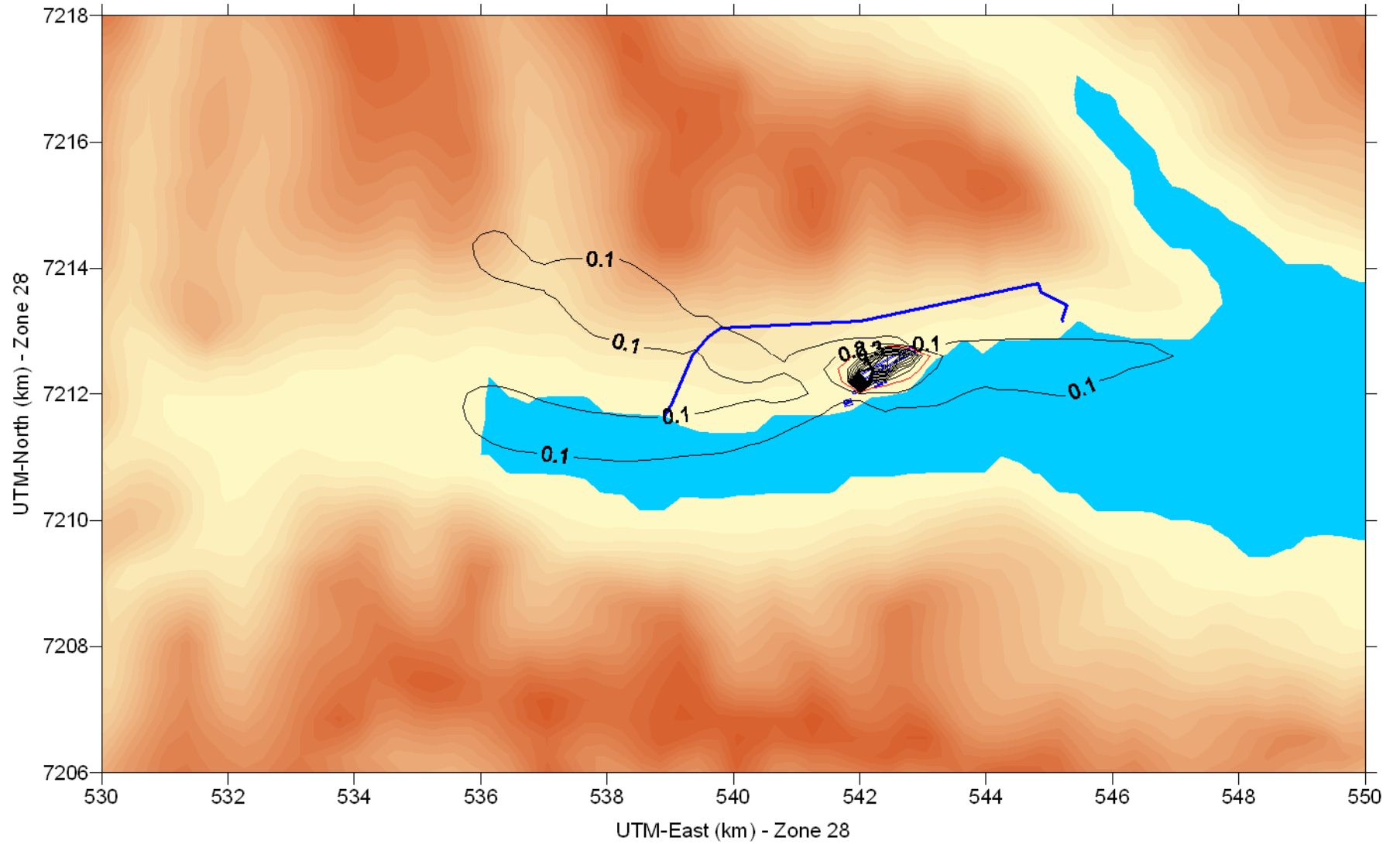
Scenario I

HF 24hr (ug/m³)



Scenario I

HF Growing Season [7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)



SCENARIO J: NO Seawater Scrubbers – Anode Cooling to GTC – Growing Season Fluoride Emissions

Table 2-1. Point Source Parameters and Emission Rates – Scenario J¹

Source Description	UTM 28 X-Coord. (km)	UTM 28 Y-Coord. (km)	Stack Height (m)	Base Elev. (m)	Stack Diam. (m)	Exit Veloc. (m/s)	Exit Temp. (K)	HF Emission Rate (g/s)	PF Emission Rate (g/s)
Fume Treatment and Anode Cooling	542.366	7212.451	78.0	14	9.45	19.0	362.15	0.78	0.086
Casthouse Furnace #1	541.776	7211.855	29.5	12	0.8	12.0	553.15	0	0
Casthouse Furnace #2	541.816	7211.866	29.5	12	0.8	12.0	553.15	0	0
Casthouse Furnace #3	541.856	7211.878	29.5	12	0.8	12.0	553.15	0	0

¹ Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Grow Season Anode Cool to GTC") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

Table 2-2. Line Source (Potroom) Parameters and Emission Rates – Scenario J¹

Source Description	Line Number	UTM 28 X-Coord. Begin (km)	UTM 28 Y-Coord. Begin (km)	UTM 28 X-Coord. End (km)	UTM 28 Y-Coord. End (km)	Release Height (m)	Base Elev. (m)	HF Emission Rate (g/s)	PF Emission Rate (g/s)
Potline Roof #1	1	541.899	7212.247	542.815	7212.762	22.5	14	0.76	0.505
Potline Roof #2	2	541.943	7212.168	542.859	7212.683	22.5	14	0.76	0.505

¹ Emissions data is from spreadsheet "Model_campgn_5.xls" (Sheet "Grow Season Anode Cool to GTC") transmitted in the email from Michael Palazzolo to Joe Scire dated May 30, 2006.

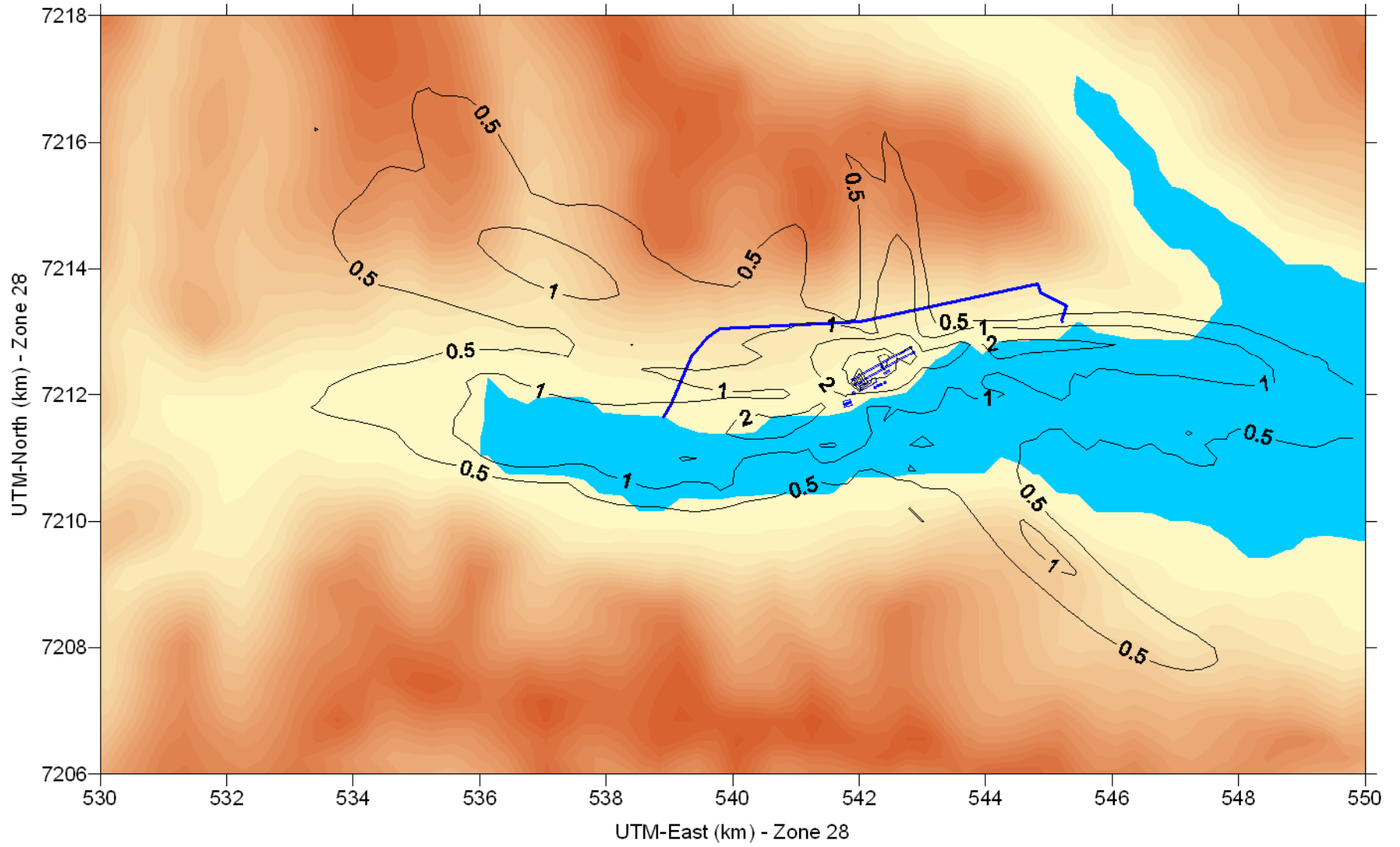
Table 8-3. Summary of CALPUFF Modeling Results for Scenario J

Parameter	Averaging Period	Limit Value ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed ¹	Number of Exceedances Predicted ¹	In Compliance?
HF	24-consecutive hours (April 1 – September 30)	25	0	0	Yes
	Growing season (April 1 – September 30)	0.3	0	0	Yes

¹ Maximum number of exceedances at any receptor outside the dilution zone.

Scenario J

HF 24hr [Growing Season: 7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)



Scenario J

HF Growing Season [7/1/00-9/30/00 & 4/1/01-6/30/01] ($\mu\text{g}/\text{m}^3$)

