

APPENDIX N PUBLIC COMMUNICATIONS



Wisconsin Public Service Corporation

An Integrys Energy Group Company

700 North Adams Street

P.O. Box 19001

Green Bay, WI 54307-9001

www.wisconsinpublicservice.com

Dear

You're invited!

As you may have heard, Wisconsin Public Service (WPS) is considering adding an electric generating unit to the existing Fox Energy Center. As a neighbor of the facility or an interested community official, WPS is offering you an opportunity to hear about the project and provide your feedback.

WPS anticipates a need for additional electricity by 2019. It is looking at two options: buying the power from another energy supplier or building a new generating unit. Last year, the company announced that if it determined that building was the best option for customers, Fox Energy Center was the preferred site. So, while we are still weighing our options whether to build or buy, we do want to move ahead and gather input from neighbors should the build option be selected.

WPS invites you to attend an open house meeting Wednesday May 21, 2014 to speak with members of the WPS project team. You will be able to view and give your feedback on potential design and placement of a new generator on the property. There will also be large maps of the proposed route being considered for a natural gas pipeline needed for a new unit. We'll have individuals that are experts available that can answer your questions about the proposed project.

There will be two sessions. Refreshments will be available.

Where:	Van Abel's of Hollandtown 8108 County Road D, Kaukauna, WI 54130
When:	May 21, 2014 Doors open at 2:00 P.M. and 6:30 P.M. Brief presentations at 2:30 P.M. and 7:00 P.M. Meeting rooms close by 4:00 P.M. and 8:30 P.M.

I have enclosed a postage-paid postcard for you to return indicating if you and others plan to attend, and if so, which session. We hope to see you there!

Sincerely,

Kerry Spees
Project Communications Coordinator



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An Integrys Energy Group Company

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P.O. Box 19001
Green Bay, WI 54307-9001

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<Name, Address>

Dear <Name>

You're invited!

As you may have heard, Wisconsin Public Service (WPS) is considering adding an electric generating unit to the existing Fox Energy Center. As a neighbor of the facility who is also located along the proposed route of a natural gas pipeline needed to serve a new generator, WPS is offering you an opportunity to hear about the project and provide your feedback.

WPS anticipates a need for additional electricity by 2019. It is looking at two options: buying the power from another energy supplier or building a new generating unit. Last year, the company announced that if it determined that building was the best option for customers, Fox Energy Center was the preferred site. So, while we are still weighing our options whether to build or buy, we do want to move ahead and gather input from neighbors should the build option be selected.

WPS invites you to attend an open house meeting Wednesday May 21, 2014 to speak with members of the WPS project team. You will be able view and give your feedback on potential design and placement of a new generator on the property. There will also be large maps of the proposed route being considered for the gas pipeline. We'll have experts available to answer your questions about the proposed project.

There will be two sessions. Refreshments will be available.

Where:	Van Abel's of Hollandtown 8108 County Road D, Kaukauna, WI 54130
When:	May 21, 2014 Doors open at 2:00 P.M. and 6:30 P.M. Brief presentations at 2:30 P.M. and 7:00 P.M. Meeting rooms close by 4:00 P.M. and 8:30 P.M.

I have enclosed a map of route options for the gas line, as well as a postage-paid postcard for you to return indicating if you and others plan to attend, and if so, to which session. We hope to see you there!

Sincerely,

Kerry Spees
Project Communications Coordinator



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An Integrys Energy Group Company

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<Name, Address>

Dear <Name>

You're invited!

As you may have heard, Wisconsin Public Service (WPS) is considering adding an electric generating unit to the existing Fox Energy Center. As a landowner who is located along the proposed route of a natural gas pipeline needed to serve a new generator, WPS is offering you an opportunity to hear about the project and provide your feedback.

WPS anticipates a need for additional electricity by 2019. It is looking at two options: buying the power from another energy supplier or building a new generating unit. Last year, the company announced that if it determined that building was the best option for customers, Fox Energy Center was the preferred site. So, while we are still weighing our options whether to build or buy, we do want to move ahead and gather input from neighbors should the build option be selected.

WPS invites you to attend an open house meeting Wednesday May 21, 2014 to speak with members of the WPS project team. You will be able view and give your feedback on potential design and placement of a new generator on the property. There will also be large maps of the route being considered for the natural gas pipeline. We'll have experts on the process available to answer your questions.

There will be two sessions. Refreshments will be available.

Where:	Van Abel's of Hollandtown 8108 County Road D, Kaukauna, WI 54130
When:	May 21, 2014 Doors open at 2:00 P.M. and 6:30 P.M. Brief presentations at 2:30 P.M. and 7:00 P.M. Meeting rooms close by 4:00 P.M. and 8:30 P.M.

I enclosed a map of the proposed route map for the gas line, as well as a postage-paid postcard for you to return indicating if you and others plan to attend, and if so, to which session. See you there!

Sincerely,

Kerry Spees
Project Communications Coordinator



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An Integrys Energy Group Company

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P.O. Box 19001
Green Bay, WI 54307-9001

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<Name, Address>

Dear <Name>

A short while ago, WPS sent you a letter updating its progress on the decision to buy needed power or add a generator to the Fox Energy Center. After months of preliminary design and review of a number of “build or buy” options, WPS has determined that it is in our customers best interest to add an electric generating unit to the Fox Energy Center site. WPS will seek Commission approval for the project early in 2015. If approved, construction of the new generator would be completed by 2019. The potential merger between Integrys Energy Group and Wisconsin Energy Corporation is not expected to impact this project.

However, WPS has determined that a new natural gas pipeline through your property is not needed for the proposed project .

We will hold another public meeting to talk about the project. There will be two sessions. Refreshments will be available. Here are the details. Feel free to attend if you like.

Where:	The MARQ 3177 French Road De Pere, WI 54115
When:	Monday December 1, 2014 Doors open at 2:00 P.M. and 6:30 P.M. Brief presentations at 2:30 P.M. and 7:00 P.M. Meeting rooms close by 4:00 P.M. and 8:30 P.M.

WPS will share its final design of the proposed unit based on both the company’s analysis and your prior feedback. We listened. And incorporated many of your thoughts into the design of Fox 3.

This meeting will be formatted much like our first meeting – with maps and other visual aids at several tables, several company experts to give you information and take further feedback from you, and a 15-20 minute presentation of the design of the proposed new generator. The presentation will include the proposed physical layout of the unit, sound and lighting, project timeline and many other issues.

We hope to see you there!

Sincerely,

Kerry Spees
Project Communications Coordinator

PSC Code	Business Contact (Name)	Name of Business or Private Citizen	Primary Mailing Address or PO Box	Secondary Address (Street Address)	City	State	Zip	Sort (Last Name or Business Name - see Column C)	Email	PSC Code
X		AHMAN R GREEN AND EDWARD & GLENDA SCOTT	1750 LIMESTONE TRAIL		DE PERE	WI	54115	GREEN		X
X		ALAN D & TERESA M FRANCIS	W710 RIVER BEND DRIVE		KAUKAUNA	WI	54130	FRANCIS		X
X		ANCHORBANK FSB	25 W MAIN STREET		MADISON	WI	53703	ANCHORBANK		X
X		ANN K BOWERS	W215 DEERING LANE		KAUKAUNA	WI	54130	BOWERS		X
X		ARLIE D ALLEN	272 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	ALLEN		X
X		TUNDRALAND HOME IMPROVEMENTS	N2277 WEST FRONTAGE ROAD		KAUKAUNA	WI	54130	BEASTER INVESTMENTS		X
X		BENJAMIN M & KRISTA A SCHROTH	460 GORDON WAY		WRIGHTSTOWN	WI	54180	SCHROTH		X
X		BERNARD & ELEANOR BOWERS	336 MAIN STREET		WRIGHTSTOWN	WI	54180	BOWERS		X
X		BLANCHE A KERRIGAN MARITAL TRUST	312 E FOURTEENTH ST APT 322		KAUKAUNA	WI	54130	KERRIGAN		X
X		BONI L GRODE	W896 RIVER FOREST DRIVE		KAUKAUNA	WI	54130	GRODE		X
X		BRANDON K HOOYMAN	N2672 DELLA MARCUS DRIVE		KAUKAUNA	WI	54130	HOOYMAN		X
X		BRIAN J & SARAH C DAY	549 PECKHAM STREET		NEENAH	WI	54956	DAY		X
X		BRUCE A & PAULA A HOHOL	736 WASHINGTON STREET		WRIGHTSTOWN	WI	54180	HOHOL		X
X		BRUCE P & SUSAN P BISHOP	254 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	BISHOP		X
X		BUDS FARM LLC	336 MAIN STREET		WRIGHTSTOWN	WI	54180	BUDS FARM		X
X		CALMES CONSTRUCTION PROPERTIES	N2193 BODDE ROAD		KAUKAUNA	WI	54130	CALMES		X
X		CALMES FAMILY PROPERTIES LLC	N2241 BODDE ROAD		KAUKAUNA	WI	54130	CALMES		X
X		CARL M & EDWINA M WHITT	186 GOLF COURSE DRIVE		WRIGHTSTOWN	WI	54180	WHITT		X
X		CAROL A BURCH	POBOX 5164		DE PERE	WI	54115	BURCH		X
X		CAROL M EDERER IRREVOCABLE REAL ESTATE TRUST	W593 STATE ROAD 96		KAUKAUNA	WI	54130	EDERER		X
X		CASEY D SCHWANDT	509 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	SCHWANDT		X
X		CASK HOLDINGS LLC	N2570 MCCABE ROAD		KAUKAUNA	WI	54130	CASK HOLDINGS		X
X		CEI LAND DEVELOPMENT LLC	POBOX 12057		GREEN BAY	WI	54307	CEI LAND DEVELOPMENT		X
X		CHRIS G & JULIE A KILSDONK	271 PADDY COURT		WRIGHTSTOWN	WI	54180	KILSDONK		X
X		CHRISTOPHER L KILGAS	633 BOWERS LANE		KAUKAUNA	WI	54130	KILGAS		X
X		CINDY J LASHOCK & MARK T HILLESHEIM	436 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	HILLESHEIM		X
X		CINDY S HOCK	209 FORT HOWARD AVE #9		DE PERE	WI	54115	HOCK		X
X		CITY OF KAUKAUNA (JEFF FELDT)	PO BOX 1777		KAUKAUNA	WI	54130	CITY OF KAUKAUNA	jfeldt@ku-wi.org	X
X		CLIFF D & KRISTINA HAVERKORN	612 LINDSVIEW COURT		WRIGHTSTOWN	WI	54180	HAVERKORN		X
X		CORBIN M OTTO	W493 CINDY ANN LANE		KAUKAUNA	WI	54130	OTTO		X
X		COUSINEAU REVOCABLE TRUST	N2090 SHAWN COURT		KAUKAUNA	WI	54130	COUSINEAU		X
X		DALE & MURIEL VANZEELAND JOINT REVOCABLE TRUST	W653 RIVER BEND DRIVE		KAUKAUNA	WI	54130	VANZEELAND		X
X		DANIEL F & SUE A HURLEY	230 THEUNIS DRIVE		WRIGHTSTOWN	WI	54180	HURLEY		X
X		DANIEL J & EMILY KETTENHOFEN	568 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	KETTENHOFEN		X
X		DANIEL L & LINDA M CAMPBELL	245 THEUNIS DRIVE		WRIGHTSTOWN	WI	54180	CAMPBELL		X
X		DANIEL & DENISE ZWICK	W303 GOLF COURSE DRIVE		WRIGHTSTOWN	WI	54180	ZWICK		X
X		DANIEL R SPRANGERS	W441 CINDY ANN LANE		KAUKAUNA	WI	54130	SPRANGERS		X
X		DANIELLE R WALKER	344 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	WALKER		X
X		DANNY L & MARICI A AWE	W669 RIVERVIEW COURT		KAUKAUNA	WI	54130	AWE		X
X		DARRYL G SCHROEDER	174 GOLF COURSE DRIVE		WRIGHTSTOWN	WI	54180	SCHROEDER		X
X		DAVID & DIANE LECAPITIANE	N2183 TOWN CLUB ROAD		KAUKAUNA	WI	54130	LECAPITIANE		X
X		DAVID H & HOLLY PAUTZ	W615 DELLA MARCUS DRIVE		KAUKAUNA	WI	54130	PAUTZ		X
X		DAVID J & ANNE M VANLIESHOUT	221 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	VANLIESHOUT		X
X		DAVID J & DONNA M MURPHY	N1777 IVY LAND		GREENVILLE	WI	54942	MURPHY		X
X		DAVID J & DONNA M NENNIG	N2575 MCCABE ROAD		KAUKAUNA	WI	54130	NENNIG		X
X		DAVID S & KAY M QUELLA	W134 STATE ROAD 96		KAUKAUNA	WI	54130	QUELLA		X
X		DELLA MARCUS CORPORATION INC	P.O. BOX 24		LITTLE CHUTE	WI	54140	DELLA MARCUS CORPORATION		X
X		DENNIS A DEERING	W247 DEERING LANE		KAUKAUNA	WI	54130	DEERING		X
X		DENNIS H GLOUDEMANS	W621 DELLA MARCUS DRIVE		KAUKAUNA	WI	54130	GLOUDEMANS		X
X		DJR ENTERPRISES LLC	1704 SAVANNAH WAY		WAUNAKEE	WI	53597	DJR ENTERPRISES		X
X		DONALD & MARY N VANZEELAND	N2099 SHAWN COURT		KAUKAUNA	WI	54130	VANZEELAND		X
X		DOUGLAS J & ADRIANNE PETERSON	2732 BROOKHILLS DRIVE		GREEN BAY	WI	54313	PETERSON		X

PSC Code	Business Contact (Name)	Name of Business or Private Citizen	Primary Mailing Address or PO Box	Secondary Address (Street Address)	City	State	Zip	Sort (Last Name or Business Name - see Column C)	Email	PSC Code
X		DOUGLAS J & ROSEMARY F DUDEK	277 PADDY COURT		WRIGHTSTOWN	WI	54180	DUDEK		X
X		DUSTIN T & TABITHA L BURTON	W124 STATE ROAD 96		KAUKAUNA	WI	54130	BURTON		X
X		EDWARD C & CATHERINE GROH	W688 RIVER BEND DRIVE		KAUKAUNA	WI	54130	GROH		X
X		STANLEY WATKINS	N2617 MCCABE ROAD		KAUKAUNA	WI	54130	MULROY		X
X		ERIC T & JEAN A HILL	W224 DEERING LANE		KAUKAUNA	WI	54130	HILLESHEIM		X
X		ERIK J & BETH PLESS	1351 FINCH LANE		GREEN BAY	WI	54313	PLESS		X
X		ERIK M & ELIZABETH M MALUEG	4545 MILL ROAD		DENMARK	WI	54208	MALUEG		X
X		FOX VALLEY WOOD PRODUCTS INC	W811 STATE ROAD 96		KAUKAUNA	WI	54130	FOX VALLEY WOOD PRODUCTS		X
X		FRED K KREKOWSKI	N2358 EAST FRONTAGE ROAD		KAUKAUNA	WI	54130	KREKOWSKI		X
X		GEERTS REVOCABLE TRUST	235 W WISCONSIN AVE		KAUKAUNA	WI	54130	GEERTS		X
X		GEORGE & LINDA FICKAU	N239 DEERING LANE		KAUKAUNA	WI	54130	FICKAU	gfcikau@gmail.com	X
X		GERALD VAN CAMP	N2117 SHAWN COURT		KAUKAUNA	WI	54130	STORDAHL	givcent@hotmail.com	X
X		GERALD R DOMASZEK	520 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	DOMASZEK		X
X		GLEN A & HELENE DERKS	W180 STATE ROAD 96		KAUKAUNA	WI	54130	DERKS		X
X		GLENN & ANN IMMEL	W203 DEERING LANE		KAUKAUNA	WI	54130	IMMEL		X
X		GREGORY J GREINER	N4325 COUNTY ROAD E		FREEDOM	WI	54130	GREINER		X
X		HAROLD A & CARLA A REICHWALD	2609-1 BAY HARBOR CIRCLE		GREEN BAY	WI	54304	REICHWALD		X
X		HELEN M LENZ	705 W NINTH STREET		KAUKAUNA	WI	54130	LENZ		X
X		JAMES J CALMES	1150 LAUGHTON CIRCLE		FORT MEYERS	FL	33913	CALMES		X
X		JAMES KASSNER	2339 CEDAR RIDGE		GREEN BAY	WI	54313	KASSNER		X
X		JAMES M DOLAN	N2223 TOWN CLUB ROAD		KAUKAUNA	WI	54130	DOLAN		X
X		JAMES MILLER	W728 RIVER BEND DRIVE		KAUKAUNA	WI	54130	MILLER		X
X		JAMES R & SHEILA K ANIOL	9851 HIGHWAY 50		BATTLEVIEW	ND	58773	ANIOL		X
X		JAMES W & MARIANN H KASPER	W480 CINDY ANN LANE		KAUKAUNA	WI	54130	KASPER		X
X		JAMIE L & KARIN A GILSON	624 LINKSVIEW COURT		WRIGHTSTOWN	WI	54180	GILSON		X
X		JASON W GEREND & NICOLE M BETTER	W376 COUNTY ROAD ZZ		KAUKAUNA	WI	54130	GEREND	iwgerend@gmail.com	X
X		JEFF & KRISTA MOLITOR	1526 ELK TRAIL COURT		NEENAH	WI	54956	MOLITOR		X
X		JEFFREY A & RENEE A GYRION	W642 RIVER BEND DRIVE		KAUKAUNA	WI	54130	GYRION		X
X		JEFFREY E & JUDY J KOSTER	W468 CINDY ANN LANE		KAUKAUNA	WI	54130	KOSTER		X
X		JEFFREY G THEUNIS	200 LOCK ROAD		KAUKAUNA	WI	54130	THEUNIS		X
X		JEFFREY M & TRACY VANZEELAND	6658 RIDGE ROYALE DRIVE		GREENLEAF	WI	54126	VANZEELAND		X
X		JEFFREY T & CAROL J MEULEMANS	W733 RIVER BEND DRIVE		KAUKAUNA	WI	54130	MEULEMANS		X
X		JEREMY M & MICHELLE L KITTOE	469 GORDON WAY		WRIGHTSTOWN	WI	54180	KITTOE		X
X		JEROME E & ROXANN ONEILL	W766 RIVER BEND DRIVE		KAUKAUNA	WI	54130	ONEILL		X
X		JOE W & KELLI A SIMS	290 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	SIMS		X
X		JOHN A & VICKI L POWERS	514 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	POWERS		X
X		JOHN G & ELIZABETH L MARTIN	156 LOCK ROAD		KAUKAUNA	WI	54130	MARTIN		X
X		JOHN L & BARBARA J TETZLAFF	W737 RIVER BEND DRIVE		KAUKAUNA	WI	54130	TETZLAFF		X
X		JOHN L & MARY BARANOWSKI	445 GORDON WAY		WRIGHTSTOWN	WI	54180	BARANOWSKI		X
X		JOHN M & MARTHA A WOLLNER	569 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	WOLLNER	iwollner@new.rr.com	X
X		JOHN SCHREURS	6570 ELMRO ROAD		GREENLEAF	WI	54126	SCHREURS		X
X		JOHN W & KAREN A VANDERWALL	263 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	VANDERWALL		X
X		JOHN W & SHARON K WESTPHAL	274 PADDY COURT		WRIGHTSTOWN	WI	54180	WESTPHAL		X
X		JON HUSS	N2335 WEST FRONTAGE ROAD		KAUKAUNA	WI	54130	HUSS		X
X		JONATHAN B & AMY M FEHLAUER	W702 RIVER BEND DRIVE		KAUKAUNA	WI	54130	FEHLAUER		X
X		JONATHAN D WIESE	221 THEUNIS DRIVE		WRIGHTSTOWN	WI	54180	WIESE		X
X		JONATHAN M & DESIREE PETERSON	469 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	PETERSON		X
X		JOSEPH & STACI FERG	213 STROEBE ROAD		APPLETON	WI	54914	FERG		X
X		JOSEPH B STORINO	W788 WRIGHTSTOWN ROAD		KAUKAUNA	WI	54130	STORINO		X
X		JOSEPH BOS	N2424 EAST FRONTAGE ROAD		KAUKAUNA	WI	54130	BOS		X
X		JUDITH A LASKOWSKI	1975 RIDGEWAY DRIVE APT 34		DE PERE	WI	54115	LASKOWSKI		X
X		JUSTIN & AMY COLLINS	W755 STATE ROAD 96		KAUKAUNA	WI	54130	COLLINS		X

PSC Code	Business Contact (Name)	Name of Business or Private Citizen	Primary Mailing Address or PO Box	Secondary Address (Street Address)	City	State	Zip	Sort (Last Name or Business Name - see Column C)	Email	PSC Code
X		KEITH & SANDRA WENDLANDT LIVING TRUST	562 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	WENDLANDT	keithandsandra@new.rr.com	X
X		KENNETH & LORIE DEERING JOINT REVOCABLE TRUST	W745 RIVER BEND DRIVE		KAUKAUNA	WI	54130	DEERING		X
X		KENNETH S & MARY ANN ROHAN	W10148 STATE ROAD 76		BEAR CREEK	WI	54922	ROHAN		X
X		KENT R & KAREN J TURKOW JOINT REVOCABLE TRUST	1080 CORONADO COURT		ONEIDA	WI	54155	TURKOW		X
X		LARRY & VICKI GROSHENS	N2015 FARM VIEW ROAD		KAUKAUNA	WI	54130	GROSHENS		X
X		LAURA EMERY	W211 DEERING LANE		KAUKAUNA	WI	54130	EMERY		X
X		OCCUPANT	N2398 BODDE ROAD		KAUKAUNA	WI	54130	EVERS		X
X		LELAND M & PAMELA J MARTIN	232 ALISON COURT		WRIGHTSTOWN	WI	54180	MARTIN		X
X		LEON M & SHARON J EBBEN	N2220 TOWN CLUB ROAD		KAUKAUNA	WI	54130	EBBEN		X
X		LILAS A ROEHRBORN	2401 COUNTY ROAD U		WRIGHTSTOWN	WI	54180	ROEHRBORN		X
X		LISA GRASSMAN	2718 DON GERARD WAY		GREEN BAY	WI	54311	GRASSMAN		X
X		LORETTA M GREEN IRREVOCABLE TRUST	N2702 MCCABE ROAD		KAUKAUNA	WI	54130	GREEN		X
X		LYNN MARIE LEASING LLC DENNIS & LINDA SCHMIDT LAND CONTRACT	N2223 W FRONTAGE ROAD		KAUKAUNA	WI	54130	LYNN MARIE LEASING		X
X		M&H REALTY LLP	N2570 MCCABE ROAD		KAUKAUNA	WI	54130	M&H REALTY		X
X		MARK J & ERIN M VANZEELAN	W765 RIVER BEND DRIVE		KAUKAUNA	WI	54130	VANZEELAN		X
X		MARK J & JEANNE KERRIGAN	N2605 COUNTY ROAD U		WRIGHTSTOWN	WI	54180	KERRIGAN		X
X		MARK J & TRISHA S TETZLAFF	W668 RIVERVIEW COURT		KAUKAUNA	WI	54130	TETZLAFF		X
X		MARK R & MARY K HEINDEL	N2213 LOCK ROAD		KAUKAUNA	WI	54130	HEINDEL		X
X		MARY J MEHLIN	152 GOLF COURSE DRIVE		WRIGHTSTOWN	WI	54180	MEHLIN		X
X		MARY JANE BOWERS IRREVOCABLE REAL ESTATE TRUST	960 BROADWAY		WRIGHTSTOWN	WI	54180	BOWERS		X
X		MARY S VANDERHEIDEN	N2685 MCCABE ROAD		KAUKAUNA	WI	54130	VANDERHEIDEN		X
X		MICHAEL & ANN FRANZ	W696 RIVER BEND DRIVE		KAUKAUNA	WI	54130	FRANZ		X
X		MICHAEL B & LAURIE M BOWERS	N2134 SHAWN COURT		KAUKAUNA	WI	54130	BOWERS		X
X		MICHAEL B & MARY K DIEDERICH	N2118 SHAWN COURT		KAUKAUNA	WI	54130	DIEDERICH		X
X		MICHAEL C & KIMBERLY DENKINS	384 LONGWOOD LANE		WRIGHTSTOWN	WI	54180	DENKINS		X
X		MICHAEL D & STEPHANIE VANZEELAND	284 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	VANZEELAND		X
X		MICHAEL D & TIFFANY VANVREEDE	N2677 DELLA MARCUS DRIVE		KAUKAUNA	WI	54130	VANVREEDE		X
X		MICHAEL E & JONI M NINEDORF	630 ALYSSA STREET		KAUKAUNA	WI	54130	NINEDORF		X
X		MICHAEL J & CONNIE CLANCY JR	N2102 SHAWN COURT		KAUKAUNA	WI	54130	CLANCY		X
X		MICHAEL J THEUNIS	265 PADDY COURT		WRIGHTSTOWN	WI	54180	THEUNIS		X
X		MICHAEL L & NANCY A FRANCIS	W447 STATE ROAD 96		KAUKAUNA	WI	54130	FRANCIS		X
X		MICHAEL L FISCHER	1704 YORKSHIRE AVE		KAUKAUNA	WI	54130	FISCHER		X
X		MICHAEL R STRAINIS	2870 CROSSHAVEN AVE		GREEN BAY	WI	54313	STRAINIS		X
X		MICHAEL S & MARGARET JELENIC	444 EDGEWOOD DRIVE		GREEN BAY	WI	54302	JELENIC		X
X		MILTON J & AUDREY DAANEN	540 TACOMA BEACH ROAD #25		STURGEON BAY	WI	54235	DAANEN		X
X		NORBERT A & MARCY C VERBOOMEN	N2247 BODDE ROAD		KAUKAUNA	WI	54130	VERBOOMEN		X
X		NORMAN R BENEDICT	W565 STATE ROAD 96		KAUKAUNA	WI	54130	BENEDICT		X
X		NORTH CENTRAL STATES REG CARPENTERS	N2216 BODDE ROAD		KAUKAUNA	WI	54130	NORTH CENTRAL STATES		X
X		OOTC PROPERTIES LLC	N2161 TOWN CLUB ROAD		KAUKAUNA	WI	54130	OOTC PROPERTIES		X
X		PATRICK F & GWYN M HERMSEN	575 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	HERMSEN		X
X		PAUL & DENISE VANLAANEN REVOCABLE TRUST	178 GOLF COURSE DRIVE		WRIGHTSTOWN	WI	54180	VANLAANEN		X
X		PAUL J & MARY KAY HINKSON	239 THEUNIS DRIVE		WRIGHTSTOWN	WI	54180	HINKSON		X
X		PENNY J PRICE	N2230 TOWN CLUB ROAD		KAUKAUNA	WI	54130	PRICE		X
X		PETER G & LYNN R LAMERS	W750 RIVER BEND DRIVE		KAUKAUNA	WI	54130	LAMERS		X
X		PETER L & BARBARA E BOWERS	W313 GOLDEN GLOW ROAD		KAUKAUNA	WI	54130	BOWERS	NONE	X
X		PETER T & KELLY LEITERMAN	154 GOLF COURSE DRIVE		WRIGHTSTOWN	WI	54180	LEITERMAN		X
X		RAY E & KAREN A CURRY	296 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54130	CURRY		X
X		RICHARD & PATTI SECOOLISH	1505 HEATHER GLEN ROAD		KANNAPOLIS	NC	28018	SECOOLISH		X
X		RICHARD & SALLY HOPFENSBERGER	194 GOLF COURSE DRIVE		WRIGHTSTOWN	WI	54180	HOPFENSBERGER		X
X		RICHARD C & KAY D SAVELA	239 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	SAVELA		X
X		RICHARD G & DEBRA L MEULEMANS	W470 GOLDEN GLOW ROAD		KAUKAUNA	WI	54130	MEULEMANS		X
X		RICHARD J & BARBARA A FISCHER	215 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	FISCHER		X

PSC Code	Business Contact (Name)	Name of Business or Private Citizen	Primary Mailing Address or PO Box	Secondary Address (Street Address)	City	State	Zip	Sort (Last Name or Business Name - see Column C)	Email	PSC Code
X		RICHARD J & NANETTE VANDERLOOP	W597 STATE ROAD 96		KAUKAUNA	WI	54130	VANDERLOOP		X
X		RICHARD J BASTIAN	1435 MAIN STREET		WRIGHTSTOWN	WI	54180	BASTIAN		X
X		OCCUPANT	W233 DEERING LANE		KAUKAUNA	WI	54130	OVANS		X
X		RILEY L & JODY ASHER	2503 N SKYVIEW LANE		OZARK	MO	65721	ASHER		X
X		ROBERT & JAIME L FILTZKOWSKI	245 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	FILTZKOWSKI		X
X		ROBERT D & CAROLINE MIHALSKI	W612 DELLA MARCUS DRIVE		KAUKAUNA	WI	54130	MIHALSKI		X
X		ROBERT F SWENSON	844 RENEE COURT		KAUKAUNA	WI	54130	SWENSON		X
X		ROBERT J & CAROL M WALL	N1305 OUTAGAMIE ROAD		KAUKAUNA	WI	54130	WALL		X
X		ROBERT J & JENNIFER E BEASTER	PO BOX 169		KAUKAUNA	WI	54130	BEASTER		X
X		ROBERT J & LISA M VANDERLOO	N2437 BODDE ROAD		KAUKAUNA	WI	54130	VANDERLOO		X
X		ROBERT P & MELINDA A LAMERS	278 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	LAMERS		X
X		ROCK WERY	630 LINKDSVIEW COURT		WRIGHTSTOWN	WI	54180	WERY		X
X		RODNEY J & ANN M VANDYK	281 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	VANDYK		X
X		RONALD E & ELIZABETH VANASTEN	W457 CINDY ANN LANE		KAUKAUNA	WI	54130	VANASTEN		X
X		RONALD L & LINDA J WRUCK	W716 RIVER BEND DRIVE		KAUKAUNA	WI	54130	WRUCK		X
X		ROY & SANDRA BROWN	W483 STATE ROAD 96		KAUKAUNA	WI	54130	BROWN		X
X		ROYAL ST PATRICK DEVELOPMENT	201 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	ROYAL ST PATRICK DEVELOPMENT		X
X		RUS & MARGARET ROBLEY REVOCABLE LIVING TRUST	N2595 MCCABE ROAD		KAUKAUNA	WI	54130	ROBLEY		X
X		RYAN R QUELLA	N9665 STATE PARK ROAD #102		APPLETON	WI	54915	QUELLA		X
X		SCOTT A & SANDY J FRAGALE	260 THEUNIS DRIVE		WRIGHTSTOWN	WI	54180	FRAGALE		X
X		SCOTT A RIPP	5081 COUNTY ROAD P		STURGEON BAY	WI	54235	RIPP		X
X		SCOTT T & JULIE A MITCHLER	W486 CINDY ANN LANE		KAUKAUNA	WI	54130	MITCHLER		X
X		SEVEN OAKS DAIRY LLC (JON LAMERS)	W229 COUNTY ROAD ZZ		KAUKAUNA	WI	54130	SEVEN OAKS DAIRY		X
X		STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	944 VANDERPERREN WAY		GREEN BAY	WI	54304	STATE OF WISCONSIN		X
X		STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES	2984 SHAWANO AVE		GREEN BAY	WI	54313	STATE OF WISCONSIN		X
X		STEVE CHANEY	1710 PATRIOT DRIVE		WAUSAU	WI	54403	CHANEY		X
X		STEVEN J & JULIE A HOUDEK	W494 CINDY ANN LANE		KAUKAUNA	WI	54130	HOUDEK		X
X		TERRANCE & KRISTINE VANEPERN	W489 CINDY ANN LANE		KAUKAUNA	WI	54130	VANEPERN		X
X		TERRY L VANZEELAND	3516 N JUANITA LANE		APPLETON	WI	54911	VANZEELAND		X
X		THE COCA COLA COMPANY	1495 BROADWAY ST		WRIGHTSTOWN	WI	54180	THE COCA COLA COMPANY		X
X		THOMAS A & CATHY M GLASER	293 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	GLASER		X
X		THOMAS A & SHERRY L CRAIG	W780 RIVER BEND DRIVE		KAUKAUNA	WI	54130	CRAIG		X
X		THOMAS H & JEANNE EMMER	W104 STATE ROAD 96		KAUKAUNA	WI	54130	EMMER		X
X		THOMAS J & DONNA BARTELT	150 LOCK ROAD		KAUKAUNA	WI	54130	BARTELT		X
X		THOMAS R & SUSAN J SCHREURS	N2335 COUNTY ROAD U		WRIGHTSTOWN	WI	54180	SCHREURS		X
X		TIMOTHY B & MELISSA A MATTSON	436 GORDON WAY		WRIGHTSTOWN	WI	54180	MATTSON		X
X		TIMOTHY M RAUPP	172 GOLF COURSE DRIVE		WRIGHTSTOWN	WI	54180	RAUPP		X
X		TIMOTHY T VILS SURVIVORS TRUST	W370 COUNTY ROAD ZZ		KAUKAUNA	WI	54130	VILS	tvils@earthlink.net	X
X		TODD G & SUSAN L VANZEELAND MARITAL TRUST	W727 RIVER BEND DRIVE		KAUKAUNA	WI	54130	VANZEELAND		X
X		TODD L & STEPHANIE L THOMAS	W685 RIVERVIEW COURT		KAUKAUNA	WI	54130	THOMAS		X
X		TODD M CALMES	N2233 BODDE ROAD		KAUKAUNA	WI	54130	CALMES		X
X		TOM & MAUREEN VANZEELAND JOINT REVOCABLE TRUST	257 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	VANZEELAND	tmvz@earthlink.net	X
X		TOM G & MICHELLE M EITING	W672 RIVERVIEW COURT		KAUKAUNA	WI	54130	EITING		X
X		TRENT C NELSON	215 THEUNIS DRIVE		WRIGHTSTOWN	WI	54180	NELSON		X
X		TROY R & CAROLEE M LASECKI	233 PETERLYNN DRIVE		WRIGHTSTOWN	WI	54180	LASECKI		X
X		TYLER L & BEVERLY A JAHN	280 PADDY COURT		WRIGHTSTOWN	WI	54180	JAHN		X
X		US GOVERNMENT	N2205 LOCK ROAD		KAUKAUNA	WI	54130	US GOVERNMENT		X
X		VERKUILEN BUILDERS LLP	N2844 SLEEPY CREEK DRIVE		KAUKAUNA	WI	54130	VERKUILEN BUILDERS		X
X		VILLAGE OF WRIGHTSTOWN	352 HIGH STREET		WRIGHTSTOWN	WI	54180	VILLAGE OF WRIGHTSTOWN		X
X		VINCE R & LINDA BELLANTONIA	293 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	BELLANTONIA		X
X		VINCENT & CHRIS BELLANTONIA	257 THEUNIS DRIVE		WRIGHTSTOWN	WI	54180	BELLANTONIA		X
X		WALTER & KAREN BENTLEY REVOCABLE LIVING TRUST	3296 SQUAW ISLAND ROAD		STURGEON BAY	WI	54235	BENTLEY		X

PSC Code	Business Contact (Name)	Name of Business or Private Citizen	Primary Mailing Address or PO Box	Secondary Address (Street Address)	City	State	Zip	Sort (Last Name or Business Name - see Column C)	Email	PSC Code
X		WAYNE G & JUDY A BODDE	N2398 BODDE ROAD		KAUKAUNA	WI	54130	BODDE		X
X		WAYNE R VANDEVOORT	544 SONGBIRD AVE		WRIGHTSTOWN	WI	54180	VANDEVOORT		X
X		WESLEY K & LINDSAY WENDLANDT	469 ROYAL ST PATS DRIVE		WRIGHTSTOWN	WI	54180	WENDLANDT		X
X		WILLIAM G & PATRICE FELDKAMP	W404 COUNTY ROAD ZZ		KAUKAUNA	WI	54130	FELDKAMP		X
X		OCCUPANT	N2263 TOWN CLUB ROAD		KAUKAUNA	WI	54130	MARKOWSKI		X
X		WILLIAM M & PAULA E MORRIS	W444 CINDY ANN LANE		KAUKAUNA	WI	54130	MORRIS		X
X		WILLIAM W & MELODY BODDE	N2380 BODDE ROAD		KAUKAUNA	WI	54130	BODDE		X
X		WISCONSIN CENTRAL LTD	17641 ASHLAND AVE		HOMEWOOD	IL	60430	WISCONSIN CENTRAL		X
X		WISCONSIN BELL INC	722 N BROADWAY		MILWAUKEE	WI	53202	WISCONSIN BELL		X
X		WISCONSIN DEPARTMENT OF AGRICULTURE	POBOX 7866		MADISON	WI	53707	WISCONSIN DEPARTMENT OF AGRICULTURE		X
X		WJR LLC	N2398 BODDE ROAD		KAUKAUNA	WI	54130	WJR		X
X		ZIMZ PROPERTIES LLC	N286 HILLSIDE DRIVE		APPLETON	WI	54915	ZIMZ PROPERTIES		X
X		BRITTANY VILS	W370 COUNTY ROAD ZZ		KAUKAUNA	WI	54130	VILS	turtlenest@earthlink.net	X
X		HELEN JOYCE	447 N MICHIGAN ST		DE PERE	WI	54115	JOYCE	helenjoyce1995@hotmail.com	X

PSC Code	Business Contact (Name)	Name of Business or Private Citizen	Primary Mailing Address or PO Box	Secondary Address (Street Address)	City	State	Zip	Sort (Last Name or Business Name - see Column C)	Email	PSC Code
X		BUDS FARM LLC	336 MAIN STREET		WRIGHTSTOWN	WI	54180	BUDS FARM LLC		X
X		CITY OF KAUKAUNA	201 W SECOND STREET		KAUKAUNA	WI	54130	CITY OF KAUKAUNA		X
X		DALE & NANCY SCHMIDT	941 DAY STREET		GREENLEAF	WI	54126	SCHMIDT		X
X		ROBERT SCHMIDT	881 DAY STREET		GREENLEAF	WI	54126	SCHMIDT		X
X		DARREL & JANE PAHL	990 DAY STREET		GREENLEAF	WI	54126	PAHL		X
X		GERALD GERRITS JR	6788 CTG D		GREENLEAF	WI	54126	GERRITS		X
X		IONE GERRITS SURVIVORS TRUST	7610 ST PATS CHURCH ROAD		GREENLEAF	WI	54126	GERRITS		X
X		MARVIN & PATRICIA BIESE REVOCABLE LIVING TRUST	6838 CTH D		GREENLEAF	WI	54126	BIESE		X
X		PAUL & MARIAN VANDEHEY REVOCABLE TRUST	7040 SHANTY ROAD		GREENLEAF	WI	54126	VANDEHEY		X
X		SCOTT & KRISTIN PETERSON AND PATRICK & BERNARD GEIGER	124 BENGAL LANE		WRIGHTSTOWN	WI	54180	PETERSON		X
X		PLUM PRIDE HOLSTEINS LLC	7016 CTH D		GREENLEAF	WI	54126	PLUM PRIDE HOLSTEINS LLC	mpbiese415@att.net	X
X		STEPHEN & JANET WIERSCHKE	938 DAY STREET		GREENLEAF	WI	54126	WIERSCHKE		X
X		THOMAS & GAELE JACKSON LIVING TRUST OF 2005	6905 SHANTY ROAD		GREENLEAF	WI	54126	JACKSON		X
X		WIERSCHKE FAMILY LP (KEN WIERSCHKE)	932 DAY STREET		GREENLEAF	WI	54126	WIERSCHKE FAMILY LP		X
X		SCOTT & PATTY VANDENHEUVEL	W290 COUNTY ROAD ZZ		KAUKAUNA	WI	54130	VANDENHEUVEL		X

Name	Address	Municipality	Location/Interest	Phone or email	Session	RSVP'd	Attended
Mark Surwillo	801 Thilmany Rd.	Kaukauna	Heart of the Valley Metropolitan Sewerage District	mark.surwillo@humsd.org	Afternoon	yes	yes
Patty and Scott Van Den Heuvel	W290 Cty Rd ZZ	Kaukauna	Home on Fox River directly across from plant	920-655-4707	Evening	yes	yes
Scott Peterson	124 Bengal Lane	Wrightstown	Neighborhood East of Cty Hwy D North of gas line route	920-475-2750	Evening	yes	yes
Steve Wierschke	938 Day St.	Greenleaf	North of gas line		Evening	yes	yes
Mike and Laurie Bowers	N2134 Shawn Ct.	Kaukauna	North west home owner in subdivision south of plant	920-766-2171	Evening	yes	yes
John Wollner	569 Royal St. Patricks Dr.	Wrightstown	Royal St. Patrick's Subdivision		Afternoon	yes	yes
Keith Wendlandt	562 Royal St. Patricks Dr.	Wrightstown	Royal St. Patrick's Subdivision		Afternoon	yes	yes
Thomas Van Zeeland	257 Peterlynn Dr.	Wrightstown	Royal St. Patrick's Subdivision		Afternoon	yes	yes
John and Mary Baranowski	445 Gordon Way	Wrightstown	Royal St. Patrick's Subdivision	920-462-4650	Evening	yes	yes
Nancy & Dale Schmidt	941 Day St	Greenleaf		920-532-4805	Afternoon	no	yes
Robert Schmidt	881 Day St	Greenleaf			Afternoon	no	yes
George Fickau	W239 Deering			Gfickau@gmail.com	Afternoon	no	yes
Damien Sommer			ATC	dsommer@atcllc.com	Afternoon	no	yes
Shane Ehster	W234W2000 Ridgview Parkway Ct		ATC	sehster@atcllc.com	Afternoon	no	yes
Rick Czajka	2185 Trailside Lane	DePere	ATC	rczaike@atcllc.com	Afternoon	no	yes
Jerry & Wendy Van Camp	W2117 Shawn Ct	Kaukauna			Afternoon	no	yes
Darrell & Jane Pahl	990 Day St	Greenleaf			Afternoon	no	yes
Ann Bowers	Deering Ln				Afternoon	no	yes
Representative Al Ott					Afternoon	no	yes
Jeff Feldt	PO Box 1777	Kaukauna	Kaukauna Utilities	jfeldt@ku-wi.org	Afternoon	no	yes
Marvin & Pat Biese	6838 County Rd	Greenleaf			Afternoon	no	yes
Jane Petrai			ATC		Afternoon	no	yes
David Smith			ATC		Afternoon	no	yes
John Powers	514 Royal St Pats	Wrightstown			Afternoon	no	yes
Paul Vandehey	7040 Shanty Rd Greenleaf	Greenleaf			Afternoon	no	yes
Jon Lamers	W229 County Rd ZZ	Kaukauna			Afternoon	no	yes
Marv Biese Jr	7016 Greenleaf	Greenleaf		mpbiese415@att.net	Afternoon	no	yes
Dennis Gloudeman	W621 Della Marcen			920-213-0490	Evening	no	yes
Ed Byrnn			Newspaper Reporter		Evening	no	yes
Rick Savela	239 Peterlynn Dr	Wrightstown			Evening	no	yes
Ken Wierschke	932 Day St	Greenleaf		920-532-6638	Evening	no	yes
Dan & Denise Zwick	W303 Golf Course Dr	Wrightstown		920-532-4542	Evening	no	yes



Fox 3 Comments, Concerns, Suggestions

Name: _____

Address: _____

Your comment or suggestion:

FOGGING
on 96 want
may signage

Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: KICK SAVELLA

Address: 239 PETERCANY
WRIGHTSTOWN

Your comment or suggestion:

IF BUILT - I PREFER
LAYOUT 2

Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: JOHN BARANOWSKI

Address: 445 GORDON WAY
WRIGHTSTOWN

Your comment or suggestion:

ONLY CONCERN IS THE STEAM FROM THE
COOLING TOWERS FROSTING OVER GOLF COURSE
DRIVE ON THE NORTHERN MOST PROPOSAL (WINTER ONLY)

Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: Darrell & Jane Pahl

Address: 990 Day Str
Greenleaf, WI 54126

Your comment or suggestion:

Please correct map to show accurate
location of current pipeline and
future connections.

Thank you!

lites shine



like SE
option #2

Fox 3 Comments, Concerns, Suggestions

Name: Zwick Dan + Denise Zwick

Address: W303 Golf Course Dr
Wrightstown WI 54180

Your comment or suggestion:
Noise w/ steam vent
& alarms w/ that

Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: Tom Van Zealand

Address: 257 Peterlynn Dr.
Wrightstown

Your comment or suggestion:
Wondering how close to Wrightstown Rd.
should be a bus + tree or some
for buffer

Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: Lamers Dany

Address: Kankana Utilities, SW corner of pipeline
Milk 800 rows route

Your comment or suggestion:
Concerned about S.U. with pipeline. Does not
want current to be carried into his farm
from the pipeline. Along with Al Ott.

Thank you! (Corey Kuchta talked with)



Fox 3 Comments, Concerns, Suggestions

Name: John Wollner

Address: 569 Royal St. Patrick's Dr.
Wrightstown

Your comment or suggestion:
Prefer Option 2 (Southeast Option)
No access for construction vehicles from Golf Course
Natural buffer (trees, hedges, etc) on north Pr.

Thank you! side of property to block view of
plants from Royal St. Pat's neighborhood.



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: FRED

Address: _____

Your comment or suggestion:
Can we look @ using sludge
for long spreading?
fertilizer?
for phosphorus.

Thank you!



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: Ann Bowers

Address: W 215 Deering Ln.
Kaukauna, WI 54130

Your comment or suggestion:
Lights not polluting sky - force of light aimed
Protecting local shells of = at ground

Thank you!



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: Mark Surwillo Heart of Valley MSU

Address: 801 Thilmann Rd, KK

Your comment or suggestion:
opposed to the diagonal route
across the SW section of
our parcel

Thank you!



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: Nancy Schmidt (For: Dale)

Address: 941 Day St
Greenleaf, WI 54126

Your comment or suggestion:
Our parcel is in the USDA CRP program.
If you get approvals from them to go ahead
with the pipe, we would like a copy of that
approval for our records.

Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: Scott Petersen

Address: 124 Beagel Ln
Weyauwega, WI

Your comment or suggestion:
Gas Pipeline Petersen property would like to if the
pipeline could be moved to the south side of the transmission
lines.

Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: Mike Bowers

Address: 22134 Shawn Ct

Your comment or suggestion:
Keep the lighting down. We like the
North option.

Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: KAREN CURRY

Address: 296 PETERLYNN DR
WRIGHTS POINT WI

Your comment or suggestion:
SEE REVERSE

Thank you!

As a Village RSP Resident I suggest
WPS purchase the 20+ acres at corner
of Frontage Rd & Golf Course Dr. The
Village would accept this property
as a donation to the Village Park
System. Improvements to property
could include tennis courts, basketball
courts, water park, etc.



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: KEITH WENPLANDT

Address: 502 ROYAL SAINT PATS DRIVE, WRIGHTSTOWN

Your comment or suggestion:

1) CONSOLIDATE/CONDENSE PROJECT FOOTPRINT & EXISTING FACILITY AS OPPOSED TO SPREADING IT OUT OVER LARGE TRACT OF LAND. 2) INCLUDE BUFFER/GREEN ZONE TO THE NORTH OF THE FACILITIES TO SHIELD/HIDE VIEW FROM GOLF COURSE ROAD. Thank you! TREES TO BREAK UP LIGHTS SHINING FROM FACILITIES

- 3) CONCERN & DUST (PREVAILING WINDS FROM SOUTHWEST) & NOISE DURING CONSTRUCTION PHASE(S). CURRENT PLANT IS QUIET & VERY CLEAN & WE'D EXPECT THE SAME & THE EXPANDED OPERATION/EQUIPMENT - BUT DURING CONSTRUCTION THERE COULD BE ISSUES.
- 4) ACCESS ROUTE(S) TO SITE FOR CONSTRUCTION EQUIPMENT, DELIVERY OF PARTS & MATERIALS. GOLF COURSE ROAD/WRIGHTSTOWN ROAD IS ALREADY IN ILL REPAIR -
- 5) GET THE WEB SITE UP A.S.A.P. TO ALLOW FOR ACCESS TO INFORMATION/F.A.Q. & DISCOURT MISINFORMATION/RUMORS.



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: GEORGE FICKAU

Address: _____

Your comment or suggestion:

for
Concerned with Fog From Condensation Towers across Hwy 96 and towards his property; he would like to see the plan going further north, than the plan goes East.
Thank you! He does want the Plant Builder! CK.



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: George Fickau

Address: _____

Your comment or suggestion:

- Would like lighting to stay on property
- Use Kohler as an example, they have excellent parking lot lighting
- Too much lighting with old property
Thank you!



Fox 3 Comments, Concerns, Suggestions

Name: George Fickau

Address: _____

Your comment or suggestion:
in George's opinion we are not in compliance with the the
discharge into the Fox River, in George's opinion
we need an air vent in the pipe before the discharge
of water into the river.
Thank you!

Test of email received 5/22 from George Fickau

Hi Team,
FYI

- I was invited to attend the open house for the proposed plant expansion (attached)
- I am in favor of the expansion. (just so you which camp I'm in)
- I did talk to each "Subject Matter Expert" on the topics of:
 - Noise
 - Baseline levels prior to start of work
 - How to find the original permit levels and post construction validation
 - How data was collected and shared with the public and identification of sample points outside WPS property lines
 - Completed unit level validation process
 - Correction to meet permit/plan if finished project does not meet the permitted values
 - Ground water tables
 - Water source and need for a well
 - Supply/Cooling tower makeup water source
 - Light pollution
 - Using Kohler, WI as a great example of light control with definite lighting cutoff
 - The original plant lights the night sky and looks like an old oil refinery
 - Cooling tower placement
 - There are times when the condensate from stacks and cooling tower totally cover the field to the South and create a 100% drop in visibility on HWY 96
 - In the one plan with the cooling tower placement there may be times when condensate clouds may cross/ cover my property
 - Water discharge
 - Where we started and where we are now. **I shared what a great job the plant and WPS has done** ... (sorry I didn't want to be a name dropper so you may not get direct feedback). I do have concerns about ongoing and increased flow bringing the problem back. We really don't have closure on this topic, e.g. where did the foaming go? what was the cause, what was/is the cure, what will be the future. I fully agree the plant is now compliant with the WPDES permit section 5.3.3 for visual foam and floating solids
 - I did bring up the "boiling" / "air entrained" water. My next step is to eliminate this, just as we have done with the foam.
 - How can we de-aerate the water from the existing plant and will the addition of the second plant make this problem worse
 - I would bet if water samples are taken from the boiling water the chemical/ bod (or whatever) concentration is higher than plan, as the duck bill is not dispersing the water as per design. The rising water and air should pull the surrounding water towards the

column, similar to the way an air pump keeps the ice open on a pond./

- I again offer my help to remedy this

Not sure why they needed so many WPS people there and was hoping to see Randy and Mark just to say "Hi". Scott was there. There wasn't any real meeting or a person taking minutes but they did have cards of concern you could fill out.... (kind of a weak attempt to win support, if you ask me)

Randy and Scott, Thanks for the great work keeping the foam away.... It has been a much nicer view

George Fickau





Name	Address	Secondary Address (Street Address)	Municipality	State	Zip	Email	Session
City of Kaukauna (Jeff Feldt)	PO Box 1777	777 Island St.	Kaukauna	WI	54130	jfeldt@ku-wi.org	Afternoon
John Wollner	569 Royal St. Pats Dr.		Wrightstown	WI	54180	jwollner@new.rr.com	Afternoon
Keith Wendlandt	562 Royal St. Pats Dr.		Wrightstown	WI	54180	keithandsandra@new.rr.com	Afternoon
Pete Bowers	496 East Frontage Road		Kaukauna	WI	54130	none	Afternoon
Gerald Van Camp	N2117 Shawn Ct.		Kaukauna	WI	54130	givcent@hotmail.com	Afternoon
Brittany Vils	W370 County Road ZZ		Kaukauna	WI	54130	turtlenest@earthlink.net	Afternoon
Tom Van Zeeland	257 Peterlynn Dr.		Wrightstown	WI	54180	tmvz@earthlink.net	Afternoon
Helen Joyce	447 N. Michigan St.		DePere	WI	54115	helenjoyce1995@hotmail.com	Afternoon
Jason Gerend	W376 COUNTY ROAD ZZ		KAUKAUNA	WI	54130	jwgerend@gmail.com	Evening
Tim Vils	W370 COUNTY ROAD ZZ		KAUKAUNA	WI	54130	tvils@earthlink.net	Evening



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: Tim Vils
Address: W370 County Road ZZ
Email address: tvils@earthlink.net

Your comment or suggestion:
As a resident with direct impact from this proposed expansion, living immediately across the street, our property values have been decreased and quality of living diminished due to noise, light and aesthetic view. All without receiving any benefit. Expanding an already negative environment

only compounds the situation. This was a beautiful, rural, agricultural setting which is being transformed into a colossal industrial compound. All at the expense of the local citizens and the natural environment. The initial site was approved for a single generator, where does this end?



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: Jason Gerend
Address: W376 Cty Rd ZZ
Email address: jwgerend@gmail.com

Your comment or suggestion:
lower lighting, like ~~plan 1~~ more, tax credits for equal distance away from plant, not just town of Kaukauna, its an eye sore to me, why only turn to north, why not south?

Thank you! install downward lighting on existing plant!



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: KEITH WENDLANDT
Address: 562 ROYAL SAINT PATS DRIVE
WRIGHTSTOWN, WI 54180

Your comment or suggestion:
DEFINITELY SUPPORT PREFERRED (OPTION #2) SITE PLAN FOR FOX3 POWER PLANT. EXCELLENT PLAN - MOST ACCOMODATING TO SURROUNDING NEIGHBORHOOD(S) AND COMMUNITY.

Thank you!



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: Brittany Oils
Address: W520 HWY 22 Kaukauna WI 54130
Email address: _____

Your comment or suggestion:
Is there anything that can be done to cover up
the site from those that live across the river from
the plant.

Thank you!



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: GERALD VAN CAMP
Address: N2117 SHAWNEE CT. KAUKAUNA WI 54130
Email address: GJVCENT@HOTMAIL.COM

Your comment or suggestion:
? RAIL TRAFFIC, WHAT IF CONDENSATION
* AND CONCERNS IF THERE IS AN ACCIDENT
WITH PETROCHEMICAL TRAFFIC.

Thank you!



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: John Wallner
Address: 569 Royal St. Patrick's Pk, Wrightstown
Email address: jwallner@new.m.com

Your comment or suggestion:
Strongly prefer the South Option
Berm on the north side of the property is important
for aesthetics and noise control

Thank you!



Wisconsin Public Service
An Integrys Energy Group Company

Fox 3 Comments, Concerns, Suggestions

Name: GERALD VAN CAMP
Address: N2117 SHAWNEE CT.
Email address: GJVCENT@HOTMAIL.COM

Your comment or suggestion:
CONDENSATION FROM COOLING TOWERS
HOW MUCH IN DIRECTION FROM TOWNS

Thank you!

APPENDIX O SOUND ASSESSMENT STUDY



Sound Assessment Study



Wisconsin Public Service

Fox Energy Center 3

Docket No. 6690-CE-202

November 2014

Sound Assessment Study

prepared for

**Wisconsin Public Service
Fox Energy Center 3
Wrightstown, WI**

November 2014

Docket No. 6690-CE-202

prepared by

**Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri**

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
Act	Noise Control Act of 1972
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CadnaA	Computer Aided Design for Noise Abatement
dB	Decibels
dba	A-weighted decibels
dbc	C-weighted decibels
EPA	U.S. Environmental Protection Agency
HRSG	Heat Recovery Steam Generator
Hz	Hertz
L_{ave}	average sound level
L_{dn}	24-hour day-night weighted average sound level
L_p	sound pressure level
L_w	sound power level
L_x	sound level exceeded “x” percent of the sampling period
Fox 3	Fox Energy Center 3
Protocol	Public Service Commission of Wisconsin “Measurement Protocol for Sound and Vibration Assessment of Proposed and Existing Electric Power Plants”
PSCW	Public Service Commission of Wisconsin
WPS	Wisconsin Public Service

1.0 INTRODUCTION

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) has been contracted by Wisconsin Public Service (WPS) to conduct a facility noise assessment study for the proposed construction of Fox Energy Center 3 (Fox 3). The proposed Fox 3 would be a combined-cycle power plant addition at the existing Fox Energy Center located in the Village of Wrightstown, WI. Adjacent properties are located in the Village of Wrightstown and the Town of Kaukauna, WI. The existing facility consists of two natural gas fired, combined-cycle units (Fox 1 and 2). The proposed Fox 3 will be permitted to operate 24 hours per day, 365 days per year, but would operate in accordance with market dispatch signals.

There were several objectives in this study, which included:

- Identification of any applicable municipal, county, state, or federal noise ordinances and other applicable noise guidelines;
- Measurements of ambient sound levels near sensitive receivers surrounding the proposed site;
- Estimation of the operational noise levels from the proposed Fox 3 using the industry-accepted three-dimensional noise modeling program;
- Estimation of the impacts from project-related construction noise;
- Identification of any required noise mitigation equipment and procedures; and
- Determination if operation of the Fox 3 would be in compliance with the applicable noise regulatory standards.

The following sections describe the project approach, ambient measurements, methodology for modeling noise, and results.

2.0 ACOUSTICAL TERMINOLOGY

The term “sound level” is often used to describe two different sound characteristics called sound power and sound pressure. Every source that produces sound has a sound power level (L_w). The sound power level is the acoustical energy emitted by a sound source and is an absolute number that is not affected by the environment. The acoustical energy produced by a source propagates through the air as air pressure fluctuations. These pressure fluctuations, also called sound pressure (L_p), are what human ears hear and microphones measure.

Sound energy is physically characterized by amplitude and frequency. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals). The reference sound pressure corresponds to the typical threshold of human hearing. A 3-dB change in a continuous broadband noise is generally considered “just barely perceptible” to the average listener. A 6-dB change is generally considered “clearly noticeable” and a 10-dB change is generally considered a doubling (or halving, if sound is decreasing) of the apparent loudness.

Frequency is measured in hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels or dBA. For reference, the A-weighted sound pressure level and subjective loudness associated with some common noise sources are listed in Table 2-1.

Table 2-1: Typical Sound Pressure Levels Associated with Common Noise Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 feet	--
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 feet	--
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1,000 feet	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 feet, auto horn at 10 feet, crowd noise at football game	--
90	--	Propeller plane flyover at 1,000 feet, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 feet	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner, electric typewriter
60	Moderate	Air-conditioner condenser at 15 feet, near highway traffic	General office
50	Quiet	--	Private office
40	--	Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without TV and stereo)
20	--	Rustling leaves	Quiet theater, whisper
10	Just audible	--	Human breathing
0	Threshold of hearing	--	--

Source: Adapted from *Architectural Acoustics*, M. David Egan, 1988 and *Architectural Graphic Standards*, Ramsey and Sleeper, 1994.

Another weighting scale is the C-weighting scale. The C-weighting scale can be useful in evaluating low-frequency sound levels. Excessive levels of low frequency noise, while not being readily perceptible to the human ear, can be sensed as airborne vibrations. These vibrations can be felt as much as they can be heard. In extreme cases, these vibrations may cause light frame structures to vibrate, causing a noticeable vibration within residences. Any sound level to which the C-weighting scale has been applied is expressed in C-weighted decibels or dBC. In general, low-frequency impacts to residences in the form of

perceptible vibrations are minimized when the C-weighted sound pressure levels are at or below 75 to 80 dBC.

Noise in the environment is constantly fluctuating; examples could be when a car drives by, a dog barks, or a plane passes overhead. Therefore, sound metrics have been developed to quantify fluctuating environmental sound levels. These metrics include the exceedance sound levels. The exceedance sound level, L_x , is the sound level exceeded “x” percent of the sampling period and is referred to as a statistical sound level. The most common L_x values are L_{ave} , L_{90} , L_{50} , and L_{10} . L_{ave} is the average sound level for a specific time period. The L_{90} is the sound level exceeded 90 percent of the sampling period and represents the sound level without the influence of loud, transient noise sources. The L_{90} is often used to represent the ambient sound level in an area. The L_{50} is the sound level exceeded 50 percent of the sampling period. The L_{10} represents the occasional louder sounds and is often referred to as the intrusive sound level. An additional sound metric is the L_{dn} . L_{dn} is a 24-hour, time-weighted average sound level that is often used to represent community sound levels. A 10-dB nighttime penalty is added to the nighttime hours, 10 P.M. to 7 A.M., to account for added sensitivity to noise during the night. L_{ave} , L_{10} , L_{50} , L_{90} , and L_{dn} are the metrics that are presented in this report.

3.0 APPLICABLE REGULATIONS

Burns & McDonnell reviewed applicable federal, state, county, and municipal sound regulations for the Fox 3 site. Fox 3 would be located in the Village of Wrightstown, WI, and the existing site is zoned for Industrial use. Adjacent properties to the north and northwest are located in the Village of Wrightstown, WI, and are zoned for Residential and Business uses. Adjacent properties to the east and south are located in the Town of Kaukauna and are zoned for Exclusive Agricultural use. Adjacent properties to the west are located in the Town of Kaukauna are zoned for Light Industrial use. Figure 3-1 shows the project location, zoning, and noise limits of the surrounding area.

3.1 Federal, State, and County Noise Regulations

The Noise Control Act of 1972 (the Act)¹ mandated a national policy “to promote an environment for all Americans free from noise that jeopardizes their health or welfare, to establish a means for effective coordination of federal research activities in noise control, to authorize the establishment of federal noise emission standards for products distributed in commerce, and to provide information to the public respecting the noise emission and noise reduction characteristics of such products.” As required by the Act, the U.S. Environmental Protection Agency (EPA) published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*² in 1974. The State of Wisconsin and the County of Outagamie do not have any specific noise regulations applicable to Fox 3. The Public Service Commission of Wisconsin (PSCW) “Measurement Protocol for Sound and Vibration Assessment of Proposed and Existing Electric Power Plants” (Protocol) defines the process for measurement of ambient sound levels. However, the Protocol does not contain specific noise limits or criteria for the evaluation of project-related noise impacts.

Therefore, there are no enforceable federal, state, or county noise regulations which would be applicable to Fox 3. However, there are enforceable local noise regulations, as discussed in the following sections.

3.2 Village of Wrightstown Noise Ordinance

The Village of Wrightstown Noise Ordinance lists the following noise requirements which are applicable to properties located north and northwest of the project³:

¹ United States Code (U.S.C.): 42 U.S.C. 4901 to 4918

² The U.S. Environmental Protection Agency, Office of Noise Abatement and Control

³ Village of Wrightstown Administrative Code, Chapter 139: Peace and Good Order. <<http://www.ecode360.com/9845804>>. Accessed July 30, 2014.

§139-6 Loud and Unnecessary Noise Prohibited

(2) Stationary noise limits.

(a) Maximum permissible sound levels.

(1) Noise from a stationary source shall not exceed the following standards for maximum sound pressure levels measured at the property line:

Zone	Noise Rating - Daytime	Noise Rating - Nighttime
Residential	75 dB	65 dB
Commercial	85 dB	75 dB
All other zones	75 dB	75 dB

(2) Ambient noise is the all-encompassing noise associated with a given source, usually being a composite of sounds with many sources near and far, but excluding the noise source being measured. Ambient noise is a factor and the subject noise shall not exceed the ambient noise by 5 dB in any octave band to be designated excessive.

(3) Pure tones and impulsive noises are factors. Five noise rating numbers shall be taken from the table as listed in Subsection A(2)(a)[1], if the subject noise consists primarily of a pure tone or if it is impulsive in character.

(b) Construction noise. Construction equipment in any zone may be operated between the hours of 7:00 a.m. and 9:00 p.m., provided that said equipment does not exceed a maximum sound level of 80 db(a) measured at the property line of the location at which said equipment is in use.

The Village of Wrightstown's Noise Ordinance, Section 139-6; Item 2.a.2, requires that impacts to property lines in the surrounding areas not increase the ambient noise levels by more than 5 dB in any octave band. It is understood that WPS is pursuing a variance from this criterion. Therefore, this study does not include analysis in relation to this particular criterion.

The full noise ordinance for the Village of Wrightstown is included in Appendix A of this report.

3.3 Town of Kaukauna Zoning Ordinance

The Town of Kaukauna Zoning Ordinance lists the following noise requirements for Light and Heavy Industrial Zones, which is applicable for properties south, east, and west of the project:

§3.9(D) Noise Ordinance

(2) Maximum Permissible Sound Levels. No person shall exceed the maximum permissible sound levels:

(a) Between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday, 85 decibels.

(b) All other times, 70 decibels.

(5) Exemption. This provision shall not be applicable to:

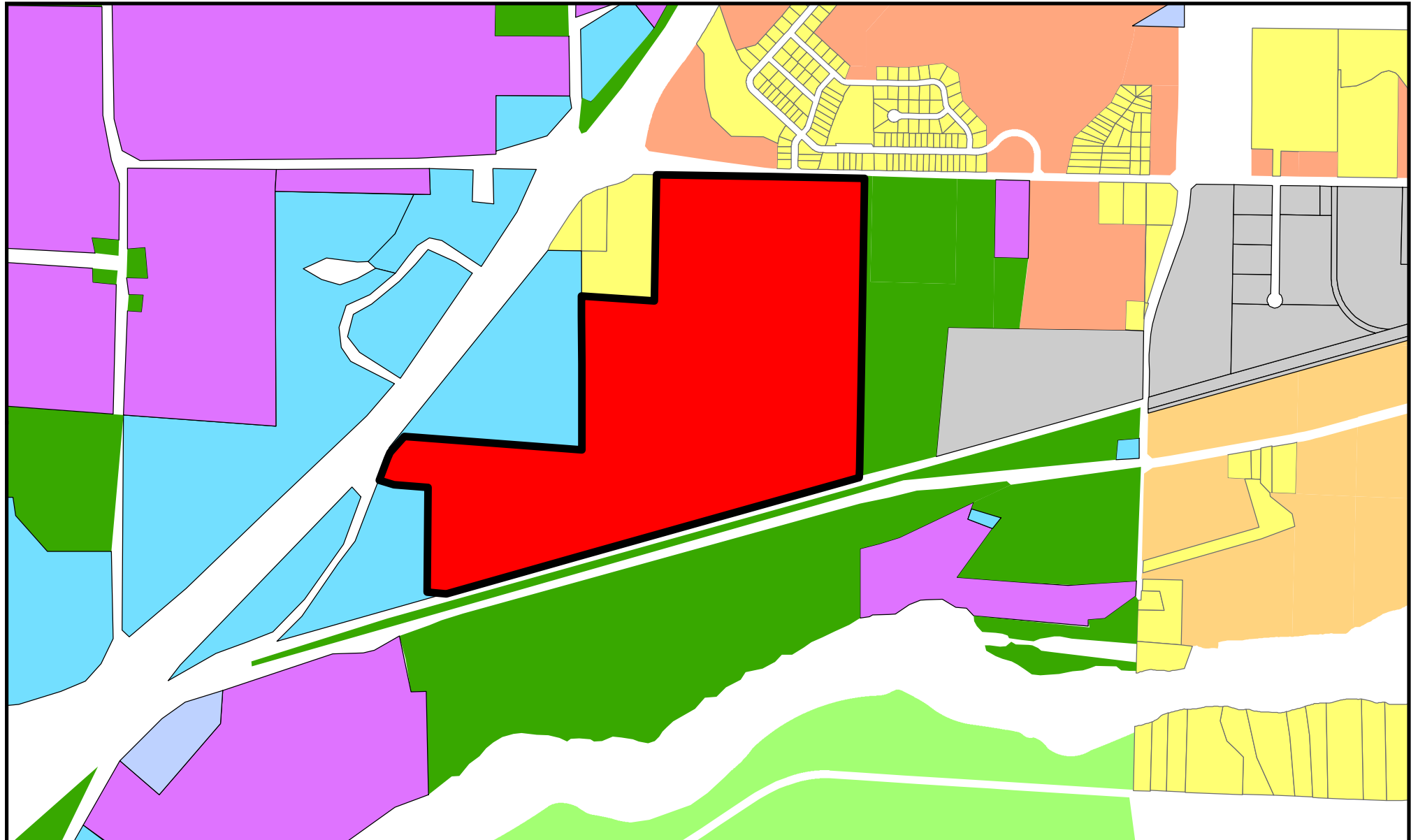
- (a) Any Town vehicle while engaging in necessary public business.
- (b) Excavations or repairs to streets or other public construction by or on behalf of the Town, County or State.










The full noise ordinance for the Town of Kaukauna is included in Appendix A of this report.

3.4 Project Design Criteria

Based on the available information, as shown above, the applicable criteria at each property line is as follows:

- Adjacent properties north and northwest of the proposed Fox 3 site are located within the Village of Wrightstown and are subject to the following requirements:
 - Future impact must be 65 dBA or less at adjacent property lines;
 - If primary noise sources are tonal in nature, the residential criteria is reduced by 5 dB; and
 - Construction noise shall not exceed 80 dBA at the property line, and must be limited to between the hours of 7 A.M. and 9 P.M.
- Adjacent properties south and east of the proposed Fox 3 site are located within the Town of Kaukauna, zoned for Exclusive Agricultural use, and subject to the following requirements:
 - Future impacts from the project must be 70 dBA or less at the property lines; and
 - Construction noise is exempt from the noise ordinance.
- Adjacent properties west of the proposed Fox 3 site are located within Town of Kaukauna, zoned for Light Industrial use, and subject to the following requirements:
 - Future impacts from the project must to be 70 dBA or less at the property lines; and
 - Construction noise is exempt from the noise ordinance.



- | | |
|--|---|
|  Fox Energy Center Approximate Property Boundary | Town of Kaukauna |
|  Business - 65 dBA |  Commercial - 70 dBA |
|  Agriculture - 65 dBA |  Agricultural - 70 dBA |
|  Industrial - 65 dBA |  Light Industrial - 70 dBA |
|  Residential - 65 dBA |  Residential - 70 dBA |

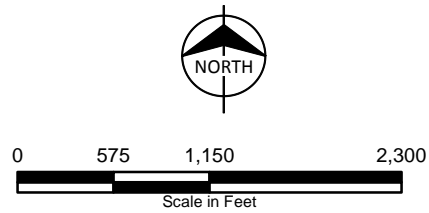


Figure 3-1
 Project Location
 Zoning and Noise Limits
 of Surrounding Area

4.0 EXISTING NOISE ENVIRONMENT

Ambient sound measurements were conducted according to the PSCW's Protocol. The Protocol requires measurements be taken at specific points while the existing facility is non-operational and fully operational. Overall dBA and dBC sound levels are required to be reported for L_{ave} , L_{10} , L_{50} , and L_{90} for both the non-operational and operational measurements. Un-weighted octave-band sound levels are also to be reported for the non-operational and operational measurements.

Sound level measurements were made at seven locations around the existing Fox Energy Center, near homes and other sensitive areas (MP01-MP07), as shown in Figure 4-1. These locations were selected in accordance with PSCW's Protocol. The locations were deemed to be representative of the existing environmental conditions at sensitive receivers around the Fox 3 site, were spaced evenly around the site, and were accessible.

Measurements were taken using a Larson-Davis Model 831 Type I sound level meter. The sound level meter was calibrated before and after each set of measurements. None of the calibration level changes exceeded ± 0.1 dB. A windscreen was used at all times on the meter, and the meter was mounted on a tripod, approximately 5 feet above ground, with the microphone directed toward the site of the proposed Fox 3.

Sound levels at each frequency were measured for 10 minutes and logged by the sound level meter at each location. The sound levels varied at each measurement point depending on the proximity to equipment at the facility and the extraneous sounds that occurred during each measurement. The measurement points were located at approximately the same elevation as the proposed Fox 3 site.



Measurement Points



Fox Energy Center Approximate Property Line

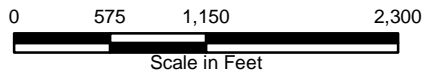


Figure 4-1
Measurement Locations

4.1 Noise Environment without Existing Facility Operating (Non-Operational)

On July 15, 2014, between the hours of 10 P.M. and 12 A.M., and again on July 16, 2014, from 6 A.M. and 8 A.M., 12 P.M. and 2 P.M., 6 P.M. and 8 P.M., Burns & McDonnell personnel obtained environmental sound level measurements while the existing Fox Energy Center was non-operational. Measurements were taken to establish how sound in the area of the proposed Fox 3 location fluctuates without the influence of the existing Fox Energy Center. These sound level measurements provide the quietest sound levels experienced by abutting residences.

The non-operational data is provided in Appendix B and is for informational purposes only. The Village of Wrightstown Ordinance defines ambient noise as, “the all-encompassing noise associated with a given source, usually being a composite of sounds with many sources near and far, but excluding the noise source being measured.” Therefore, the baseline ambient sound levels would include the existing facility and are established in Section 4.2.

4.2 Noise Environment with Existing Facility Operating

On July 22, 2014, between the hours of 6 A.M. and 8 A.M., 12 P.M. and 2 P.M., 6 P.M. and 8 P.M., and 10 P.M. and 12 A.M., Burns & McDonnell personnel obtained environmental sound level measurements while the existing Fox Energy Center was operating to establish baseline, ambient sound levels in the area of the proposed Fox 3 location. The land use immediately surrounding the Fox Energy Center is mostly agricultural and residential. There are housing developments southwest and northeast of Fox Energy Center, and there are a few rural residences located adjacent to the facility fence line.

Weather conditions were favorable for conducting ambient sound measurements during all survey periods. Approximate meteorological conditions were measured using a hand-held device and are presented in Table 4-1.

Table 4-1: Meteorological Conditions during Operational Noise Measurements

Date	Time Period	Temperature (°F)	Relative Humidity (%)	Wind Speed (mph)	Sky Cover
July 22, 2014	6 A.M. to 8 A.M.	76	76	1-7	Partly cloudy
July 22, 2014	12 P.M. to 2 P.M.	88	59	1-7	Mostly clear
July 22, 2014	6 P.M. to 8 P.M.	90	45	1-8	Mostly clear
July 22, 2014	10 P.M. to 12 A.M.	74	59	1-10	Mostly clear

Extraneous noises during operational measurement periods included noise associated with vehicular traffic, noise from the existing Fox 1 and 2 at Fox Energy Center, insects, birds, and occasional trains and airplanes passing. A summary of the extraneous noises are presented in Table 4-2. Operational A-weighted and C-weighted L_{ave} , L_{10} , L_{50} and L_{90} sound levels are shown in Table 4-3. A-weighted L_{ave} sound levels varied from a low of 50 dBA at MP05 during the nighttime to a high of 70 dBA at MP02 during the morning. C-weighted L_{ave} sound levels varied from a low of 60 dBA at MP04 during the nighttime to a high of 79 dBA at MP01 during the morning. Operational un-weighted octave band data is presented Table 4-4. At most of the measurement points, the loudest sound levels can be attributed to vehicular traffic on nearby roads. At MP01 (near the Fox 1 and Fox 2 stacks at Fox Energy Center), the dominant noise is from the combustion turbines and other facility equipment.

Table 4-2: Extraneous Noises during Operational Measurements

Time Period	Measurement Point	Extraneous Noises
6 A.M. to 8 A.M.	MP01	Facility dominant, birds, noise from workers, traffic on US 41 audible
	MP02	Facility clearly audible when traffic subsides, traffic on dominant, wind in trees/grass, insects
	MP03	Facility dominant, traffic on US 41 audible, birds, wind in trees/grass
	MP04	Facility barely audible, distant traffic on US 41 audible, leaves in trees, winds blowing from facility towards MP, light precipitation, wind noise dominated
	MP05	Facility not audible, traffic on US 41, leaves in trees, wind noise, birds
	MP06	Facility distinguishable when traffic subsides, traffic on US 41 dominant, light winds with a few large gusts
	MP07	Busy traffic on US 41 dominant, birds, winds from south toward Fox Energy Center
12 P.M. to 2 P.M.	MP01	Facility dominant, delivery truck backing up near MP,
	MP02	Facility audible, traffic dominant with close large trucks
	MP03	Facility dominant, traffic on US 41 audible, motorcycle, large trucks
	MP04	Facility barely audible, traffic on US 41 distinguishable, windy, leaves in trees, birds
	MP05	Facility barely audible, traffic on US 41 dominant, scooter and truck close by, birds, wind chime
	MP06	Facility barely audible, traffic on US 41 dominant
	MP07	Facility barely audible, traffic on US 41 dominant and constant, close by traffic, large trucks
6 P.M. to 8 P.M.	MP01	Facility dominant, wind in trees/grass
	MP02	Facility audible when traffic subsides, traffic on nearby road dominant
	MP03	Facility audible, traffic on US 41 dominant, wind in trees/grass, insects
	MP04	Facility audible when traffic subsides, traffic on US 41 dominant without wind, leaves in trees dominant, distant car drove off
	MP05	Facility barely audible, traffic on US 41 dominant, birds, delivery truck nearby
	MP06	Facility barely audible when traffic subsides, traffic dominant, leaves in trees, birds, plane overhead not visible
	MP07	Traffic on US 41 dominant, birds, cars nearby

Table 4 2: Extraneous Noises during Operational Measurements (cont.)

10 P.M. to 12 A.M.	MP01	Facility dominant, wind in trees/grass
	MP02	Facility dominant, light close traffic
	MP03	Facility dominant, light traffic, large truck
	MP04	Facility inaudible, leaves in trees, traffic is light but still audible
	MP05	Facility inaudible, traffic dominant, wind in leaves, wind chimes, mailboxes rattle
	MP06	Facility clearly audible, traffic causes high noise, train started, train horn
	MP07	Facility audible, light traffic, train horn

Table 4-3: Existing Operational Ambient Noise Levels

Time Period	Measurement Point Locations	Sound Level Statistics A-weighted Sound Level (dBA)				Sound Level Statistics C-weighted Sound Level (dBC)			
		L _{ave}	L ₁₀	L ₅₀	L ₉₀	L _{ave}	L ₁₀	L ₅₀	L ₉₀
6 A.M. to 8 A.M.	MP01	67	67	67	66	79	80	79	77
	MP02	70	74	62	57	77	78	72	69
	MP03	57	59	56	54	67	68	65	63
	MP04	56	58	55	53	67	69	65	62
	MP05	59	60	59	57	73	76	70	66
	MP06	62	64	62	60	69	71	68	65
	MP07	57	59	56	54	72	75	66	61
12 P.M. to 2 P.M.	MP01	68	68	68	68	79	80	79	77
	MP02	66	69	58	56	74	75	72	70
	MP03	56	58	55	52	67	68	65	63
	MP04	54	56	54	52	66	68	64	62
	MP05	57	59	57	55	71	73	69	65
	MP06	61	63	61	58	68	70	67	64
	MP07	57	59	56	53	66	69	63	58
6 P.M. to 8 P.M.	MP01	67	68	68	67	79	80	79	78
	MP02	65	69	59	57	74	75	72	71
	MP03	55	57	55	53	67	69	65	62
	MP04	53	54	52	51	65	68	63	60
	MP05	56	58	55	53	68	70	64	60
	MP06	60	62	60	57	71	73	67	63
	MP07	58	60	57	55	64	66	62	60
10 P.M. to 12 A.M.	MP01	69	69	69	68	79	81	79	78
	MP02	60	59	58	57	73	74	73	71
	MP03	54	56	53	51	67	69	64	60
	MP04	52	54	51	48	60	63	59	57
	MP05	50	53	50	46	65	68	62	56
	MP06	53	56	52	47	65	68	64	61
	MP07	51	54	50	48	63	65	60	57

Table 4-4: Operational Un-weighted Octave Band Data

Time Period	Measurement Point	Frequency (Hz)									
		16.0	31.5	63.0	125	250	500	1,000	2,000	4,000	8,000
6 A.M. to 8 P.M.	MP01	81.1	75.0	75.9	67.5	62.9	62.5	61.1	59.8	57.3	51.7
	MP02	76.3	71.0	72.1	69.4	64.2	65.4	67.2	62.8	55.4	49.4
	MP03	65.6	63.1	63.2	58.3	48.7	52.9	53.8	48.5	46.3	43.3
	MP04	70.6	65.4	60.1	50.8	50.7	51.1	50.5	48.1	49.3	44.9
	MP05	77.2	70.9	65.0	57.6	51.0	54.7	56.5	49.4	40.8	39.6
	MP06	67.2	66.3	63.6	56.2	51.2	55.6	59.9	54.7	43.2	39.3
	MP07	76.7	70.1	61.9	56.9	46.9	51.3	54.4	47.5	43.4	42.1
12 P.M. to 2 P.M.	MP01	80.9	75.2	74.8	68.0	64.9	64.3	62.5	60.9	58.0	52.4
	MP02	73.2	71.0	69.2	66.1	60.1	62.8	63.2	58.2	50.3	46.3
	MP03	65.5	63.0	63.3	60.4	50.3	51.0	52.1	46.7	43.6	43.1
	MP04	68.0	63.8	59.0	49.3	48.7	50.0	49.3	45.3	46.2	42.8
	MP05	74.4	68.8	63.2	53.8	47.3	53.5	55.0	47.4	39.4	39.5
	MP06	65.5	65.6	63.5	56.9	48.3	55.3	59.0	53.1	42.2	39.6
	MP07	68.9	63.8	59.7	54.0	48.5	52.8	54.6	47.3	41.7	41.3
6 P.M. to 8 P.M.	MP01	81.3	75.3	76.0	67.5	64.1	63.2	62.2	60.6	57.7	51.1
	MP02	74.3	71.1	69.1	63.1	59.7	59.1	61.4	58.4	49.8	43.8
	MP03	70.1	64.1	60.4	56.5	46.9	50.2	49.8	46.7	48.1	47.5
	MP04	68.7	63.4	57.1	47.3	47.0	48.5	48.4	44.3	44.5	42.0
	MP05	71.8	66.0	59.7	56.1	46.7	51.2	53.5	46.4	37.9	39.1
	MP06	74.5	68.2	62.9	56.7	46.3	53.7	58.1	52.6	41.9	39.6
	MP07	63.0	60.5	57.1	52.9	49.8	54.0	55.9	47.8	40.6	40.8
10 P.M. to 12 A.M.	MP01	81.9	76.0	74.4	71.3	65.8	65.1	63.2	61.7	58.7	52.1
	MP02	75.3	71.9	67.5	57.5	56.6	56.4	56.6	52.6	43.5	41.0
	MP03	70.7	64.5	59.1	50.1	44.7	46.5	46.6	45.7	48.3	47.7
	MP04	61.7	58.8	54.1	43.8	43.3	45.7	45.8	44.3	45.5	42.3
	MP05	70.2	62.9	56.0	47.3	42.9	45.4	48.4	42.1	36.9	38.9
	MP06	64.9	64.0	61.1	54.3	43.1	48.0	50.5	46.4	37.9	38.8
	MP07	64.7	60.6	56.9	48.9	47.5	48.0	48.9	42.2	38.3	40.5

5.0 PREDICTED OPERATIONAL NOISE LEVELS

Using industry-accepted noise modeling software, the expected operational project noise levels were predicted for areas in and around Fox 3. The program used for this project was the Computer Aided Design for Noise Abatement (CadnaA), Version 4.4.145, published by DataKustik, Ltd., Munich, Germany. The CadnaA program is a scaled, three-dimensional program which takes into account each piece of noise-emitting equipment on the Fox 3 site and predicts future noise levels. The model calculates noise propagation based on ISO 9613-2:1996, General Method of Calculation. ISO 9613-2 assesses the sound levels based on the octave band center frequency range from 31.5 to 8,000 Hz.

Appropriate sound emissions were applied for sound radiating surfaces and points. Sources were modeled as one of four categories: points, areas, vertical areas, or lines. The specific category partially determined how the source would radiate sound within the noise model. Reflections were considered when sound encountered a physical structure. The atmospheric conditions were assumed to be calm and the temperature and relative humidity were set to 50 degrees Fahrenheit and 70 percent, respectively (based on program defaults). Standard absorption was considered for all on-site and off-site areas. The planned earthen landscape berm has been included in the model along the north property line.

Applicable noise ordinances consider total noise and, therefore, the ambient, operational noise levels need to be taken into consideration. The average of the existing L_{90} ambient levels, taken while the plant was in operation, are considered representative of the existing Fox Energy Center sound levels and were incorporated as a source into the noise model. The existing Fox Energy Center noise was thereby added to the predicted values to examine future compliance with the applicable noise ordinances.

5.1 Unmitigated Operational Noise Levels

In order to evaluate the expected noise levels from the proposed Fox 3, noise data for sources to be located on-site were obtained and the equipment modeled. The equipment manufacturers for the cooling tower, steam turbine, gas turbine, and auxiliary equipment provided equipment sound power and pressure levels. Sound level data sheets used for this study are provided in Appendix C. The sound levels provided for the gas turbine, steam turbine, auxiliary equipment, and cooling tower are considered unmitigated sources. Other noise sources were assumed based on historical data. A summary of all sound power levels incorporated into the model have also been included in Appendix C. The major equipment's unmitigated sound levels are given in Table 5-1 below.

Table 5-1: Unmitigated Sound Pressure Level for Major Noise Components

Equipment	Unmitigated Sound Levels at 400 feet (dBA)
HRSG (stack exit and casing)	65
Steam turbine building.	65
Cooling tower	65
Gas compressor enclosure	59
Turbine diffuser	45

Fox 3 currently has two layout options, referred to as Site Option 1 and Site Option 2. Site Option 1 has the Fox 3 site located in the center of the existing Fox Energy Center property, while Site Option 2 has the Fox 3 site located in the southeast corner of the existing property. Additionally, there are two gas turbine configuration options. The Fox 3 would utilize either a GE 7FA or a Siemens SGT6-5000F gas turbine. Each layout option was modeled with the GE and Siemens turbine configurations, for a total of four scenarios. The modeling layouts and receiver locations are presented in Figures D-1 and D-2 found in Appendix D.

5.1.1 Site Option 1 Layout

In order to predict the total sound level impacts at surrounding residences and sensitive areas, the sound predictions for this project were added to existing Fox Energy Center sound levels. The cumulative noise levels were compared to the applicable noise limit at each receiver location. These values are shown in Table 5-2 for the GE turbine configuration and Table 5-3 for the Siemens turbine configuration.

Table 5-2: Unmitigated Sound Levels (dBA) Site Option 1 with GE Turbine

Receiver Number	Existing Plant Sound Level (dBA)	Predicted Fox 3 Sound Level (dBA)	Total Sound Level (dBA)	Applicable Criteria Total Sound Level (dBA)
MP01	66	44	66	70
MP02	56	49	57	70
MP03	51	57	58	70
MP04	48	60	61	70
MP05	46	54	54	65
MP06	47	60	60	65
MP07	48	45	50	70

Table 5-3: Unmitigated Sound Levels (dBA) Site Option 1 with Siemens Turbine

Receiver Number	Existing Plant Sound Level (dBA)	Predicted Fox 3 Sound Level (dBA)	Total Sound Level (dBA)	Applicable Criteria Total Sound Level (dBA)
MP01	66	43	66	70
MP02	56	48	57	70
MP03	51	57	58	70
MP04	48	60	61	70
MP05	46	53	54	65
MP06	47	60	60	65
MP07	48	44	49	70

Table 5-2 and Table 5-3 show that the maximum total A-weighted sound level emitted from the existing Fox Energy Center is 66 dBA at MP01, located south of the property. Sound at this location is mainly associated with the existing facility. Figure E-1 and Figure E-2 show the noise contours for the Site Option 1 layout with each turbine configuration without the noise contributions from the existing Fox Energy Center. Figure E-3 and Figure E-4 show the noise contours for the Site Option 1 layout with each Fox 3 turbine configuration plus the noise contributions from the existing Fox Energy Center.

An analysis of the entire property line was performed by comparing the noise contours to the property line limits. Noise at areas northwest of the Fox 3 site could exceed the Village of Wrightstown criteria of 65 dBA. Noise levels in this area are predominantly predicted levels associated with the Fox 3. Mitigation would be required to bring sound levels into compliance at the northwestern property line. All other property lines are in compliance with applicable criteria.

PSCW's Protocol requires A-weighted and C-weighted noise levels from the all units be estimated at 100, 400, 1,000, 1,500, 2,000, and 3,000 feet from the noise source with the greatest sound level. These values are for informational purposes only and are not required by any applicable ordinance for determining future compliance.

Table 5-4 provides this information for the unmitigated Site Option 1 layout with either GE or Siemens gas turbine configurations.

**Table 5-4: Unmitigated Total Plant Sound Levels (dBA)
Site Option 1 with GE or Siemens Turbine**

Reference Distance	GE Turbine		Siemens Turbine	
	Total Plant (dBA)	Total Plant (dBC)	Total Plant (dBA)	Total Plant (dBC)
100	76	84	76	84
400	68	79	68	80
1,000	62	75	62	75
1,500	59	73	59	73
2,000	57	71	57	71
3,000	53	68	53	68

5.1.2 Site Option 2 Layout

In order to predict the total sound level impacts at surrounding residences and sensitive areas, the sound predictions for Fox 3 were added to existing Fox Energy Center sound levels. The sound levels are based on Site Option 2 layout with the GE and Siemens turbine configurations. The cumulative noise levels were compared to the applicable noise limit at each property line. These values are shown in Table 5-5 for the GE turbine configuration and Table 5-6 for the Siemens turbine configuration.

Table 5-5: Unmitigated Sound Levels (dBA) Site Option 2 with GE Turbine

Receiver Number	Existing Plant Sound Level (dBA)	Predicted Fox 3 Sound Level (dBA)	Total Sound Level (dBA)	Applicable Criteria Total Sound Level (dBA)
MP01	66	57	67	70
MP02	56	54	58	70
MP03	51	64	65	70
MP04	48	63	63	70
MP05	46	50	51	65
MP06	47	55	56	65
MP07	48	45	50	70

Table 5-6: Unmitigated Sound Levels (dBA) Site Option 2 with Siemens Turbine

Receiver Number	Existing Plant Sound Level (dBA)	Predicted Fox 3 Sound Level (dBA)	Total Sound Level (dBA)	Applicable Criteria Total Sound Level (dBA)
MP01	66	57	67	70
MP02	56	54	58	70
MP03	51	64	64	70
MP04	48	62	63	70
MP05	46	49	51	65
MP06	47	55	56	65
MP07	48	44	50	70

Table 5-4 and Table 5-5 show that the maximum total A-weighted sound level emitted from the existing Fox Energy Center facility is 67 dBA at MP01, located south of the property. Sound at this location is mainly associated with the existing facility. Figure E-5 and Figure E-6 show the noise contours for the Site Option 2 layout with each turbine configuration without the noise contributions from the existing Fox Energy Center. Figure E-7 and Figure E-8 show the noise contours for the Site Option 2 layout with each Fox 3 turbine configuration plus the noise contributions from the existing Fox Energy Center.

An analysis of the entire property line was performed, and noise at all property lines would be in compliance with the applicable noise limits. Mitigation would not be required for the Site Option 2 layout for either turbine configuration.

PSCW's Protocol requires A-weighted and C-weighted noise levels from the all units be estimated at 100, 400, 1,000, 1,500, 2,000, and 3,000 feet from the noise source with the greatest sound level. These values are for informational purposes only and are not required by any applicable ordinance for determining future compliance. Table 5-7 provides this information for the unmitigated Site Option 2 layout with either GE or Siemens gas turbine configurations.

Table 5-7: Unmitigated Total Plant Sound Levels (dBA) Site Option 2 with GE or Siemens Turbine

Reference Distance	GE Turbine		Siemens Turbine	
	Total Plant (dBA)	Total Plant (dBC)	Total Plant (dBA)	Total Plant (dBC)
100	76	84	76	84
400	68	79	68	79
1,000	62	75	62	76
1,500	59	72	59	74
2,000	57	70	56	72
3,000	53	67	53	69

5.2 Tonal Noise

The generators, transformers, and gas turbine auxiliary equipment may produce tonal noise. These elements would be addressed during detailed design of the Fox 3 to avoid prominent tonal noise impacts to the noise-sensitive receptors. The tonal noise sources would be mitigated such that they would not be the primary noise sources. Therefore, tonal emissions would not be distinctly audible at any sensitive receptors. During normal steady state operations, the noise from the proposed Fox 3 would be predominantly broadband noise.

5.3 Construction Noise Levels

The Village of Wrightstown Noise Ordinance limits construction noise to 80 dBA at the property line between the hours of 7 A.M. and 9 P.M. The north and northwest property lines are in the Village of Wrightstown and therefore must meet these standards. Sources of construction noise include increased traffic to and from the construction site, equipment deliveries, contractor's equipment, and boiler and steam turbine venting during initial testing, start-up, or malfunction.

Noise from construction equipment is typically high-intensity, intermittent, and impulsive type of sound. Impulsive sounds are short duration, typically less than 1 second. Impulsive, high-intensity sounds are noticeable especially when they are introduced into residential settings. The primary noise sources at a construction site are likely the diesel-engine drive systems that power most construction equipment. Typical construction noises for a power plant project are listed in Table 5-8.

Table 5-8: Typical Construction Equipment Noise Levels (dBA)

Generic Construction Equipment	Minimum Noise at 50 feet	Maximum Noise at 50 feet
Backhoes	74	92
Compressors	73	86
Concrete mixers	76	88
Cranes (movable)	70	94
Dozers	65	95
Front loaders	77	96
Generators	71	83
Graders	72	91
Jack hammers and rock drills	80	98
Pumps	69	71
Scrapers	76	95
Trucks	83	96

Source: FHWA Highway Construction Noise and the HEARS database

An important and potentially significant source of noise during construction would result from increases in construction traffic along the roads leading to and from the site. Traffic noise associated with construction traffic would occur around the starting and quitting times of the construction craft labor when auto traffic would be at its peak. The amount of added traffic would depend on the phase of construction. The traffic would start moderately and continue to increase until the peak period of construction. Truck traffic caused by material deliveries would have a lesser impact as these deliveries are typically intermittently spread throughout the day, except when truck traffic increases for a given day due to a special construction process.

Site Option 1 and Site Option 2 layouts involve construction areas and entrances near the north and northwest property lines. It is anticipated that unmitigated construction and construction traffic noise could exceed the Village of Wrightstown limit of 80 dBA at the critical property lines for short durations during construction hours. WPS will work with the Village of Wrightstown to develop an appropriate strategy to manage the construction noise to meet the requirements of the Village of Wrightstown noise ordinance once detailed planning of construction logistics begins. Mitigation may include requirements such as temporary noise barriers, all engines to be equipped with mufflers, and scheduled times for deliveries.

5.4 Steam Blows for Plant Start Up

Steam blows have the potential to significantly increase sound levels in the area of the Fox Energy Center during their temporary operation. Because these are not long-term sources of noise, their impact is expected to be minimal. WPS will provide notice to nearby residents of expected timeframes for steam blow operation.

6.0 NOISE MITIGATION AND PROCEDURES

Total facility sound levels for the Site Option 1 layout with either gas turbine configuration exceed the Village of Wrightstown criteria at the northwestern property line according to the noise contours. Total facility sound levels for the Site Option 2 layout would not exceed the applicable property line criteria. Therefore, mitigation would be required to reduce sound levels at the northwestern property line for Site Option 1 layout only.

6.1 Site Option 1 Layout

In order to reduce the noise levels at each measurement point for the Site Option 1 layout, the Heat Recovery Steam Generator (HRSG) and steam turbine building would require additional noise attenuation to achieve the applicable noise criteria at all property lines. This mitigation would likely be in the form of a stack silencer and increased casing thickness for the HRSG, and high-performance acoustical building materials for the steam turbine. The mitigation criteria for both GE and Siemens turbine configurations are the same; however, the mitigation methods and equipment may be different. The critical equipment would need to meet the noise levels are listed in Table 6-1, in order to meet the overall Fox 3 criteria.

Table 6-1: Mitigated Sound Pressure Levels for Major Noise Components

Equipment	Mitigated Sound Levels at 400 Feet (dBA)
HRSG (Stack Exit + Casing)	60
Steam Turbine Building.	60

The equipment mitigated to the noise levels listed in Table 6-1 were entered into the model and added to the existing Fox Energy Center noise levels and other unmitigated noise sources. The total mitigated Fox Energy Center levels were compared to the applicable noise limit for each property line. Mitigated sound levels are shown in Table 6-2 for the GE turbine and in Table 6-3 for the Siemens turbine.

Table 6-2: Mitigated Total Plant Sound Levels (dBA) Site Option 1 with GE Turbine

Receiver Number	Existing Plant Sound Level (dBA)	Predicted Fox 3 Sound Level (dBA)	Total Sound Level (dBA)	Applicable Criteria Total Sound Level (dBA)
MP01	66	59	67	70
MP02	56	57	59	70
MP03	51	66	66	70
MP04	48	63	63	70
MP05	46	52	53	65
MP06	47	56	57	65
MP07	48	49	51	70

Table 6-3: Mitigated Total Plant Sound Levels (dBA) Site Option 1 with Siemens Turbine

Receiver Number	Existing Plant Sound Level (dBA)	Predicted Fox 3 Sound Level (dBA)	Total Sound Level (dBA)	Applicable Criteria Total Sound Level (dBA)
MP01	66	59	67	70
MP02	56	57	59	70
MP03	51	66	66	70
MP04	48	63	63	70
MP05	46	52	53	65
MP06	47	56	57	65
MP07	48	49	51	70

Table 6-2 and Table 6-3 show that the maximum predicted A-weighted sound levels emitted from the existing facility plus Fox 3 would be 67 dBA at MP01, located south of the Fox 3 site. Figure E-9 and Figure E-10 show the mitigated noise contours for the Site Option 1 layout with each turbine configuration in addition to the noise contributions from the existing Fox Energy Center. After the incorporation of suggested mitigation, total sound levels comply with the applicable criteria at all property lines.

PSCW's Protocol requires A-weighted and C-weighted noise levels from the all units be estimated at 100, 400, 1,000, 1,500, 2,000, and 3,000 feet from the noise source with the greatest sound level. These values are for informational purposes only and are not required by any applicable ordinance for determining future compliance. Table 6-3 provides this information for the mitigated Site Option 1 layout with either GE or Siemens gas turbine configurations.

Table 6-4: Unmitigated Sound Levels (dBA) Site Option 1 with GE and Siemens Turbine

Reference Distance	GE Turbine		Siemens Turbine	
	Total Plant (dBA)	Total Plant (dBC)	Total Plant (dBA)	Total Plant (dBC)
100	75	83	75	83
400	67	77	67	78
1,000	60	73	60	73
1,500	57	71	57	71
2,000	55	69	55	70
3,000	51	66	51	66

6.2 Site Option 2 Layout

No mitigation would be required for the Site Option 2 layout with either the GE or Siemens turbine.

7.0 CONCLUSION

Burns & McDonnell was contracted by WPS to conduct a facility noise assessment study for the proposed construction of Fox 3. The proposed Fox 3 would be a combined-cycle power plant addition at the existing Fox Energy Center located in Wrightstown, WI. Adjacent properties are located in the Village of Wrightstown and Town of Kaukauna, WI. The existing facility consists of two combined-cycle units. The proposed Fox 3 would be permitted to operate 24 hours per day, 365 days per year, but would operate in accordance with market dispatch signals.

Burns & McDonnell reviewed applicable federal, state, county, and municipal sound regulations for the Fox 3 site. The applicable design criteria for each adjacent property line is as follows:

- Adjacent Properties to the South and East of property are located within Town of Kaukauna and are zoned for Exclusive Agricultural use.
 - Future impacts from the project are to be 70 dBA or less at the property lines.
 - Construction noise is exempt from noise ordinance.
- Adjacent Properties to the West of property are located within Town of Kaukauna and are zoned for Light Industrial use and are subject to the following requirements:
 - Future impacts from the project are to be 70 dBA or less at the property lines.
 - Construction noise is exempt from noise ordinance.
- Adjacent Properties to the North and Northwest of property are located within Village of Wrightstown and are subject to the following requirements:
 - Future impact are 65 dBA or less at adjacent property lines;
 - If primary noise sources are tonal in nature the residential criteria is reduced by 5 dB;
 - Construction noise shall not exceed 80 dBA at the property line, and must be between the hours of 7 A.M. and 9 P.M.

Environmental sound level measurements were obtained for both operational and non-operational conditions at the existing Fox Energy Center. These existing noise measurements established baseline, ambient sound levels in the area of the Fox 3 location. The measurements were taken according the PSCW's Protocol. The measured existing L₉₀ ambient levels were considered to be representative of the existing Fox Energy Center sound levels and were incorporated into the noise model. The existing noise was added to the predicted values to determine compliance with the applicable noise regulations.

Using CadnaA, the expected, operational project noise levels were predicted for areas in and around the Fox 3 site.

The proposed Fox 3 currently has two layout options, referred to as Site Option 1 and Site Option 2. Site Option 1 has the Fox 3 site located in the center of the Fox Energy Center property, while Site Option 2 has the Fox 3 site located in the southeast corner of the property. Additionally, there are two gas turbine configuration options. Fox 3 would utilize either a GE 7FA or Siemens SGT6-5000F gas turbine. Each layout option was modeled in CadnaA using the GE and Siemens turbine configurations.

Modeled results for the unmitigated Site Option 1 layout, with either GE or Siemens gas turbines, show total A-weighted sound levels emitted from the facility that would exceed the Village of Wrightstown noise limit along the property line. Site Option 1 could meet the Town of Kaukauna limits without further mitigation. Mitigation for Fox 3 would be required to bring sound levels into compliance at all property lines. To do this, additional stack silencing and HRSG casing treatments would likely be required for Site Option 1. Additionally, buildings housing loud equipment, such as the steam turbine, should be acoustically treated to provide sufficient abatement of the interior sources.

Modeled results for the unmitigated Site Option 2 layout, with either GE or Siemens gas turbines, show a total A-weighted sound level emitted from the facility that would not exceed either of the Town of Kaukauna or Village of Wrightstown noise limits.

**APPENDIX A - VILLAGE OF WRIGHTSTOWN AND TOWN OF KAUKAUNA
NOISE ORDINANCES**

Village of Wrightstown, WI
Monday, October 6, 2014

Chapter 139. PEACE AND GOOD ORDER

§ 139-6. Loud and unnecessary noise prohibited.

[Amended 8-17-2004 by Ord. No. 08172004]

- A. It shall be unlawful for any person to make, continue or cause to be made or continued any loud and unnecessary noise.
- (1) Types of loud and unnecessary noises. The following acts are declared to be loud, disturbing and unnecessary noises in violation of this section, but this enumeration shall not be deemed to be exclusive:
- (a) Horns, signaling devices. The sounding of any horn or signaling device on any automobile, motorcycle or other vehicle on any street or public place in the Village for longer than three seconds in any period of one minute or less, except as a danger warning; the creation of any unreasonable loud or harsh sound by means of any signaling device and the sounding of any plainly audible device for an unnecessary and unreasonable period of time; the use of any signaling device except one operated by hand or electricity; the use of any horn, whistle or other device operated by engine exhaust and the use of any signaling device when traffic is for any reason held up.
- (b) Radios, phonographs, similar devices. The using, operating or permitting to be played, used or operated any radio receiving set; musical instrument, phonograph or other machine or device for the producing or reproducing of sound in a loud and unnecessary manner. The operation of any set, instrument, phonograph, machine or device between the hours of 10:00 p.m. and 7:00 a.m. in a manner as to be plainly audible at the property line of the building, structure or vehicle in which it is located shall be prima facie evidence of a violation of this section.
- (c) Loudspeakers, amplifiers for advertising. The using, operating or permitting to be played, used or operated of any radio receiving set, musical instrument, phonograph, loudspeaker, sound amplifier or other machine or device for the producing or reproducing of sound which is cast upon the public streets for the purpose of commercial advertising or attracting attention of the public to any building or structure. Announcements over loudspeakers can only be made

by the announcer in person and without the aid of any mechanical device.

- (d) Exhausts. The discharge into the open air of the exhaust of any steam engine, stationary internal combustion engine or motor boat except through a muffler or other device which will effectively prevent loud or explosive noises therefrom.
 - (e) Construction or repair of buildings. The erection (including excavation), demolition, alteration or repair of any building, as well as the operation of any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist, or any other similar equipment attended by loud or unusual noise, other than between the hours of 7:00 a.m. and 9:00 p.m. on weekdays; provided, however, the Chief of Police shall have the authority, upon determining that the loss of inconvenience which would result to any party in interest would be extraordinary and of such nature as to warrant special consideration, to grant a permit for a period necessary within which time such work and operation may take place within the hours of 10:00 p.m. and 7:00 a.m.
 - (f) Schools, courts, churches. The creation of any excessive noise on any street adjacent to any school, institution of learning, church or court while in use, which unreasonably interferes with the normal operation of that institution, provided that conspicuous signs are displayed in those streets indicating a school or court.
 - (g) The provisions of this section shall not apply to:
 - [1] Any vehicle of the Village while engaged in necessary public business.
 - [2] Excavations or repairs of streets or other public construction by or on behalf of the Village, county, or state at night when public welfare and convenience renders it impossible to perform such work during the day.
 - [3] The reasonable use of amplifiers or loudspeakers in the course of public addresses which are noncommercial in nature.
- (2) Stationary noise limits.
- (a) Maximum permissible sound levels.
 - [1] Noise from a stationary source shall not exceed the following standards for maximum sound pressure levels measured at the property line:

Zone	Noise Rating -	
	Daytime	Noise Rating - Nighttime
Residential	75 db	65 db
Commercial	85 db	75 db
All other zones	75 db	75 db

- [2] Ambient noise is the all-encompassing noise associated with a given source, usually being a composite of sounds with many sources near and far, but excluding the noise source being measured. Ambient noise is a factor and the subject noise shall not exceed the ambient noise by 5 db in any octave band to be designated excessive.
- [3] Pure tones and impulsive noises are factors. Five noise rating numbers shall be taken from the table as listed in Subsection **A(2)(a)[1]**, if the subject noise consists primarily of a pure tone or if it is impulsive in character.
- (b) Construction noise. Construction equipment in any zone may be operated between the hours of 7:00 a.m. and 9:00 p.m., provided that said equipment does not exceed a maximum sound level of 80 db(a) measured at the property line of the location at which said equipment is in use.
- (c) Noise in residential districts. In residential zones, the person in violation of this section shall be ordered to reduce the sound pressure to acceptable levels immediately by the monitoring officer.
- (d) Operation of certain equipment. Lawnmowers, chainsaws, powered garden equipment, snowblowers, electric insect killing/repelling devices, and other nonconstruction maintenance equipment shall be operated only during the hours of 7:00 a.m. and 9:00 p.m. unless within the specified noise levels measured at the property line of the location at which said equipment is in use.
- (e) Exemptions. Operations of emergency equipment shall be exempt from this chapter. Snowblowers not operated on a commercial basis shall be exempt from this chapter when used to gain access to a Village street. Emergency equipment shall include ambulance, police, fire, snow removal, civil defense sirens, etc., necessary for the health, safety, and protection of the citizens of the Village.
- (f) Methods of measuring noise.
- [1] Noise levels shall be made with a sound level, or decibel, meter.
- [2] Noise measurement shall be made at the nearest lot line of the premises from which a noise complaint is received. The decibel meter shall be placed at a height of at least three feet above the ground and at least three feet away from walls, barriers, obstructions, and all other sound-reflective surfaces.
- (g) Appeals. The Village Board may grant an exemption to individuals proving evidence of substantial hardship. Evidence that reasonable technological attempts have been made to correct the problem shall be considered grounds

for granting an exemption to this chapter for existing industries.

- (3) Permits for amplifying devices.
 - (a) Permit required. The use of loudspeakers or amplifying devices on the streets or in the parks of the Village of Wrightstown is prohibited unless the party desiring to use such loudspeaker or amplifying device first obtains a permit from the Village of Wrightstown.
 - (b) The Police Department shall have the authority to revoke such a permit when the belief that the loudspeaker or amplifying device is becoming a nuisance because of the volume, method in which it is being used or the location in which it is being operated.
 - (c) The Village shall not grant a permit to use a loudspeaker or amplifying device before the hours of 9:00 a.m. or after 11:00 p.m. No permit shall be granted to anyone who, in the opinion of the Police Department, uses said loudspeaker or amplifying device in such a manner or for such a purpose as to constitute a nuisance.
- B. Operation of motor vehicles. No person shall operate a motor vehicle so as to cause the tires thereof to squeal, the horn to blow excessively or the motor to race excessively.

**TOWNSHIP OF KAUKAUNA, OUTAGAMIE COUNTY
ZONING ORDINANCE**

**CERTIFIED BY DATCP - ?
FURTHER AMENDED BY TOWN BOARD - SEP. 30, 2013
FURTHER AMENDED BY TOWN BOARD - SEP. 16, 2013
AMENDED BY TOWN BOARD - JUL. 8, 2013
ADOPTED BY TOWN BOARD - DEC. 9, 1991**

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9. Telecommunication Towers.

C. Height and Area

1. Height. Buildings hereafter erected or structurally altered shall exceed neither four stories nor fifty (50) feet in height.
2. Setback. Shall not be less than twenty-five (25) from all roads, alleys, and service roads except for U.S. Highway "41" and all class "A" Highways which shall require a setback of fifty-five (55) feet from the highway right-of-way line unless such highways are provided with service roads, in which case the set back shall be twenty-five (25) feet from the service road right-of-way line, otherwise as provided in Highway Setback Lines. Set backs for on premise signs shall not be less than five (5) feet from the road right of way and seventy five (75) feet from an intersection and no less than ten (10) feet from the ground in Commercial and Light Industrial District. Bill Board signs shall refer to the Bill Board Ordinance.
3. Rear Yard. There shall be a rear yard of not less than twenty-five (25) feet.
4. Side Yard. For buildings or parts of buildings hereafter erected or structurally altered for residential use, the side yard regulations of the Rural Development District shall apply. In all other cases a side yard of five feet is required unless adequate vehicle access to the rear yard is provided and is approved by the Town Board, in which case the Town Board may eliminate the side yard requirement.
5. Lot Area. For building or parts of buildings hereafter erected, moved or structurally altered for residential purposes, the lot area requirements of the Rural Development shall apply, otherwise there shall be no minimum lot area for this district.

3.9 Light Industrial District

- A. Permitted Uses. In the Light Industrial District no premises shall be used and no building shall be erected or structurally altered, unless otherwise provided in this chapter except for one or more of the following uses:

1. All uses permitted in the Commercial District.
 2. Printing and Publishing.
 3. Paper products manufacturing except for manufacture of paper.
 4. Repair, service and assembly of vehicles.
 5. Storage and warehousing, except the storage of old iron, bottles, rags or junk, or so called automobile wrecking garage or business of wrecking and parking automobile wrecks on the premises or in garages.
 6. Bottling works and non-alcoholic beverage manufacture.
 7. Food processing and packing.
 8. Contractor's storage yards.
 9. Fuel and material yards.
 10. Wood products manufacture and repair.
 11. Office, home appliance and sporting goods manufacture.
 12. Wholesale business.
 13. Leather goods manufacture.
 14. Manufacture of products from woven goods.
 15. Cleaning, dyeing, pressing and laundry establishments.
 16. Laboratories.
 17. Jewelry and cosmetic manufacture.
 18. Telecommunication Towers.
 19. Enameling and painting.
 20. Sheet metal works and tinsmith.
 21. Ice plant.
 22. Warehousing.
 23. Bakeries.
 24. Any kind of processing or treatment which is clearly incidental to the conduct of a wholesale business conducted on the premises.
 25. Power Plant.
- B. Automotive Salvage yards. No automotive salvage on the property.
- C. Height and Area. For buildings or parts of buildings hereafter erected, moved or structurally altered, the height and area requirements shall be the same as for the Commercial District.

D. Noise Ordinance. Loud Noises prohibited.

1. Purpose. Noise is a serious hazard to the public health, welfare, safety and quality of life. Continued exposure to noise above 85 decibels over time will cause hearing loss. In general, the louder the noise, the less time required before hearing loss will occur. According to OSHA standards, hearing loss begins to occur after eight (8) hours of exposure of sound at 85 decibels. In addition, noise pollution causes other health problems including increased heart rates, blood pressure, cholesterol, respiratory, digestive and mental health problems. It also negatively impacts real estate values, land use, wild life and farm animals. The citizens of the Town have a right to an environment free from excessive sound that may jeopardize their health, welfare, safety, and/or degrade their quality of life.
2. Maximum Permissible Sound Levels. No person shall exceed the maximum permissible sound levels:
 - a. Between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday. 85 decibels.
 - b. All other times, 70 decibels.
3. Sound levels measurements.
 - a. Sound levels shall be measured by a Sound Level Pressure Meter or a Decibel Meter.
 - b. Sound measurements shall be made at the nearest lot line of the premise from which a sound complaint is received.
 - c. The Meter shall be placed at a height of at least three feet above the ground and at least three feet away from walls, barriers, obstructions and all other sound reflexive surfaces.
4. Mitigation of Sound. Any person engaging in an industrial activity that produces more than 85 decibels must mitigate the sound. Methods of mitigation may include:
 - a. Design and fabrication of silencing devices for the sound producing equipment used.
 - b. Changing the design or operation of machines adding vibration control, soundproof enclosures, and/or use of sound absorbing materials.
 - c. Location of the sound producing machinery or operation as far away from the lot lines.

- d. Use of vegetative buffers such as shrubs, trees, berms to absorb sound.
 - e. Any other sound mitigation method approved by the Board of Appeals.
5. Exemption. This provision shall not be applicable to:
- a. Any Town vehicle while engaged in necessary public business.
 - b. Excavations or repairs of streets or other public construction by or on behalf of the Town, County or State.

3.10 Heavy Industrial District

- A. Permitted Uses. In the Heavy Industrial District a building or premises may be used for any use except the following:
- 1. Residential, educational and institutional uses.
 - 2. Uses which are hazardous and uses which are noxious by reason of the emission of smoke, dust, gas, odors, or noise, unless the location of such use has been approved by the Board of Adjustment after a Public hearing.
 - 3. Wrecking or storage yard, unless it shall be fenced in by a tight board fence or equal, at least eight (8) feet high and such fence shall comply with the setback regulations. The location shall be approved by the Plan Commission after a public hearing.
 - 4. Telecommunication Towers shall be permitted.
- B. Height and Area. Same as Commercial District.
- 1. Side and Rear Yards. Same as Commercial District.
 - 2. Setback. Same as Commercial District.
- C. Noise Ordinance. Loud Noises prohibited. Same as 3.9(D).

3.11 Resource Conservation Overlay

- A. Purpose. The Purpose of the overlay is to preserve, protect, enhance, and restore all significant woodlands, streams, lakes, wetlands, related scenic areas, sub marginal farm lands, and abandoned

APPENDIX B - NON-OPERATION NOISE DATA

APPENDIX B

On July 15, 2014, between the hours of 10 P.M. and 12 A.M., and on July 16, 2014, between the hours of 6 A.M. and 8 A.M., 12 P.M and 2 P.M., and 6 P.M. and 8 P.M, Burns & McDonnell personnel obtained environmental sound level measurements while the existing Fox Energy Center was non-operational to establish sound levels in the area of the Fox 3 location, which is located within the limits of the Village of Wrightstown, Wisconsin. The land use immediately surrounding the generating station is mostly agricultural and residential. There are housing developments southwest and northeast of Fox Energy Center. There are a few rural residences located adjacent to the facility fenceline.

Weather conditions were favorable for conducting ambient sound measurements during all survey periods. Approximate meteorological conditions were measured using a hand-held device and are presented in Table 1.

Table 1: Meteorological Conditions during Noise Measurements

Date	Time Period	Temperature (°F)	Relative Humidity (%)	Wind Speed (mph)	Sky Cover
July 15, 2014	10 P.M. to 12 A.M.	62	55	0-3	Partly cloudy
July 16, 2014	6 A.M. to 7 A.M.	58	65	0-4	Partly cloudy
July 16, 2014	12 P.M. to 2 P.M.	73	43	0-4	Partly cloudy
July 16, 2014	6 P.M. to 8 P.M.	73	42	0-4	Partly cloudy

Extraneous noises during the measurement periods included noise associated with the vehicular traffic, non-operational noise at Fox Energy Center, insects, birds, and occasional trains and airplanes passing. A summary of the extraneous noises present during non-operation measurements are presented in Table 2. The non-operational A-weighted and C-weighted L_{ave} , L_{10} , L_{50} and L_{90} sound levels are shown in Table 3. Non-operational un-weighted octave band data is presented in Table 4. A-weighted L_{ave} sound levels varied from a low of 46 dBA at MP03 during the nighttime to a high of 70 dBA at MP02 during the morning. C-weighted L_{ave} sound levels varied from a low of 54 dBA at MP07 during the nighttime to a high of 77 dBA at MP07 during the morning.

Table 2: Extraneous Noises during Non-Operational Measurements

Time Period	Measurement Point	Extraneous Noises
6 A.M. to 8 A.M.	MP01	Pump audible, light traffic, distant large trucks, AC compressor, HVAC System
	MP02	Traffic dominant, highway traffic constant & audible, plant pumps audible when traffic subsides, large trucks, birds/bugs
	MP03	Light traffic dominant, large trucks, insect noise
	MP04	Traffic on US 41 is dominant, light breeze in trees
	MP05	Traffic on US 41 is dominant
	MP06	Traffic on US 41 is dominant
	MP07	Traffic dominant/constant, large trucks
12 P.M. to 2 P.M.	MP01	Pump audible, cooling towers, equipment/trucks operating around plant, plane flying overhead, traffic noise from road & highway
	MP02	Busy traffic on road and highway dominant, large trucks (x3), birds chirping
	MP03	Busy traffic on road and highway, birds chirping, wind in trees/grass, insects
	MP04	Traffic on US 41 is dominant, visible steam of smaller vents at plant, but not audible, train passing at 7:30
	MP05	Traffic on US 41 is dominant, occasional bird chirp, light traffic in neighborhood and on Wrightstown Rd., plane overhead at 14:30
	MP06	Traffic on US 41 is dominant, occasional bird, plane overhead at 10:50
	MP07	Busy traffic on road and highway dominant, train passing, birds chirping
6 P.M. to 8 P.M.	MP01	Pump noise at plant, noise from maintenance shop, birds chirping, wind in grass/trees, busy traffic on road & highway, people talking, Bobcat operating
	MP02	Pump noise at plant, busy traffic on road & highway, birds chirping, large trucks (x7), truck backing up at plant, cows
	MP03	Busy traffic from road and highway dominant, birds chirping, wind in trees/grass, truck backing up at plant
	MP04	Traffic on US 41 is dominant, plane (not visible), tractor with brushhog at site is periodically audible
	MP05	Traffic on US 41 is dominant, minimal local traffic, occasional bird, hammering in distance (quiet)
	MP06	Traffic on US 41 is dominant, occasional bird
	MP07	Busy traffic on road and highway dominant, birds chirping, large trucks (x3)

Table 2: Extraneous Noises during Non-Operational Measurements (cont.)

10 P.M. to 12 A.M.	MP01	Traffic constant, wind in trees, pump noise, HRSG building HVAC, animal in grass, men working in distance
	MP02	Close traffic dominant, plant pumps, when no traffic, highway traffic constant, motorcycle
	MP03	Traffic constant, birds, wind in trees
	MP04	Traffic on US 41 is dominant, occasional bird
	MP05	Traffic on US 41 is dominant, occasional bird, paused while car went by on fresh road surface, paused for person & dog, paused for vehicle
	MP06	Traffic on US 41 is dominant, occasional bird, plane overhead at 3:20 pm
	MP07	Traffic constant/dominant, wind in trees, birds, large trucks, close by traffic (x4), people talking in distance

Table 3: Existing Non-Operational Ambient Noise Levels

Time Period	Measurement Point Locations	Sound Level Statistics A-weighted Sound Level (dBA)				Sound Level Statistics C-weighted Sound Level (dBC)			
		Lave	L10	L50	L90	Lave	L10	L50	L90
6 A.M. to 8 A.M.	MP01	55	58	54	52	64	65	61	58
	MP02	70	74	65	58	72	76	66	61
	MP03	54	56	54	52	62	63	60	57
	MP04	59	61	58	57	72	76	65	62
	MP05	58	60	58	56	64	66	62	60
	MP06	58	60	58	56	64	66	62	60
	MP07	65	70	61	58	77	81	65	62
12 P.M. to 2 P.M.	MP01	54	56	52	51	63	64	59	57
	MP02	68	72	54	48	73	74	60	56
	MP03	52	55	51	49	64	64	58	55
	MP04	53	55	53	51	62	63	60	58
	MP05	55	59	54	48	63	65	61	57
	MP06	59	61	58	55	66	68	64	61
	MP07	59	61	58	57	65	66	63	60
6 P.M. to 8 P.M.	MP01	53	55	52	50	61	62	58	56
	MP02	66	70	55	50	70	72	59	56
	MP03	53	56	52	49	61	62	56	53
	MP04	51	53	51	49	60	62	57	55
	MP05	56	58	56	53	62	64	60	56
	MP06	58	61	58	55	65	67	62	59
	MP07	58	60	58	55	64	65	61	58

Table 3: Existing Non-Operational Ambient Noise Levels (cont.)

10 P.M. to 12 A.M.	MP01	51	54	51	50	59	61	58	56
	MP02	57	55	47	46	60	59	55	53
	MP03	46	50	47	46	55	57	52	50
	MP04	48	51	48	46	55	57	54	51
	MP05	49	53	49	45	56	58	53	49
	MP06	51	54	50	45	60	62	57	52
	MP07	49	52	49	46	54	56	52	49

Table 4: Non-Operational Ambient Un-weighted Octave Band Data

Time Period	Measurement Point	Frequency (Hz)									
		16.0	31.5	63.0	125	250	500	1,000	2,000	4,000	8,000
6 A.M. to 8 P.M.	MP01	60.5	59.4	60.1	56.2	49.1	50.9	51.6	47.9	44.1	43.6
	MP02	61.4	62.4	64.7	64.6	60.5	62.7	67.3	63.8	54.9	46.2
	MP03	59.7	58.6	57.4	54.0	40.9	47.6	52.0	45.6	41.5	41.7
	MP04	67.9	70.6	70.5	53.7	48.3	55.3	56.6	47.9	38.2	38.9
	MP05	59.3	60.2	59.4	53.0	45.7	50.5	56.7	50.8	38.9	38.8
	MP06	59.3	60.2	59.4	53.0	45.7	50.5	56.7	50.8	38.9	38.8
	MP07	71.9	74.9	74.6	65.1	58.4	61.7	62.0	56.2	47.2	41.9
12 P.M. to 2 P.M.	MP01	61.1	58.2	59.4	55.8	52.3	50.0	48.9	46.5	43.6	41.0
	MP02	64.8	63.4	66.8	67.5	62.8	64.1	65.0	60.9	52.5	48.7
	MP03	59.8	59.2	62.5	55.5	41.3	46.1	49.0	43.6	42.8	42.9
	MP04	61.3	60.5	57.0	45.7	43.0	49.4	50.7	43.9	40.0	39.5
	MP05	61.8	62.2	58.2	50.9	44.4	49.7	53.4	46.8	38.6	39.0
	MP06	64.6	63.1	61.8	57.5	44.9	50.0	56.4	52.4	40.9	39.4
	MP07	63.2	61.5	59.4	56.0	48.9	54.4	57.1	48.6	41.4	41.3
6 P.M. to 8 P.M.	MP01	58.6	56.0	55.7	56.4	49.1	48.9	48.7	46.0	42.6	41.1
	MP02	58.7	61.1	63.9	64.1	62.3	58.4	62.4	59.8	50.4	43.7
	MP03	56.2	55.7	57.3	53.7	42.2	47.2	50.5	44.5	39.0	40.7
	MP04	59.0	57.9	56.3	43.3	40.0	46.3	49.2	40.4	38.3	39.4
	MP05	59.5	59.5	58.2	47.8	42.0	50.4	54.7	46.1	37.5	39.0
	MP06	60.5	60.3	61.6	55.6	43.7	49.8	56.4	51.1	39.5	39.0
	MP07	59.5	59.1	58.3	56.9	48.2	52.5	56.5	49.1	40.3	41.0
10 P.M. to 12 A.M.	MP01	57.8	54.9	54.1	52.2	48.9	46.3	46.6	45.4	42.4	41.0
	MP02	55.3	54.8	53.9	49.3	46.7	49.7	54.3	50.1	42.1	41.1
	MP03	56.1	53.6	49.8	41.8	37.9	43.3	43.7	38.9	38.1	40.9
	MP04	53.3	52.9	50.4	40.1	38.1	44.7	45.8	38.4	36.4	38.9
	MP05	53.4	53.3	51.3	42.4	36.8	43.5	47.9	41.3	35.9	38.7
	MP06	58.0	57.4	56.6	48.7	36.0	44.0	48.6	43.9	37.2	38.8
	MP07	51.7	49.9	48.4	42.3	38.8	44.8	47.0	40.4	37.1	40.6

**APPENDIX C - MANUFACTURER'S PROVIDED SOUND DATA AND
EQUIPMENT SOUND POWER LEVELS**

GE Power & Water

Fox 3/7F5, A651
Project Name / Frame Size

Preliminary
GE IPS #

Estimate of Sound Power Levels at Base Load, dB (Ref. 1 picowatt).

Please note the sound power levels are being provided only for use in modeling the noise of the plant.

They are not guaranteed. The values are per unit.

	OCTAVE BAND CENTER FREQUENCIES (HZ)									A-wt
	31.5	63	125	250	500	1000	2000	4000	8000	
<u>INLET SYSTEM WITH 8 ft SILENCER</u>										
Inlet Filter Face (8 ft Silencer)	112	115	115	99	93	94	97	90	78	103
<u>GAS TURBINE PACKAGE</u>										
Accessory	104	107	101	98	97	97	99	93	87	103
Inlet Plenum	89	92	89	91	90	91	100	90	79	102
Turbine Compartment	111	113	107	106	103	101	106	102	97	110
Exhaust Diffuser (Note 1)	113	112	106	100	95	88	86	82	77	98
Load Compartment	106	108	108	103	98	96	99	96	89	105
Generator	105	105	104	101	103	102	101	96	87	107
<u>GAS TURBINE EXHAUST DISCHARGE</u>										
Exhaust at Expansion Joint (Note 2)	134	145	149	148	144	142	135	118	101	146
<u>STEAM TURBINE PACKAGE</u>										
A14 Steam Turbine	116	113	103	102	101	96	93	90	89	102
Generator	105	105	104	101	103	102	101	96	87	107

NOTES

- 1 - These sound power levels include the effects of acoustical barrier walls.
- 2 - These sound power levels are inside the exhaust diffuser at the discharge flange.

Document Revision Table			
<i>Revision Description</i>	<i>Revision Level</i>	<i>Revision Date</i>	<i>Approved</i>
Initial Issue	-	1-Aug-2014	R. Loud

The values provided are estimates and not guaranteed. They are provided for use in determining the overall noise of the plant.

Table 1
Generic Project
SGT6-5000F(5ee) Equipment Only Gas Turbines
March 1, 2013

Source Number	Description	Estimated Sound Power Levels For Major Noise Sources, dB re 1 picowatt									
		Octave Band Center Frequency in Hz									
		31.5	63	125	250	500	1K	2K	4K	8K	A-Weighted
1	GT Exhaust Diffuser & Expansion Joint - Each	133	124	112	111	106	102	100	98	81	110
2	GT Inlet Duct Wall Radiated - Lagged - Each	107	106	106	95	86	93	82	85	89	97
3a	GT Inlet Filter House - Overhead Inlet with Static Two-stage Non-coastal Filter + Base Design Inlet Silencer	119	115	110	98	82	88	82	89	99	101
3b	GT Inlet Filter House - Overhead Inlet with Pulse Self-cleaning Non-coastal Filter + Base Design Inlet Silencer	120	114	111	100	77	88	76	90	97	100
3c	GT Inlet Filter House - Overhead Inlet with Static Two-stage Non-coastal Filter and Evaporative Cooler + Base Design Inlet Silencer	120	115	111	103	83	86	80	92	95	101
3d	GT Inlet Filter House - Overhead Inlet with Pulse Self-cleaning Non-coastal Filter and Evaporative Cooler + Base Design Inlet Silencer	120	113	109	99	76	86	74	87	91	98
3e	GT Inlet Filter House - Overhead Inlet with Static Two-stage Coastal Filter + Base Design Inlet Silencer	120	116	113	104	84	88	82	95	101	104
3f	GT Inlet Filter House - Overhead Inlet with Pulse Self-cleaning Coastal Filter + Base Design Inlet Silencer	120	116	113	104	86	92	88	100	102	105
3g	GT Inlet Filter House - Overhead Inlet with Static Two-stage Coastal Filter and Evaporative Cooler + Base Design Inlet Silencer	120	115	111	105	85	92	81	92	95	102
3h	GT Inlet Filter House - Overhead Inlet with Pulse Self-cleaning Coastal Filter and Evaporative Cooler + Base Design Inlet Silencer	120	115	111	103	85	90	86	97	96	102
3i	GT Inlet Filter House - Overhead Inlet with Static Two-stage Non-coastal Filter + Option Design Inlet Silencer	118	113	107	91	82	88	82	84	96	98
3j	GT Inlet Filter House - Overhead Inlet with Pulse Self-cleaning Non-coastal Filter + Option Design Inlet Silencer	118	111	105	87	75	88	76	79	92	95
3k	GT Inlet Filter House - Overhead Inlet with Static Two-stage Non-coastal Filter and Evaporative Cooler + Option Design Inlet Silencer	118	112	105	90	81	86	80	81	90	95
3l	GT Inlet Filter House - Overhead Inlet with Pulse Self-cleaning Non-coastal Filter and Evaporative Cooler + Option Design Inlet Silencer	119	111	105	91	74	86	74	79	88	94
3m	GT Inlet Filter House - Overhead Inlet with Static Two-stage Coastal Filter + Option Design Inlet Silencer	118	113	107	93	84	94	83	84	96	99
3n	GT Inlet Filter House - Overhead Inlet with Pulse Self-cleaning Coastal Filter + Option Design Inlet Silencer	118	113	107	91	84	92	88	89	97	100
3o	GT Inlet Filter House - Overhead Inlet with Static Two-stage Coastal Filter and Evaporative Cooler + Option Design Inlet Silencer	118	112	105	92	83	92	81	81	90	96
3p	GT Inlet Filter House - Overhead Inlet with Pulse Self-cleaning Coastal Filter and Evaporative Cooler + Option Design Inlet Silencer	119	113	107	95	83	90	86	89	93	98
4	GT Fuel Gas Systems - Each	104	100	89	81	80	86	88	91	89	96
5	GT Generator, TEWAC - Each	110	115	110	93	82	77	78	75	72	96
6	Unenclosed Lube Oil Package - Each GT	99	102	100	100	100	100	101	98	91	106
7	GT Enclosure Walls/Roof Radiated - Each	94	99	91	87	82	86	90	84	75	94
8	GT Enclosure Air Inlet Vents - Total Each GT	89	95	84	80	73	71	76	77	83	85
9	GT Enclosure Air Discharge Vents - Total Each GT	91	96	88	84	75	74	74	73	78	83
10	Rotor Air Cooler - 1 X 100% Fin Fan - Each	107	105	100	96	94	89	85	83	79	96

Please be advised that the above estimated Sound Power Levels are qualified as follows:

- This transmittal contains information submitted in confidence and is to be used for the acoustical modeling purpose for which it is intended. This information may not be reproduced in whole or in part without the written authorization of Siemens Energy, Inc., but may be submitted to the customer's consultants for acoustical modeling provided that such parties agree in writing to protect the Sound Power Level information and to keep it confidential.
- The Sound Power Levels given do NOT incorporate any acoustical design margins, measurement uncertainties, barrier effects including reflectivity, or directivity factors and as such are representative of analytical modeling inputs utilized to predict estimated sound levels at far field positions with NO margins. The application of reasonable and customary design margins consistent with industry practice and experience must be applied to these, or any other estimated sound power levels, when used as the basis for acoustical modeling of a facility.
- The Sound Power Levels given are estimated only and accordingly, Siemens Energy, Inc. has no warranties or representations in its use. The recipient may utilize this information strictly at its own risk.
- The Sound Power Levels are applicable to base load operation with ULN combustors on natural gas fuel that complies with the latest revisions to the Siemens Fuel Specifications and are exclusive of transients, start-up and shutdown and any other off normal and/or emergency conditions which will result in increased sound power levels for some sound sources.
- Siemens Energy, Inc. reserves the right to modify any of the design particulars of any component within the Siemens Energy, Inc. scope of supply. Such modifications may affect the individual Sound Power Levels given, however, the average far field sound level design basis would be unchanged.
- The Sound Power Levels are given on a per unit basis, where applicable, and as such any analytical acoustical model must consider the additive effects of the sound level contributions from multiple component sound sources.
- The Sound Power Levels given are applicable only to equipment within the Siemens Energy, Inc. scope of supply. Sound sources associated with the Facility that are not within the Siemens Energy, Inc. scope of supply must be considered in any analytical acoustical model of the overall facility.
- The GT inlet filter PWLs given are intended to represent the ESTIMATED overall sound emissions from a SGT6-5000F gas turbine overhead inlet filter house equipped with various specified inlet filters with and without evaporative cooler, Base and Option acoustical design inlet duct silencer, and with no other acoustical upgrades applied.

**Table 2
Generic Project
Estimated SGT6-5000F(5ee) Exhaust Sound Power Levels
March 1, 2013**

Description	Sound Power Level, dB re 1 picowatt									dB(A)
	Octave Band Center Frequency, Hz									
	31.5	63	125	250	500	1000	2000	4000	8000	
Gas Turbine Exhaust Sound Power Levels (* Subject to below qualifying caveats)	145	144	145	145	146	146	143	145	130	151

* Please be advised that the above Sound Power Levels are qualified as follows:

1. The PWLs are given on a "per unit" basis and as such any analytical acoustical model must consider the additive effects of the contributions from any other gas turbines and their associated components.
2. This Sound Power Level transmittal is proprietary to Siemens. It is submitted in confidence and is to be used solely for the purpose for which it is intended. This information may not be reproduced in whole or in part without the written authorization of Siemens.
3. The Estimated Exhaust Sound Power Levels are at the exhaust flange of the gas turbine.
4. The Sound Power Levels are applicable to gas turbine operation with Ultra Low NOx (ULN) combustors on natural gas fuel that complies with the latest revision to the Siemens Gas Fuel Specification.
5. The Sound Power Levels given are for steady state base load conditions and do not include transients, startup, shutdown, and other off normal, or emergency conditions.
6. The Sound Power Levels given are estimated only and accordingly, Siemens has no warranties or representations in its use. The recipient may utilize this information strictly at its own risk.
7. The Sound Power Level data provided is not intended to be used to revise, alter, modify, or in any way add to the A-weighted sound level guarantee that has previously been offered.
8. These Sound Power Levels do NOT incorporate any acoustical design margins or measurement uncertainties and as such are representative of analytical modeling inputs utilized to predict estimated sound levels at far field positions with NO margins. Appropriate margins consistent with industry practice should be prudently applied in any acoustical modeling utilizing these Sound Power Levels.
9. Siemens reserves the right to modify any of the estimated sound power levels of any component within the Siemens scope of supply, consistent with contractual guarantees, due to updated vendor design information, results from further field testing, revised measurement techniques, and/or revised equipment. Such modifications may affect the sound power levels given above, even though the near field A-weighted average sound level would be unchanged.

Project:	WPS Fox III	Cells:	6	Fans / Cell:	1
Client:	Black & Veatch	Length:	54 ft	Fan Model:	APT-32.8K-13
Proposal #:	14-3988	Width:	45 ft	Fan Dia:	32.81 ft
Selection #:	03 (Inline 7-28-14)(BEC)	Ground TOC:	1 ft	Fan Tip Speed:	12454.7 ft/min
Rated By:	BEC	Air Inlet H:	11 ft	Fan RPM:	120.8305
Date:	07/22/2014	Rain H:	12.5 ft	Fan Airflow:	1,458,109 CFM
Cell Arrange:	Inline	Fan Deck H:	31 ft	Fan Static:	0.645 inWG
Air Inlet Conf:	North South East West	Fan Stack H:	10 ft	Motor Speed:	RPM1750
Water Atten:	False	L / G:	1.4753	Motor Power (AMS):	249.1 HP
Ground Type:	Gravel	Water Load:	6.58 GPM/ft2	Motor Power (Nom):	250 HP
Measuring H:	5 ft			Gear Model:	1712.5
				Gear Ratio:	15

COMPONENT SOUND POWER LEVELS, REF: 1.0 E-12 WATT

Water, Per Cell		31.5	63	125	250	500	1,000	2,000	4,000	8,000	16,000
PWL, Corrected, Total	106.6 dB(L)	78.6	78.6	78.6	87.6	96.6	99.6	99.6	99.6	99.6	96.6
PWL, Corrected, Total	106.3 dB(A)	39.2	52.4	62.5	79	93.4	99.6	100.8	100.6	98.5	90

Fan, Per Cell		31.5	63	125	250	500	1,000	2,000	4,000	8,000	16,000
PWL, UserInput, Total	115.8 dB(L)	106.9	111.3	109.8	107.3	103.2	102.4	96.7	92.2	85.8	85.8
PWL, Corrected, Total	116.1 dB(L)	107.3	111.7	110.2	107.7	103.6	102.8	97.1	92.6	86.2	86.2
PWL, Corrected, Total	107 dB(A)	67.9	85.5	94.1	99.1	100.4	102.8	98.3	93.6	85.1	79.6

GearBox, Per Cell		31.5	63	125	250	500	1,000	2,000	4,000	8,000	16,000
PWL, Corrected, Total	98.5 dB(L)	85	85	92	94	92	88	82	73	62	62
PWL, Corrected, Total	93 dB(A)	45.6	58.8	75.9	85.4	88.8	88	83.2	74	60.9	55.4

Motor, Per Cell		31.5	63	125	250	500	1,000	2,000	4,000	8,000	16,000
PWL, Corrected, Total	91.4 dB(L)	78.1	80.1	83.1	84.1	85.1	83.1	82.1	75.1	68.1	68.1
PWL, Corrected, Total	88.2 dB(A)	38.7	53.9	67	75.5	81.9	83.1	83.3	76.1	67	61.5

EMISSION POINT SOUND POWER LEVELS, REF: 1.0 E-12 WATT

All, Total		31.5	63	125	250	500	1,000	2,000	4,000	8,000	16,000
PWL, All, Total	124.5 dB(L)	115.1	119.5	118	115.7	112.4	112.4	109.4	108.2	107.6	104.7
	117.6 dB(A)	75.7	93.3	101.9	107.1	109.2	112.4	110.6	109.2	106.5	98.1

SOUND PRESSURE LEVELS, REF: 2.0 E-5 Pa

FaceSouth All, Total Distance: 13 ft		31.5	63	125	250	500	1,000	2,000	4,000	8,000	16,000
Attn., Total, Total	dB(L)	35.4	35.4	35.4	35.3	34.8	34.2	33.3	32.9	33.1	34.1
SPL, All, Total	89.4 dB(L)	79.7	84.1	82.7	80.3	77.7	78.2	76.1	75.2	74.4	70.6
	83.7 dB(A)	40.3	57.9	66.6	71.7	74.5	78.2	77.3	76.2	73.3	64

Notes:

Motors Located South

Showing Analysis: FaceSouth

Showing Distance: 13 ft

Showing Results: Total

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 Phone: 913-322-5165
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EvapTech Asia Pacific Sdn Bhd
 MALAYSIA
 Phone: 011.603.8070.7255



CadnaA Model Sound Power Levels

Common Sources	31.5	63	125	250	500	1000	2000	4000	8000	A	lin
Boiler Feed Pump	98	103	105	96	101	100	99	94	90	105	110
Cooling Fan	115	120	118	116	112	112	109	108	108	118	124
Fin Fan Cooler	87	113	112	109	104	102	96	90	84	107	117
Gas Compressor		108	116	117	119	125	121	119	108	128	129
Gas Compressor		108	116	117	119	125	121	119	108	128	129
Gas Compressor Enclosure		104	112	113	115	121	117	115	104	124	125
GT Enclosure Discharge Vents / GT	91	96	88	84	75	74	74	73	78	83	98
GT Enclosure Inlet Vents / GT	89	95	84	80	73	71	76	77	83	85	97
Turbine Lube Oil Skid	99	102	100	100	100	100	101	98	91	106	109
GT Transformer	106	106	110	110	110	94	89	82	77	108	116
Misc Pump	93	92	94	94	94	94	94	91	84	100	103
SCR Ammonia Skid	104	103	95	97	100	102	98	93	91	105	110

GE Configuration Sources








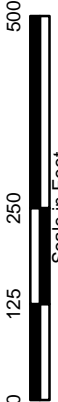

Combustion Exhaust Expansion Joint	113	112	106	100	95	88	86	82	77	98	116
Gas Turbine Enclosure	111	113	107	106	103	101	106	102	97	110	117
GT Inlet Ducting (filter house included)	100	99	93	91	80	73	80	53	27	87	103
GT Inlet Filter Face (with 8' silencer)	112	115	115	99	93	94	97	90	78	103	119
HRSG Body	102	110	111	106	95	91	84	64	41	101	115
GE HRSG Stack	99	109	107	99	84	78	63	42	20	94	112
HRSG Inlet Duct	109	117	118	113	103	100	93	73	47	108	122
HRSG Stack (no directivity)	114	125	128	123	114	101	84	67	50	118	131
GE Inlet Plenum	89	92	89	91	90	91	100	90	79	102	103
Load and Generator Enclosures	109	110	109	105	104	103	103	99	91	109	116
Steam Turbine	116	113	103	102	101	96	93	90	89	103	118
Stack Exit Without Directivity	128	118	124	119	124	111	87	71	53	122	131
Steam Turbine Generator	105	105	104	101	103	102	101	96	87	107	112

GE Configuration Sources










Seimens Fin Fan	120	118	113	109	107	102	98	96	92	109	123
Generator Enclosure and TEWAC	110	115	110	93	82	77	78	75	72	96	117
Gas Turbine Enclosure	101	106	98	94	89	93	97	91	82	101	109
GT Inlet Filter Face (Opt 3a)	119	115	110	98	82	88	82	89	99	101	121
HRSG Body	113	109	107	103	97	95	92	91	67	101	116
SEI HRSG Stack	110	108	103	96	86	82	71	70	47	92	113
HRSG Inlet Duct	120	116	114	110	105	104	101	100	76	110	123
HRSG Stack (no directivity)	125	124	124	120	116	105	92	95	79	116	130
SEI Inlet Plenum	107	106	106	95	86	93	82	85	89	97	111
ST Bldg	97	94	89	87	88	87	86	83	76	92	100
Steam Turbine Lube Oil Skid		110	102	105	102	101	98	98	94	106	113

APPENDIX D - MODELING LAYOUT



<p>  Measurement Points  Fox Energy Center Approximate Property Line  Opt 1 Area Source </p>	<p>  Opt 1 Buildings  Opt 1 Pt Source  Opt 1 V Area Source </p>	<p>  NORTH  Scale in Feet 0 125 250 500 </p>
		<p>Figure D-1 Site Option 1 Model Layout</p>



<ul style="list-style-type: none">  Measurement Points  Fox Energy Center Approximate Property Line  Area Sources Opt 2 	<ul style="list-style-type: none">  Bld Opt 2  V Area Sources Opt 2  Pt Sources Opt 2 	  <p>Scale in Feet</p>		<p style="text-align: center;">Figure D-2 Site Option 2 Model Layout</p>
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APPENDIX E - EXPECTED NOISE CONTOURS

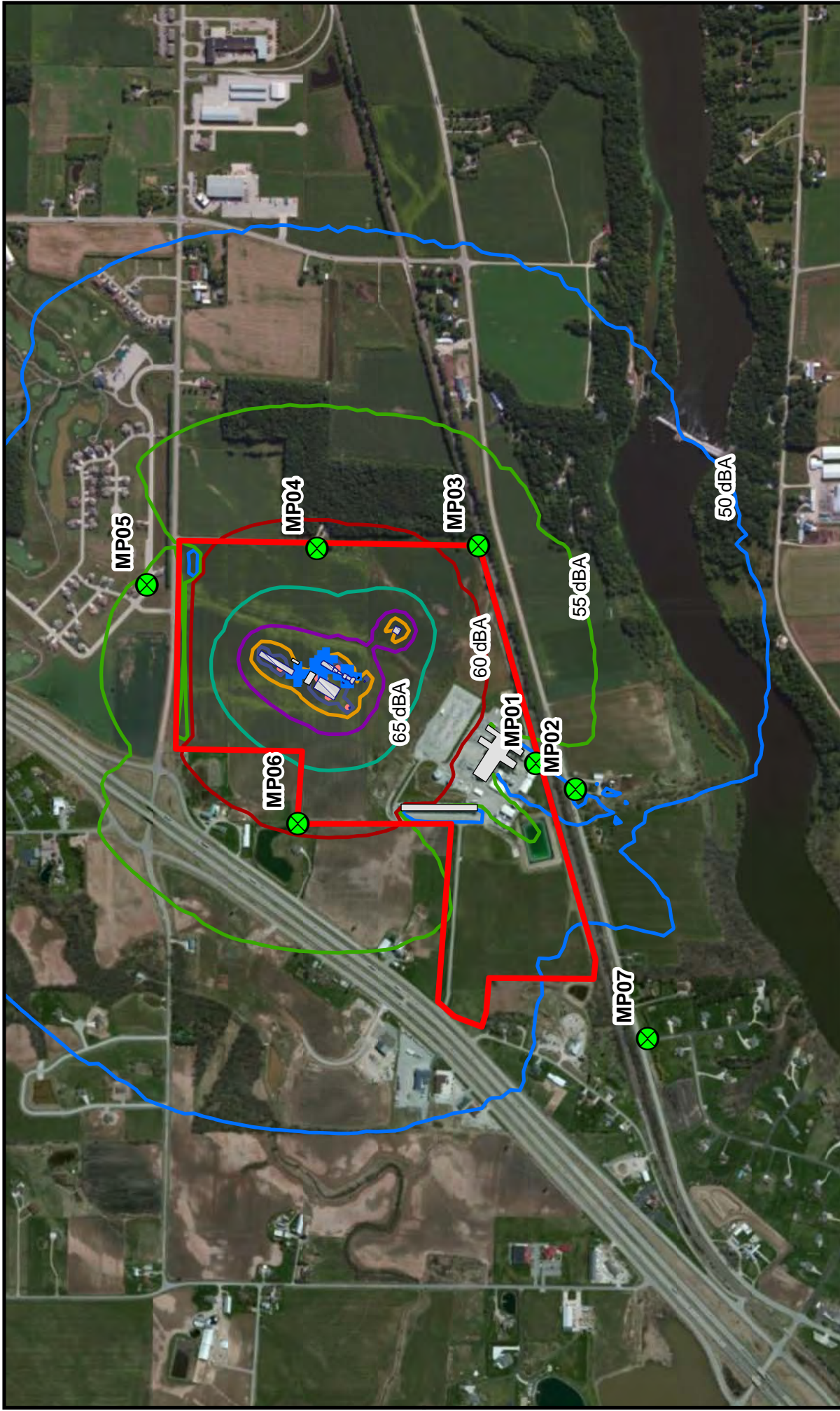



Figure E-1
 Unmitigated - Fox 3
 Site Option 1 - GE Turbine
 Noise Contour



Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line


dBA

- 60
- 65
- 70
- 75
- 80
- 85

Scale

0 575 1,150 2,300


Scale in Feet



NORTH



Figure E-2
 Unmitigated - Fox 3
 Site Option 1 - Siemens Turbine
 Noise Contour



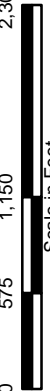
Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line


dBA

- 60
- 55
- 50
- 75
- 80
- 85

Scale in Feet



0 575 1,150 2,300



NORTH



Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line

dBA

- 60
- 65
- 70
- 75

NORTH

Scale in Feet

Burns & McDonnell
SINCE 1898

Figure E-3
 Unmitigated - Total
 Site Option 1 - GE Turbine
 Noise Contours



Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line

dBA

- 50
- 55
- 60
- 65
- 70
- 75

NORTH

Scale in Feet

0 575 1,150 2,300


Burns & McDonnell
SINCE 1898

Figure E-4
 Unmitigated - Total
 Site Option 1 - Siemens Turbine
 Noise Contours

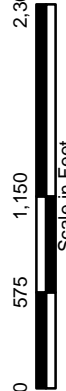


Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line
- dBA**
- 60
- 55
- 50
- 75
- 80
- 65
- 70
- 85




NORTH



Scale in Feet

0 575 1,150 2,300



Burns & McDonnell
SINCE 1898

Figure E-5
 Unmitigated - Fox 3
 Site Option 2 - GE Turbine
 Noise Contours



Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line

dBA

- 60
- 55
- 50
- 75
- 80
- 85

NORTH

Scale in Feet

Burns & McDonnell
SINCE 1898

Figure E-6
 Unmitigated - Fox 3
 Site Option 2 - Siemens Turbine
 Noise Contours



Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line
- dBA**
- 50
- 55
- 60
- 65
- 70
- 75
- 80
- 85

Scale in Feet

0 575 1,150 2,300

North Arrow

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SINCE 1898

Figure E-7
 Unmitigated - Total
 Site Option 2 - GE Turbine
 Noise Contours



Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line
- dBA**
- 60
- 65
- 70
- 75
- 80
- 85

Scale in Feet

0 575 1,150 2,300

North Arrow

Scale in Feet




Figure E-8
 Unmitigated - Total
 Site Option 2 - Siemens Turbine
 Noise Contours



Legend

- X Measurement Points
- Fox Energy Center Approximate Property Line

Scale

Scale in Feet

0 575 1,150 2,300


NORTH



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Figure E-9
 Mitigated - Total
 Site Option 1 - GE Turbine
 Noise Contours



Figure E-10
 Mitigated - Total
 Site Option 1 - Siemens Turbine
 Noise Contours



<p> Measurement Points</p> <p> Fox Energy Center Approximate Property Line</p>	<p>dBA</p> <p>60 — 75</p> <p>50 — 80</p> <p>55 — 85</p>
--	--



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APPENDIX P LOCAL NOISE ORDINANCES

TOWN OF KAUKAUNA

TOWNSHIP OF KAUKAUNA, OUTAGAMIE COUNTY
ZONING ORDINANCE

CERTIFIED BY DATCP - ?
FURTHER AMENDED BY TOWN BOARD - SEP. 30, 2013
FURTHER AMENDED BY TOWN BOARD - SEP. 16, 2013
AMENDED BY TOWN BOARD - JUL. 8, 2013
ADOPTED BY TOWN BOARD - DEC. 9, 1991

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9. Telecommunication Towers.

C. Height and Area

1. Height. Buildings hereafter erected or structurally altered shall exceed neither four stories nor fifty (50) feet in height.
2. Setback. Shall not be less than twenty-five (25) from all roads, alleys, and service roads except for U.S. Highway "41" and all class "A" Highways which shall require a setback of fifty-five (55) feet from the highway right-of-way line unless such highways are provided with service roads, in which case the set back shall be twenty-five (25) feet from the service road right-of-way line, otherwise as provided in Highway Setback Lines. Set backs for on premise signs shall not be less than five (5) feet from the road right of way and seventy five (75) feet from an intersection and no less than ten (10) feet from the ground in Commercial and Light Industrial District. Bill Board signs shall refer to the Bill Board Ordinance.
3. Rear Yard. There shall be a rear yard of not less than twenty-five (25) feet.
4. Side Yard. For buildings or parts of buildings hereafter erected or structurally altered for residential use, the side yard regulations of the Rural Development District shall apply. In all other cases a side yard of five feet is required unless adequate vehicle access to the rear yard is provided and is approved by the Town Board, in which case the Town Board may eliminate the side yard requirement.
5. Lot Area. For building or parts of buildings hereafter erected, moved or structurally altered for residential purposes, the lot area requirements of the Rural Development shall apply, otherwise there shall be no minimum lot area for this district.

3.9 Light Industrial District

- A. Permitted Uses. In the Light Industrial District no premises shall be used and no building shall be erected or structurally altered, unless otherwise provided in this chapter except for one or more of the following uses:

1. All uses permitted in the Commercial District.
2. Printing and Publishing.
3. Paper products manufacturing except for manufacture of paper.
4. Repair, service and assembly of vehicles.
5. Storage and warehousing, except the storage of old iron, bottles, rags or junk, or so called automobile wrecking garage or business of wrecking and parking automobile wrecks on the premises or in garages.
6. Bottling works and non-alcoholic beverage manufacture.
7. Food processing and packing.
8. Contractor's storage yards.
9. Fuel and material yards.
10. Wood products manufacture and repair.
11. Office, home appliance and sporting goods manufacture.
12. Wholesale business.
13. Leather goods manufacture.
14. Manufacture of products from woven goods.
15. Cleaning, dyeing, pressing and laundry establishments.
16. Laboratories.
17. Jewelry and cosmetic manufacture.
18. Telecommunication Towers.
19. Enameling and painting.
20. Sheet metal works and tinsmith.
21. Ice plant.
22. Warehousing.
23. Bakeries.
24. Any kind of processing or treatment which is clearly incidental to the conduct of a wholesale business conducted on the premises.
25. Power Plant.

- B. Automotive Salvage yards. No automotive salvage on the property.

- C. Height and Area. For buildings or parts of buildings hereafter erected, moved or structurally altered, the height and area requirements shall be the same as for the Commercial District.

D. Noise Ordinance. Loud Noises prohibited.

1. Purpose. Noise is a serious hazard to the public health, welfare, safety and quality of life. Continued exposure to noise above 85 decibels over time will cause hearing loss. In general, the louder the noise, the less time required before hearing loss will occur. According to OSHA standards, hearing loss begins to occur after eight (8) hours of exposure of sound at 85 decibels. In addition, noise pollution causes other health problems including increased heart rates, blood pressure, cholesterol, respiratory, digestive and mental health problems. It also negatively impacts real estate values, land use, wild life and farm animals. The citizens of the Town have a right to an environment free from excessive sound that may jeopardize their health, welfare, safety, and/or degrade their quality of life.
2. Maximum Permissible Sound Levels. No person shall exceed the maximum permissible sound levels:
 - a. Between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday. 85 decibels.
 - b. All other times, 70 decibels.
3. Sound levels measurements.
 - a. Sound levels shall be measured by a Sound Level Pressure Meter or a Decibel Meter.
 - b. Sound measurements shall be made at the nearest lot line of the premise from which a sound complaint is received.
 - c. The Meter shall be placed at a height of at least three feet above the ground and at least three feet away from walls, barriers, obstructions and all other sound reflexive surfaces.
4. Mitigation of Sound. Any person engaging in an industrial activity that produces more than 85 decibels must mitigate the sound. Methods of mitigation may include:
 - a. Design and fabrication of silencing devices for the sound producing equipment used.
 - b. Changing the design or operation of machines adding vibration control, soundproof enclosures, and/or use of sound absorbing materials.
 - c. Location of the sound producing machinery or operation as far away from the lot lines.

- d. Use of vegetative buffers such as shrubs, trees, berms to absorb sound.
 - e. Any other sound mitigation method approved by the Board of Appeals.
5. Exemption. This provision shall not be applicable to:
- a. Any Town vehicle while engaged in necessary public business.
 - b. Excavations or repairs of streets or other public construction by or on behalf of the Town, County or State.

3.10 Heavy Industrial District

- A. Permitted Uses. In the Heavy Industrial District a building or premises may be used for any use except the following:
1. Residential, educational and institutional uses.
 2. Uses which are hazardous and uses which are noxious by reason of the emission of smoke, dust, gas, odors, or noise, unless the location of such use has been approved by the Board of Adjustment after a Public hearing.
 3. Wrecking or storage yard, unless it shall be fenced in by a tight board fence or equal, at least eight (8) feet high and such fence shall comply with the setback regulations. The location shall be approved by the Plan Commission after a public hearing.
 4. Telecommunication Towers shall be permitted.
- B. Height and Area. Same as Commercial District.
1. Side and Rear Yards. Same as Commercial District.
 2. Setback. Same as Commercial District.
- C. Noise Ordinance. Loud Noises prohibited. Same as 3.9(D).

3.11 Resource Conservation Overlay

- A. Purpose. The Purpose of the overlay is to preserve, protect, enhance, and restore all significant woodlands, streams, lakes, wetlands, related scenic areas, sub marginal farm lands, and abandoned

VILLAGE OF WRIGHTSTOWN

Village of Wrightstown, WI
Monday, October 6, 2014

Chapter 139. PEACE AND GOOD ORDER

§ 139-6. Loud and unnecessary noise prohibited.

[Amended 8-17-2004 by Ord. No. 08172004]

- A. It shall be unlawful for any person to make, continue or cause to be made or continued any loud and unnecessary noise.
 - (1) Types of loud and unnecessary noises. The following acts are declared to be loud, disturbing and unnecessary noises in violation of this section, but this enumeration shall not be deemed to be exclusive:
 - (a) Horns, signaling devices. The sounding of any horn or signaling device on any automobile, motorcycle or other vehicle on any street or public place in the Village for longer than three seconds in any period of one minute or less, except as a danger warning; the creation of any unreasonable loud or harsh sound by means of any signaling device and the sounding of any plainly audible device for an unnecessary and unreasonable period of time; the use of any signaling device except one operated by hand or electricity; the use of any horn, whistle or other device operated by engine exhaust and the use of any signaling device when traffic is for any reason held up.
 - (b) Radios, phonographs, similar devices. The using, operating or permitting to be played, used or operated any radio receiving set; musical instrument, phonograph or other machine or device for the producing or reproducing of sound in a loud and unnecessary manner. The operation of any set, instrument, phonograph, machine or device between the hours of 10:00 p.m. and 7:00 a.m. in a manner as to be plainly audible at the property line of the building, structure or vehicle in which it is located shall be prima facie evidence of a violation of this section.
 - (c) Loudspeakers, amplifiers for advertising. The using, operating or permitting to be played, used or operated of any radio receiving set, musical instrument, phonograph, loudspeaker, sound amplifier or other machine or device for the producing or reproducing of sound which is cast upon the public streets for the purpose of commercial advertising or attracting attention of the public to any building or structure. Announcements over loudspeakers can only be made

by the announcer in person and without the aid of any mechanical device.

- (d) Exhausts. The discharge into the open air of the exhaust of any steam engine, stationary internal combustion engine or motor boat except through a muffler or other device which will effectively prevent loud or explosive noises therefrom.
- (e) Construction or repair of buildings. The erection (including excavation), demolition, alteration or repair of any building, as well as the operation of any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist, or any other similar equipment attended by loud or unusual noise, other than between the hours of 7:00 a.m. and 9:00 p.m. on weekdays; provided, however, the Chief of Police shall have the authority, upon determining that the loss of inconvenience which would result to any party in interest would be extraordinary and of such nature as to warrant special consideration, to grant a permit for a period necessary within which time such work and operation may take place within the hours of 10:00 p.m. and 7:00 a.m.
- (f) Schools, courts, churches. The creation of any excessive noise on any street adjacent to any school, institution of learning, church or court while in use, which unreasonably interferes with the normal operation of that institution, provided that conspicuous signs are displayed in those streets indicating a school or court.
- (g) The provisions of this section shall not apply to:
 - [1] Any vehicle of the Village while engaged in necessary public business.
 - [2] Excavations or repairs of streets or other public construction by or on behalf of the Village, county, or state at night when public welfare and convenience renders it impossible to perform such work during the day.
 - [3] The reasonable use of amplifiers or loudspeakers in the course of public addresses which are noncommercial in nature.
- (2) Stationary noise limits.
 - (a) Maximum permissible sound levels.
 - [1] Noise from a stationary source shall not exceed the following standards for maximum sound pressure levels measured at the property line:

Zone	Noise Rating -	
	Daytime	Noise Rating - Nighttime
Residential	75 db	65 db
Commercial	85 db	75 db
All other zones	75 db	75 db

- [2] Ambient noise is the all-encompassing noise associated with a given source, usually being a composite of sounds with many sources near and far, but excluding the noise source being measured. Ambient noise is a factor and the subject noise shall not exceed the ambient noise by 5 db in any octave band to be designated excessive.
- [3] Pure tones and impulsive noises are factors. Five noise rating numbers shall be taken from the table as listed in Subsection **A(2)(a)[1]**, if the subject noise consists primarily of a pure tone or if it is impulsive in character.
- (b) Construction noise. Construction equipment in any zone may be operated between the hours of 7:00 a.m. and 9:00 p.m., provided that said equipment does not exceed a maximum sound level of 80 db(a) measured at the property line of the location at which said equipment is in use.
- (c) Noise in residential districts. In residential zones, the person in violation of this section shall be ordered to reduce the sound pressure to acceptable levels immediately by the monitoring officer.
- (d) Operation of certain equipment. Lawnmowers, chainsaws, powered garden equipment, snowblowers, electric insect killing/repelling devices, and other nonconstruction maintenance equipment shall be operated only during the hours of 7:00 a.m. and 9:00 p.m. unless within the specified noise levels measured at the property line of the location at which said equipment is in use.
- (e) Exemptions. Operations of emergency equipment shall be exempt from this chapter. Snowblowers not operated on a commercial basis shall be exempt from this chapter when used to gain access to a Village street. Emergency equipment shall include ambulance, police, fire, snow removal, civil defense sirens, etc., necessary for the health, safety, and protection of the citizens of the Village.
- (f) Methods of measuring noise.
- [1] Noise levels shall be made with a sound level, or decibel, meter.
- [2] Noise measurement shall be made at the nearest lot line of the premises from which a noise complaint is received. The decibel meter shall be placed at a height of at least three feet above the ground and at least three feet away from walls, barriers, obstructions, and all other sound-reflective surfaces.
- (g) Appeals. The Village Board may grant an exemption to individuals proving evidence of substantial hardship. Evidence that reasonable technological attempts have been made to correct the problem shall be considered grounds

- for granting an exemption to this chapter for existing industries.
- (3) Permits for amplifying devices.
- (a) Permit required. The use of loudspeakers or amplifying devices on the streets or in the parks of the Village of Wrightstown is prohibited unless the party desiring to use such loudspeaker or amplifying device first obtains a permit from the Village of Wrightstown.
- (b) The Police Department shall have the authority to revoke such a permit when the belief that the loudspeaker or amplifying device is becoming a nuisance because of the volume, method in which it is being used or the location in which it is being operated.
- (c) The Village shall not grant a permit to use a loudspeaker or amplifying device before the hours of 9:00 a.m. or after 11:00 p.m. No permit shall be granted to anyone who, in the opinion of the Police Department, uses said loudspeaker or amplifying device in such a manner or for such a purpose as to constitute a nuisance.
- B. Operation of motor vehicles. No person shall operate a motor vehicle so as to cause the tires thereof to squeal, the horn to blow excessively or the motor to race excessively.

APPENDIX Q COOLING TOWER ANALYSIS

Cooling Tower Impact Analysis

for the

**Wisconsin Public Service
Fox Energy Center 3
Natural Gas Combined Cycle Plant
Village of Wrightstown, WI**

prepared for

Burns & McDonnell

prepared by

**TRC
Lyndhurst, New Jersey**

September, 2014
November, 2014 (Revised)

List of Acronyms

Acronym	Description
ACFM	Actual cubic feet per minute
ASOS	Automated Surface Observing System
BACT	Best Available Control Technology
EPRI	Electric Power Research Institute
°F	Degrees Fahrenheit
GPM	Gallons per minute
hrs/yr	Hours per year
IEEE	Institute of Electrical and Electronics Engineers, Inc.
Kg/sec	Kilograms per second
LAER	Lowest Achievable Emission Rate
mg/cm ² /month	Milligrams/centimeter squared/month
MMBtu/hr	Million Btu per hour
MULT	SACTI - Plume dispersion program
MW	Megawatts
NaCl	Sodium chloride (common table salt)
ppm	Parts per million
PREP	SACTI – Meteorological processor program
SACTI	Seasonal/Annual Cooling Tower Impacts model
SURFER	Mapping and Graphics Software created by Golden Software
TABLES	SACTI – Table output program
TDS	Total dissolved solids
TSS	Total suspended solids
WPS	Wisconsin Public Service

INTRODUCTION

Wisconsin Public Service (WPS) headquartered in Green Bay, Wisconsin serves more than 440,000 electric customers in central and northeast Wisconsin and Michigan. WPS owns the original Fox Energy Center, which is located at N2310 East Frontage Road in the Village of Wrightstown in Outagamie County, Wisconsin, and is a natural gas/fuel oil fueled electric generating facility that provides electricity for WPS customers. Construction of the power plant began in November 2002 and it went into commercial operation in December 2005, when WPS began purchasing power from it. WPS agreed to purchase the Fox Energy Center in October 2012 and the transaction was closed on March 28, 2013.

The existing facility is a combined-cycle generating facility and is capable of producing 593-megawatts. The site is located on the north side of the Fox River, approximately half way between Kaukauna and Wrightstown, and between U.S. I-41 and State Highway 96. The existing Fox Energy Center consists of two General Electric 7FB advanced combustion turbines with heat recovery steam generators (Fox 1 and 2). The recovered heat energy as steam is used to generate additional electric energy in a steam turbine generator. The steam turbine condenser is cooled using circulating water in a 12-cell cooling tower located on the west side of the facility site.

The Fox Energy Center was chosen as the site for a new approximately 400 MW combined cycle electricity generating facility. This new facility, Fox 3 will be a combined cycle generating station comprising of one combustion gas turbine with heat recovery and a steam turbine generator using a cooling tower for condenser cooling. The cooling tower is anticipated to be six cells which is half of the size as the existing 12-cell cooling tower.

Burns & McDonnell is the Environmental Contractor for the Fox 3 facility and has requested TRC to prepare a cooling tower plume analysis using the Seasonal/Annual Cooling Tower Impacts (SACTI) model to assess the potential for ground fogging and icing on the adjacent roadways. Additional plume impacts including frequency and occurrence of elevated visible plumes and mineral deposition will also be assessed.

Figure 1 illustrates the location of the existing Fox 1 & 2 cooling tower and the two optional locations for Fox 3. The plume impacts from the existing and proposed cooling towers are examined both individually and collectively in this study. In-as-much-as the Fox 3 cooling tower will be located several hundred feet towards the northeast from the existing cooling tower with the possibility of overlapping plumes, TRC performed a cumulative cooling tower plume assessment, to determine the geographical extent and frequency of the plume impacts from the cooling towers, individually and collectively.

Figure 1: Fox 1 & 2 and Fox 3 – Cooling Tower Evaluation Locations



COOLING TOWER PLUME IMPACT ANALYSIS

The cooling tower plume impact analysis was performed using the Electric Power Research Institute (EPRI) Seasonal/Annual Cooling Tower Impacts (SACTI) model and assessed the potential impact of the proposed cooling tower plume-induced impacts on the surrounding area and specifically the nearby local roads. Specifically, the following impacts were assessed for average annual and seasonal frequencies for each cooling tower where the impacts are applicable:

1. Ground fog average hours of occurrence
2. Rime ice average hours of occurrence
3. Extent of average hours of elevated visible plumes
4. Mineral deposition with maximum deposition rates during the period of record

Summary tables of the eight-year seasonal and annual average plume frequency of occurrence and graphical presentations of the annual contours are provided in this report. Preliminary graphical results of the cooling tower options evaluated were provided to the Burns & McDonnell team for initial review and comment. TRC's has incorporated the comments on the plume analyses in this report. The SACTI model and cooling tower plume impacts analysis are described in the following sections.

SACTI MODEL DEFINITION, LIMITATIONS AND CONSERVATISM

The cooling tower plume analysis was performed using the SACTI model, developed by researchers for EPRI in the mid 1980's¹ specifically for modeling utility cooling towers. The model is widely recognized as being the most comprehensive and field-validated cooling tower plume model available for modeling power plant cooling tower plumes. A discussion of the structure of the SACTI model and the modeling methodology employed by this analysis is included in Appendix A this report.

The EPRI SACTI cooling tower model calculates the predicted seasonal and annual impacts of cooling tower vapor plumes. Various predicted environmental impacts simulated in the SACTI model include:

- Plume-induced fogging and icing (during freezing conditions) downwind of the cooling tower. A ground fog or icing condition occurs when the condensed vapor plume is lower than the tower outlet and impacts upon the ground.
- Frequencies of plume length, height and radius.
- Deposition of liquid water (drift), and minerals dissolved in the cooling tower plume drift (water droplets entrained in the plume during plume exhaust). Mineral deposition is primarily from the concentration of calcium and magnesium carbonates in the circulating water.

¹ Policastro, A.J., L. Coke, and M. Wastag (1984). User's Manual: -Cooling Tower Plume Prediction Code, Electric Power Research Institute, EPRI CS-3403-CCM, Palo Alto, CA

SACTI is considered by industry to be the model of choice for calculating potential environmental impacts from a wet evaporative cooling tower. The SACTI model calculates the predicted occurrence of the cooling tower condensed water plume fogging and rime icing events and hours of elevated plumes using actual (representative) meteorological data. While the model has been tested and validated using actual field conditions, it has certain limitations that cause it to provide conservative results. Namely, the model does not discern plume density, but rather if the plume water vapor content is either greater than or less than the ambient saturation deficit. In this way, SACTI tabulates only the presence of a potential condensed plume regardless if the plume is barely saturated and evaporating. The design for the facility is to employ a wet evaporative linear mechanical draft cooling tower to cool the circulating water from the steam turbine condenser.

In addition to the cooling tower operating parameters, the primary meteorological factors that influence cooling tower plume formation are wind speed and direction (which predominately drive the downwind location of the plumes and potential ground fogging due to downwash in the lee of the cooling tower); ambient temperature and humidity (which drive the shape, length of the plumes); and atmospheric stability (which affects the plume dispersion and subsequently the plume height, shape, length and radius). The potential for rime ice formation is strictly driven by ambient temperature, in which an occurrence of rime ice is also tabulated with the occurrence of a ground fog when the ambient temperature is below 32°F. Thus, hours of rime ice formation are also counted in the hours of ground fog. SACTI tabulates the conditions when rime ice may occur, but the actual formation of rime ice on an object is quite complicated and highly dependent on the ambient temperature, liquid water content of the cooling tower plume, and orientation of the object to name several variables. The primary factor driving mineral deposition is the concentration of dissolved minerals in the circulating water, the drift eliminator efficiency which limits the amount of liquid drift, and the drift droplet size spectrum. Typically, industrial and power generation cooling towers use high efficiency drift eliminators with 0.001% to 0.0005% of the circulating water rate as liquid drift and for air quality permitting of the cooling tower best available control technology (BACT) is considered 0.0005%.

Model Input Parameters

The model uses various site and cooling tower characteristics to estimate impacts. Table 1 lists the specific cooling tower dimensional parameters input into SACTI for each of the cooling towers assessed. The model used eight (8) years of hourly meteorological data recorded at the Appleton-Outagamie County Regional Airport (KATW) located approximately 17 miles west-southwest of the Fox Energy Center. Mixing height data was obtained using Holzworth AP-101² by season. The meteorological data for years 2006 through 2013 were chosen because that was the most recent data that was readily available and in a format that was usable by the meteorological preprocessor. As discussed later in this report, SACTI is a statistical model which tallies counts (i.e., hours for plume impacts or density per time for deposition) of the cooling tower impacts. As

² Holzworth, George C. (1972). Mixing Heights Throughout the Contiguous United States, U.S. EPA, Office of Air Programs Publication No. AP-101, January 1972.

such, a more reliable average is obtained when more meteorological data is used in the analysis. Figure 2 shows a wind rose that presents a graphical distribution of the average wind speeds and direction for the years of 2006-2013 meteorological data. These directions indicate the recorded prevailing directions from where the wind historically has blown. The nearest major roadways are U.S. I-41 to the northwest, Wrightstown Road to the north, and State Highway 96 to the south.

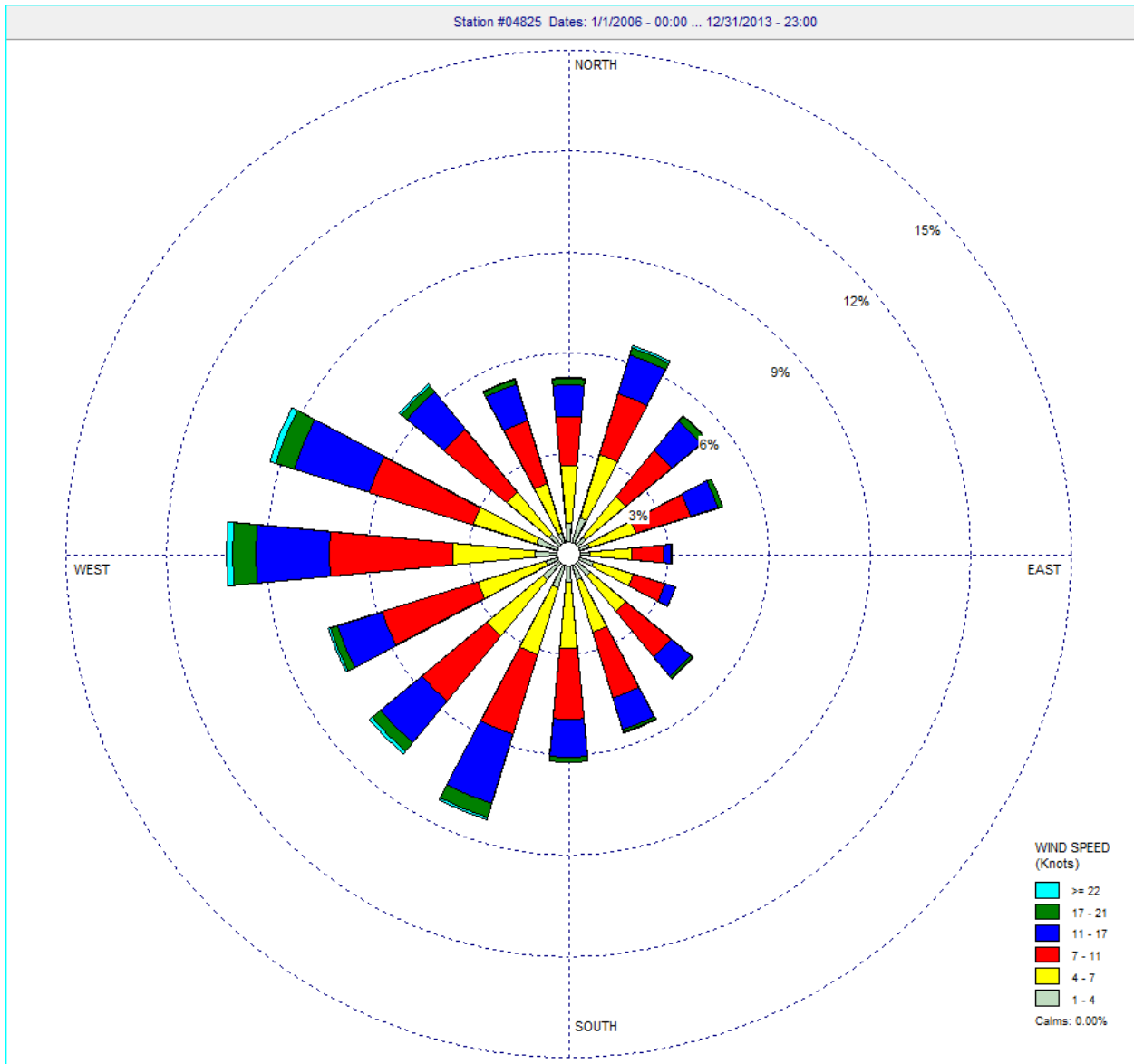
Methodology for Estimating Ground-Level Impacts

The SACTI model calculates the probable frequency of occurrence of ground-level plume fogging, rime icing, mineral deposition and shadowing (i.e. used to estimate hours of elevated visible plumes). In the case of ground fogging, rime icing and elevated visible plumes, the SACTI model provides results tabulated as total hours for the total block of data, which in this case is for eight years with seasonal and annual frequencies provided in the output summary tables.

The plume dispersion modeling program, known as MULT, assumes that ground fogging and rime icing potentially occurs during 10 pre-defined meteorological scenarios. For the purpose of this study, ground “fogging” has conservatively been defined to occur during the ten fogging scenarios for when the plume is modeled to be in physical contact with the ground and/or the plume is below the height of the cooling tower. The area covered by the plume is then defined to be the area of ground fogging. Likewise, ground-level rime icing is conservatively assumed to occur during the five plume fogging scenarios for which the air temperature is less than the freezing temperature of water (i.e., 32°F). Rime ice occurs when the supercooled water droplets impact and freeze on contact with structures within the fog plume. This is similar to icing that occurs on the wings of aircraft flying through supercooled clouds. Note that in addition to plume fogging and rime ice formation, additional plume impacts, such as mineral deposition and hours of visible plume were considered in this analysis.

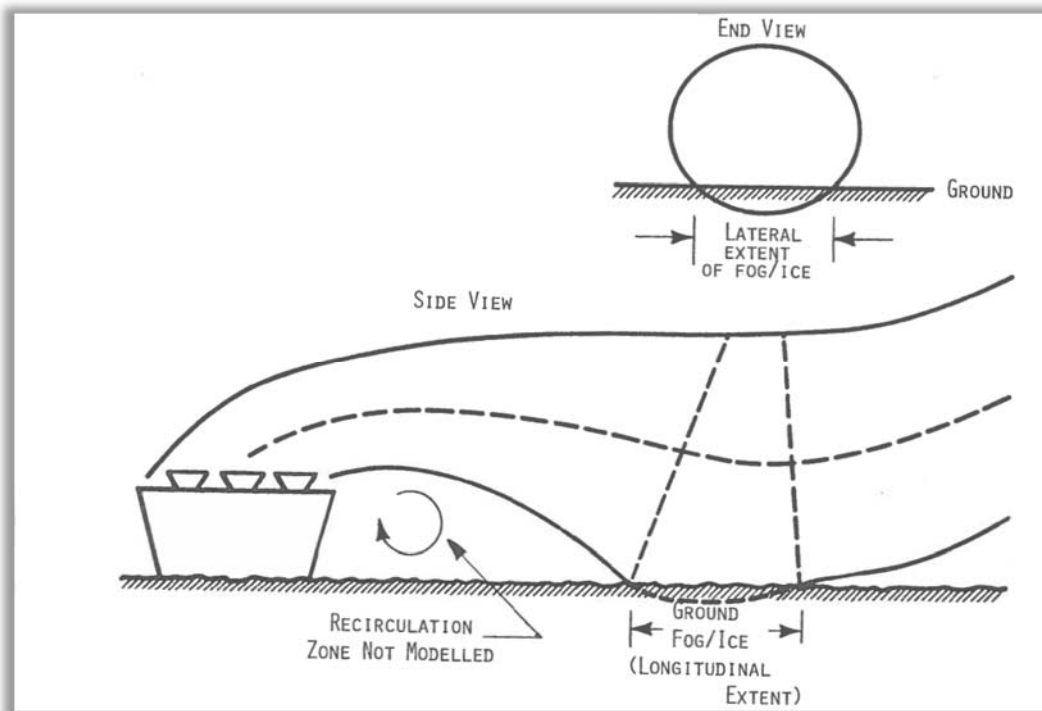
The following Figure 3 illustrates the cooling tower plumes from a typical wet mechanical draft cooling tower that result in fogging and icing. Note that plume abatement may minimize or eliminate ground fogging and icing from mechanical draft towers. Plume abatement was not considered in the plume analysis for the Fox Energy Facility cooling towers.

Figure 2: Wind Speed and Direction Frequency Distribution (Windrose) for Appleton-Outagamie County Regional Airport (KATW)⁽¹⁾



(1) Based on hourly observations from Appleton-Outagamie County Regional Airport Airport for years 2006-2013 with calm winds set to 1 knot with the last non-calm direction.

Figure 3: Relevant Geometry for Determining Fogging/Icing Area of Impact



Source: EPRI SACTI User's Manual: Cooling Tower Plume Prediction Code Figure 2-9, April 1984

A more detailed explanation of these conditions is provided in Appendix A to this report.

Plume Merging Methodology

The SACTI model does not have the ability to accurately assess or combine plumes from multiple cooling towers that are separated by a distance greater than the length of one of the cooling towers. The model output is based on fixed receptors in concentric circles around the origin (or center point) of a single tower. Plume merging from multiple towers is accomplished by using a graphical processing program, e.g., Surfer Graphics and interpolating the modeling results on a fixed common receptor grid. For this study, a fixed rectangular grid with receptors spaced at 25 meter intervals was used for combining the plume impacts. The interpolated receptors and results are output as ASCII text files and input into Excel as coordinates and values for each plume impact parameter of interest and for each cooling tower and location option. The combined impacts for plume fogging, icing and elevated visible plumes were determined by taking the maximum of either impact at each receptor location. In this fashion, the highest impacts from each tower are represented at each receptor location. Note that this method may slightly understate plume impacts at locations between the two cooling towers where impact counts from winds blowing in one direction might overlap those counts for a second tower when the winds are blowing towards the first tower. In such cases the total counts would be additive at such locations rather than the maximum of the two since the plumes would be occurring under different wind directions. However, any understating of the combined

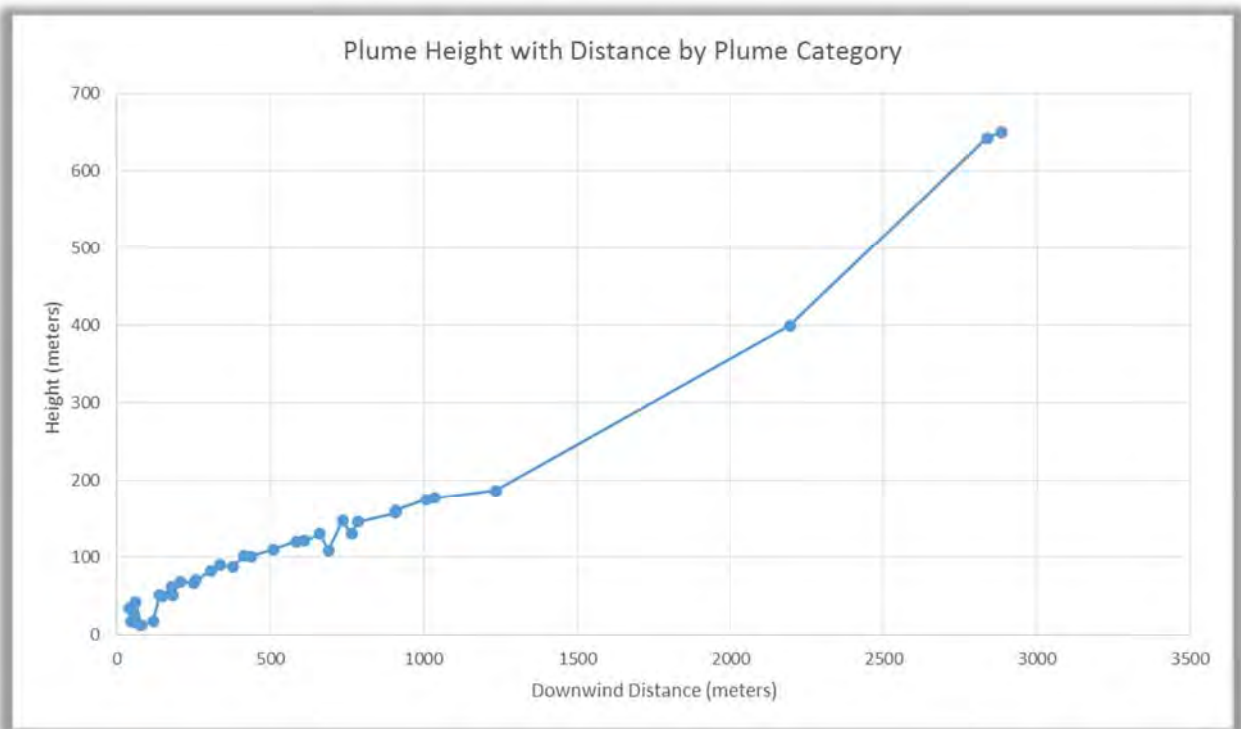
cooling tower plume impacts is expected to be minor and less than the maximum plume impacts from either cooling tower alone.

In the case of mineral deposition, since this is a cumulative effect, the maximum quarterly averaged mineral deposition for the existing cooling tower, along with the proposed Fox 3 cooling tower were added together to represent the combined deposition from both cooling towers. This was accomplished for both location options for the Fox 3 cooling tower.

COOLING TOWER MODELED IMPACTS

As stated previously, the cooling towers were evaluated using the SACTI model to determine the potential impact of plume fogging and rime ice formation, as well as mineral deposition and elevated visible plumes. The SACTI modeling results are tabulated and also presented in the attached figures. Table 2 provides a summary of the predicted impacts for the cooling towers. The following Figure 4 illustrates the relationship of plume height with downwind distance for the mechanical draft cooling tower examined for Fox 3 cooling tower.

Figure 4: Plume Height with Downwind Distance



Source: SACTI PREP and MULT output, TRC 2014

As illustrated in the figure, cooling tower elevated (i.e., above the ground) plume height can be expected to be generally less than 100 meters (300 feet) above the ground within about 500 meters (1,500 feet) of the tower, at which point the plumes tend to rise in height linearly with downwind distance. The several dips in plume height within about 200

meters of the cooling tower represent strong winds with low plume rise, but not conditions which may contribute to ground fog. Such ground fogging conditions are tabulated separately from the elevated plume calculations within SACTI.

Plume Statistics

SACTI processes the meteorological data and categorizes the meteorological conditions into 10 ground fogging categories or bins, and up to 35 bins for elevated plumes. Each of the bins has an associated plume length, height and radius associated, for each representative angle relative to the cooling tower. The specific plume statistics are obtained by extracting the plume characteristics and taking the maximum statistic for each of the various modeling angles provided in the SACTI Tables output. A table which summarizes the plume statistics based on all the plume categories assessed by SACTI for each of the cooling towers examined is included in Appendix B as Table B-9.

Summary of Plume Impacts

These cases examine the plume impacts for a standard wet mechanical draft cooling tower without plume abatement technology. The cases for Fox 3 are identical except for location and orientation of the cooling tower. Tables B-1 through B-8 in Appendix B provide the detailed output from the SACTI Tables module.

Plume Ground Fogging

Ground fog events were assessed for the mechanical draft cooling towers without plume abatement for the full year with the full heat duty. The location of the maximum annual average number of ground fogs (23 and 22 hours per year, for Fox 1&2 and 3, respectively) at any one location occurred immediately east and east-southeast of each cooling tower. The ground fogs are generally confined to the station property however, several hours of ground fogs are predicted to occur towards the west on Highway 41 and towards the east southeast on Route 96 for the existing Fox 1&2 cooling tower. The existing station operators would know if these potential ground fog occurrences are conservative estimates or if ground fogs from the existing cooling tower have actually impacted the nearby roadways. Ground fog plumes from Option 2 location for Fox 3 may potentially impact Route 96 to the southeast of the cooling tower with approximately 4 hours of ground fogs per year. The annual distribution of ground fogs is illustrated on Figures 5 through 9.

Plume Rime Icing

Rime ice may occur when the air temperature is below freezing, during a ground fog event. The existing cooling tower modeling results predicted a maximum of about 12 hours of potential rime ice formation on the station site, at a distance of about 100 meters (about 330 feet) towards the east. Rime ice distribution for the Fox 3 option 1 and 2 locations are similar to the Fox 1&2 distribution and Option 2 suggests that rime ice potential may occur for 2 hours per year on Route 96, towards the southeast of the cooling tower. As discussed earlier, the potential for rime ice does not indicate the occurrence of rime ice, but that a ground fog may occur with the ambient temperature below freezing. Figures 10 through 14 illustrate the distribution of potential for rime ice formation average hours per year.

Elevated Visible Plumes

The tables in Appendix B that indicate the frequency of elevated visible plumes are derived from the hours of plume shadowing output from SACTI. The assumption is that if a plume is sufficiently opaque to cast a shadow, it would be visible during the daylight hours. Figures 15 through 19 illustrate the frequency of elevated visible plumes from Fox 1&2 and Fox 3 Options 1 and 2. In general, most elevated plumes will occur within the immediate vicinity and above each of the cooling towers, with only a few extending beyond the station property boundary.

Mineral Deposition

The actual amount of mineral matter (total dissolved solids (TDS)/total suspended solids (TSS)) in the circulating water makeup varies, but is considered fairly low. The circulating water as modeled in SACTI used an estimated maximum TDS of about 5,040 parts per million (ppm) based on 4 cycles of operation and a makeup water concentration of about 1,260 ppm TDS/TSS. As drift droplets are emitted and deposited downwind from the cooling towers, the minerals in the circulating water may be deposited on adjacent structures. The maximum mineral deposition rates are provided in Appendix B, which indicated very low mineral deposition rates. The distribution of mineral deposition are illustrated on Figures 20 through 24.

While there are no environmental thresholds that regulate mineral deposition from cooling tower, excessive mineral deposition on facility components may cause operational problems. The Institute of Electrical and Electronics Engineers (IEEE) has suggested a mineral deposition rate for common salt (NaCl) of $0.03 \text{ mg/cm}^2/\text{month}^3$ as a threshold on electrical components above which increased incidents of insulator failure and flashover may occur.

In order to meet the anticipated Best Available Control Technology/Lowest Achievable Emission Rate (BACT/LAER) requirements of the air permit for this proposed facility, the cooling tower drift will be minimized using high-efficiency drift eliminators with an efficiency of 0.001 percent of the circulating water rate. Furthermore, the cooling tower would be emitting CaCO_3 , which is substantially less electrically conductive than common salt. The maximum predicted mineral deposition rate for the existing cooling tower is $36.5 \times 10^{-4} \text{ mg/cm}^2/\text{month}$ (0.000365), occurring about 200 meters (or roughly 650 feet) east of the Fox 1&2 cooling tower during the summer season. This value is substantially (2 orders of magnitude) below the minimum mineral deposition rate threshold for salt deposition ($0.03 \text{ mg/cm}^2/\text{month}$). As such, the mineral deposition is not anticipated to exceed IEEE thresholds either on or off the facility property, due to the cooling tower high-efficiency drift eliminators and fairly low circulating water TDS concentration. The mineral deposition rates for Fox 3 Options 1 and 2 are similar to Fox 1&2 and are also generally confined to the facility property. The $0.0006 \text{ mg/cm}^2/\text{month}$ deposition modeled contours extends off of the property towards the north, however at this distance the large droplets will have fallen out on the facility property and any remaining small

³ Grigsby, L.L. (2001). The Electric Power Engineering Handbook. CRC Press. Pp 4-28, 4-29

droplets will have evaporated to become airborne total suspended particulate (TSP) such that any deposition will be insignificant to none.

Terrain Effects on Plume Impacts

The SACTI program for calculating cooling tower plume impacts assumes that the surround terrain is level and has uniform ground cover. However, the authors of the SACTI program codes recognize that the program may be used to assess cooling towers that are in uneven, hilly, and even complex terrain (where the terrain is above the tower outlet) and the predicted plume frequencies may be altered by the surrounding terrain. To this end, the authors have prepared Appendix D – *Guidelines for Plume Prediction in Complex Terrain* to the SACTI user's guide that describes the basic physics of the airflow and plume behavior for five ideal types of complex terrain and recommended procedures for adjusting (or not adjusting) the plume frequency tables to account for terrain interactions.

TRC has examined the terrain surrounding the proposed facility site (which is generally flat or slightly descending in elevation towards the Fox River to the south and east. TRC concluded that the within the area where the cooling tower plume may impact the ground (i.e., plume fogging and icing) there are no conditions where plume frequency adjustments would be warranted due to slight or no plume interaction with terrain. Furthermore, the SACTI user's manual recommends no terrain adjustments be applied for plumes occurring in uniformly sloping terrain, since the plumes tend to follow the slope of the terrain. As such, the model results were applied as with no adjustments made.

CONCLUSIONS

The potential condensed water vapor plumes for the cooling towers being examined at the Fox Energy Center were examined using the SACTI cooling tower assessment model. Five years of site representative hourly meteorological data were used to determine the plume impacts. The following conclusions may be drawn from the study.

- An estimated 22 to 23 hours of predicted ground fog may occur in an average year on the Fox Energy Center property at the location of maximum impact on-site. The operating personnel will need to be mindful of any reduced visibility on-site during such fogging events. Both the existing cooling tower and the proposed Fox 3 cooling tower may have ground fogs that would extend west and southeast that may impact the local highways.
- It is estimated that up to 9 to 12 hours of predicted on-site rime icing may occur in an average year. The rime ice hours will be associated with fogging events, and plant personnel will need to be aware of possibly slippery walkways and exposed metal stairs on the process equipment during fogging conditions in sub-freezing weather. Several hours of rime ice potential may occur towards the southeast of the existing cooling tower and Option 2 location for Fox 3 cooling tower on Highway 96.
- The majority of the elevated visible plumes are generally confined to the area immediately over the cooling towers and over the facility site itself. Only a few visible plumes may extend any appreciable distance, approximately several kilometers towards the east and west.

- The mineral deposition is expected to be minimal and inconsequential due to the low TDS in the circulating water and the use of a high efficiency drift eliminator. The electrical equipment should not be impacted by the low amounts of mineral deposition as the maximum deposition rate is well below the potential impact threshold for salt deposition, that may cause arcing and conductor failure with electrical components. Any mineral deposition that may occur offsite is expected to be trivial to none.

Table 1
Cooling Tower Operating Parameters⁽¹⁾

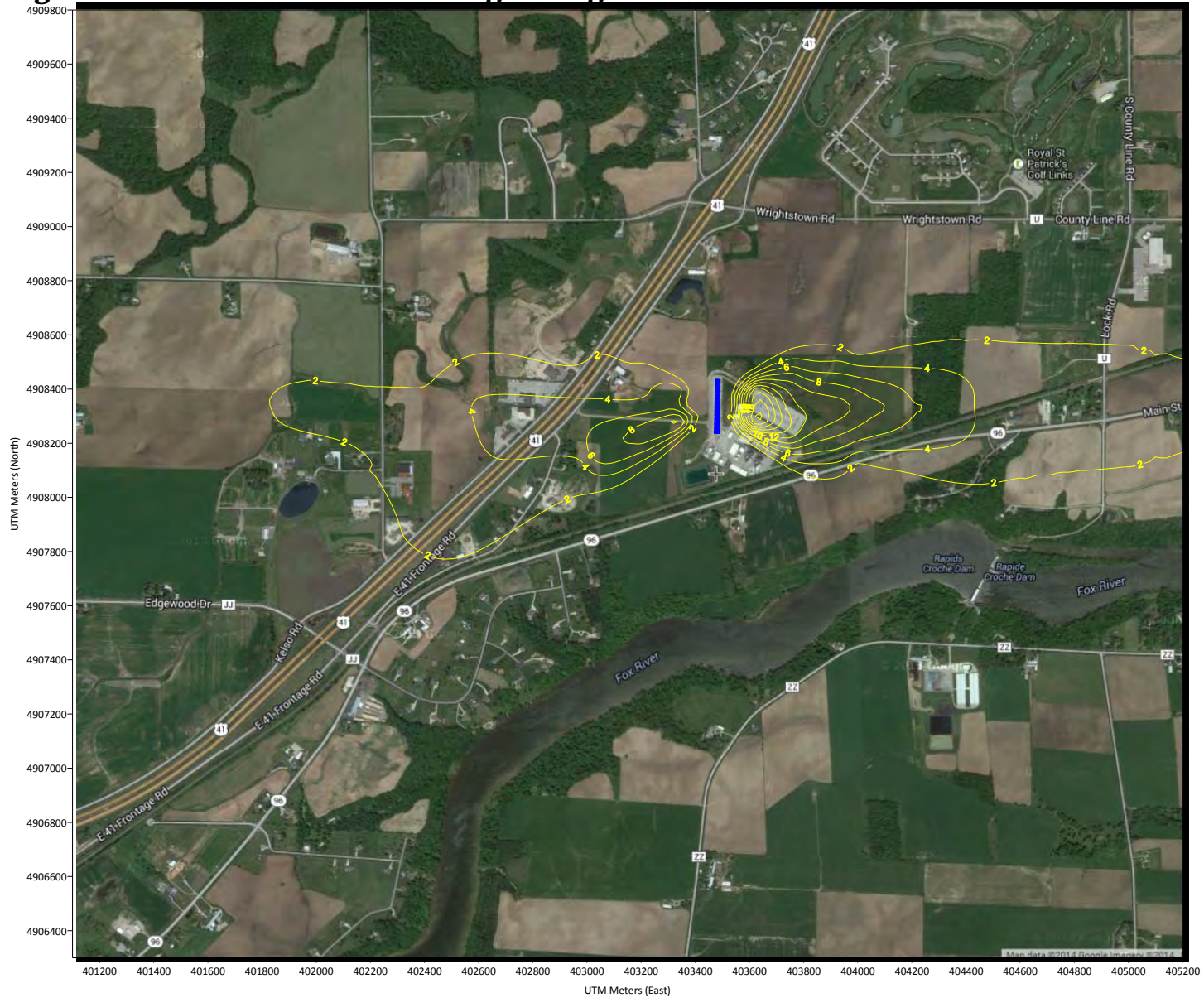
<u>Parameter</u>	<u>Evaluated Cooling Towers</u>	
	<u>Fox 1 & 2</u>	<u>Fox 3</u>
-	<u>Linear Mechanical Draft</u>	<u>Linear Mechanical Draft</u>
Tower Loading Case		
Worst case summer load for full year ⁽²⁾ :	100% of Tower Heat Duty	100% of Tower Heat Duty
Tower Orientation and Configuration	N/S	NE/SW (Options 1&2)
Number of Cells:	12 (1 x 12)	6 (1 x 6)
Tower Height (top of fan) (feet):	38	41.5
Tower Length (feet):	648	324.67
Tower Width (feet):	54	45.67
Cell Diameter (feet):	28	33.5
Tower Effective Diameter ⁽³⁾ (feet):	97	82.06
Total Tower Heat Duty ⁽⁴⁾⁽⁵⁾ (MWt):	502	333
Total Tower Heat Duty ⁽⁴⁾⁽⁵⁾ (MMBtu/hr)	1,712	1,135
Cooling Water Range (°F)	18.7	23.7
Tower Air Flow (ACFM):	18,796,000	8,748,000
Tower Air Flow (Kg/sec):	11,361	5,291
Circulating Water flow (gpm)	183,000	95,967
Circulating Water flow (Kg/sec)	11,475	6,051
Liquid to Gas Ratio	1.00	1.14
Circulating water TDS (ppm as CaCO ₃)	3030	5040
Cycles of concentration	6	4
Drift Elimination efficiency (%)	0.0005	0.0005
Water drift (pounds per hour)	458	240
Particulate emissions (pounds per hour)	1.39	1.21
Site Latitude (degrees North): ⁽⁶⁾	44.321	44.326
Site Longitude (degrees West):	88.209	88.206
<ol style="list-style-type: none"> 1. Preliminary conceptual design and operational parameters provided by Burns & McDonnell Engineering. 2. This represents a level of operation (8,760 hours per year at full summer load operating conditions) that will produce conservatively higher predicted cooling tower impacts. 3. Effective diameter equals the single cell diameter x N^{0.5} (where N = number of cells). 4. Cooling towers examined at full heat duty for the full year of operation. 5. Equals the circulating water rate times the temperature range converted to MW (thermal) and MMBtu/hr. 6. Power block location. Used in SACTI to determine sunrise and sunset times for plume shadowing calculations and is representative for the cooling towers evaluated. 		

**Table 2
Summary of Modeled Cooling Tower Plume Impacts**

cooling tower Examined	Ground Fogging	Rime Icing	Elevated Visible Plumes	Mineral Deposition
	Average Hours (Annual or Season)	Average Hours (Annual or Season)	Average Hours Per Year	(10⁻⁴ mg/cm²/month)
Fox 1 & 2 (100% Load - Annual)	23.4	12.4	765	36.5
Distance to Maximum (meters)	150	150	200	200
Direction towards Maximum	ESE	ESE	ENE	E
Fox 3 Options 1 & 2	22.2	9.0	670	26.4
Distance to Maximum (meters)	100	200	200	200
Direction towards Maximum	E	E	E	ESE
Fox 1&2 with Fox 3 Option 1	23.4	12.4	765	36.5
Distance to Maximum (meters)	150	150	200	200
Direction towards Maximum	ESE	ESE	ENE	E
Fox 1&2 with Fox 3 Option 1	23.4	12.4	765	36.5
Distance to Maximum (meters)	150	150	200	200
Direction towards Maximum	ESE	ESE	ENE	E

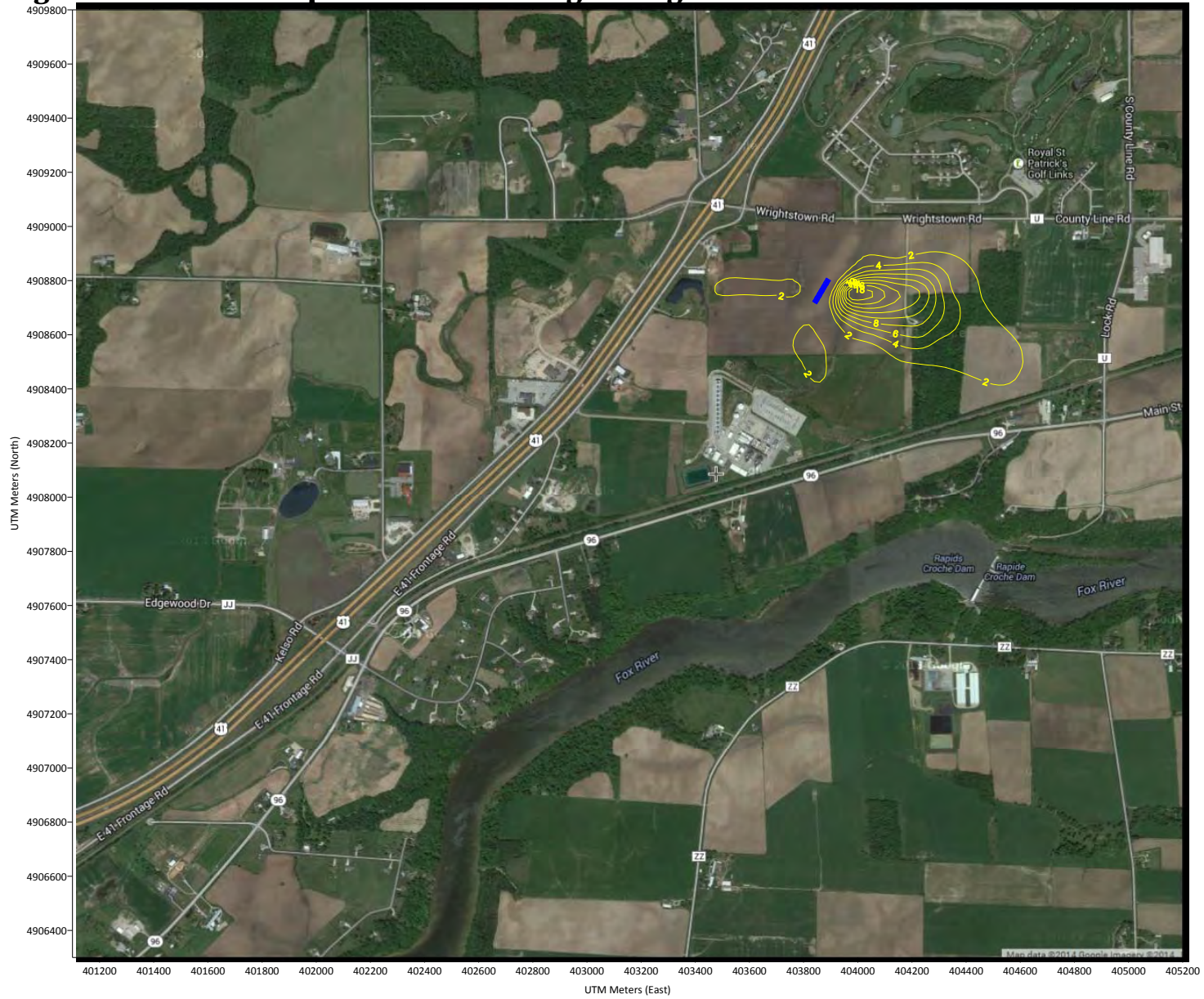
Note that the overall maximum is associated with Fox 1&2 cooling tower.

Figure 5: WPS Fox 1&2 - Ground Fog Average Hours Per Year



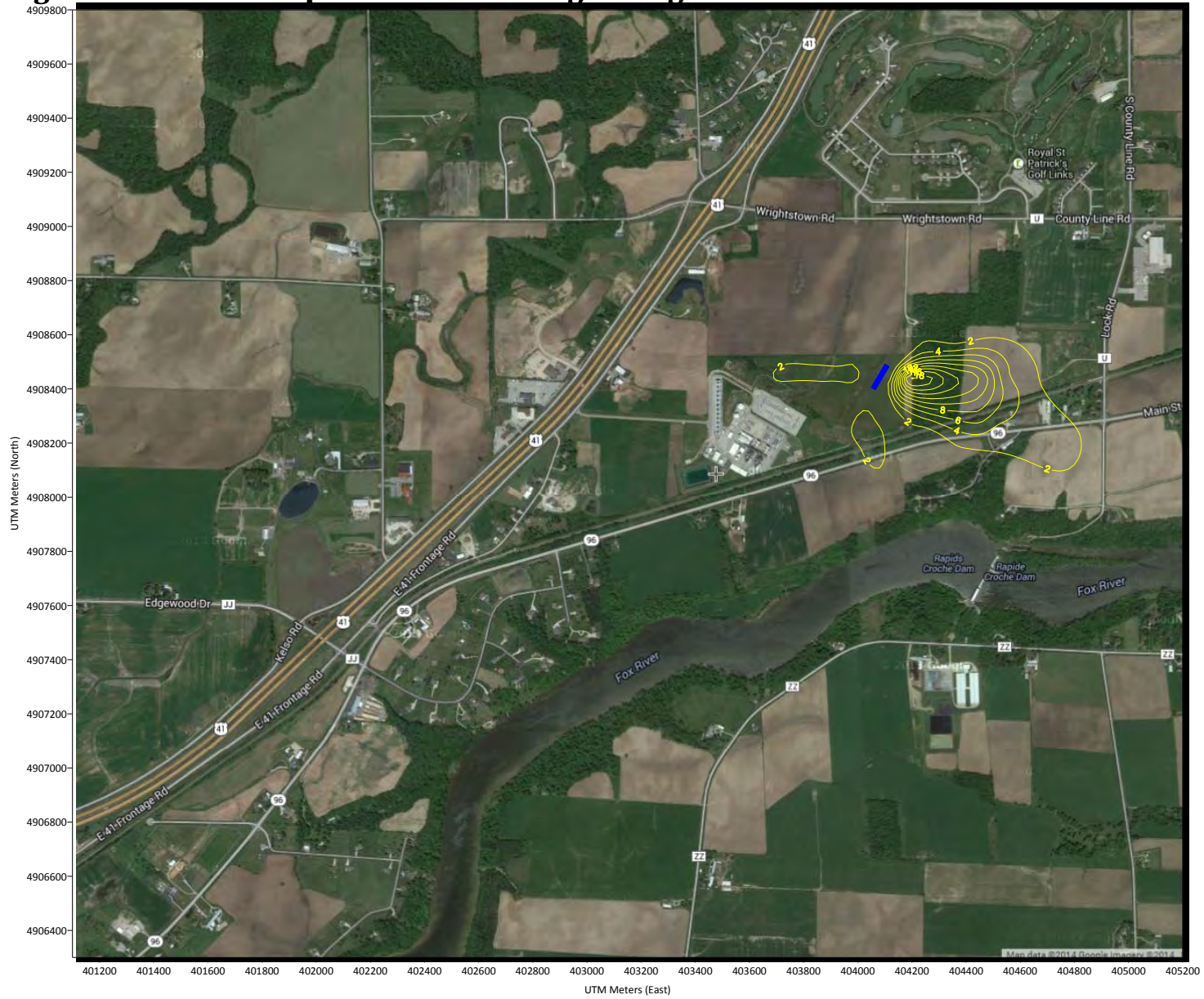
Note: contours represent average hours per year

Figure 6: WPS Fox 3 Option 1 - Ground Fog Average Hours Per Year



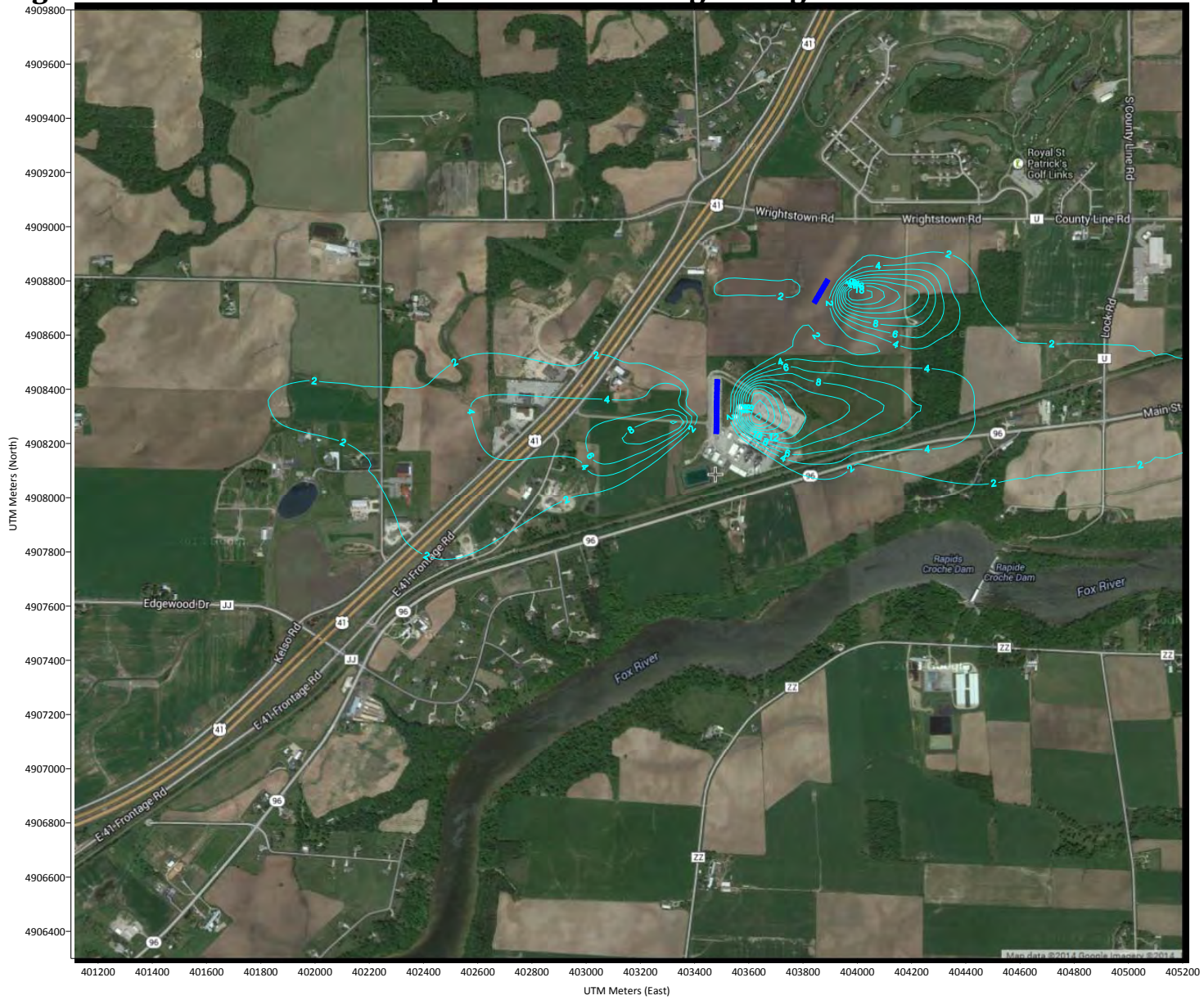
Note: contours represent average hours per year

Figure 7: WPS Fox 3 Option 2 - Ground Fog Average Hours Per Year



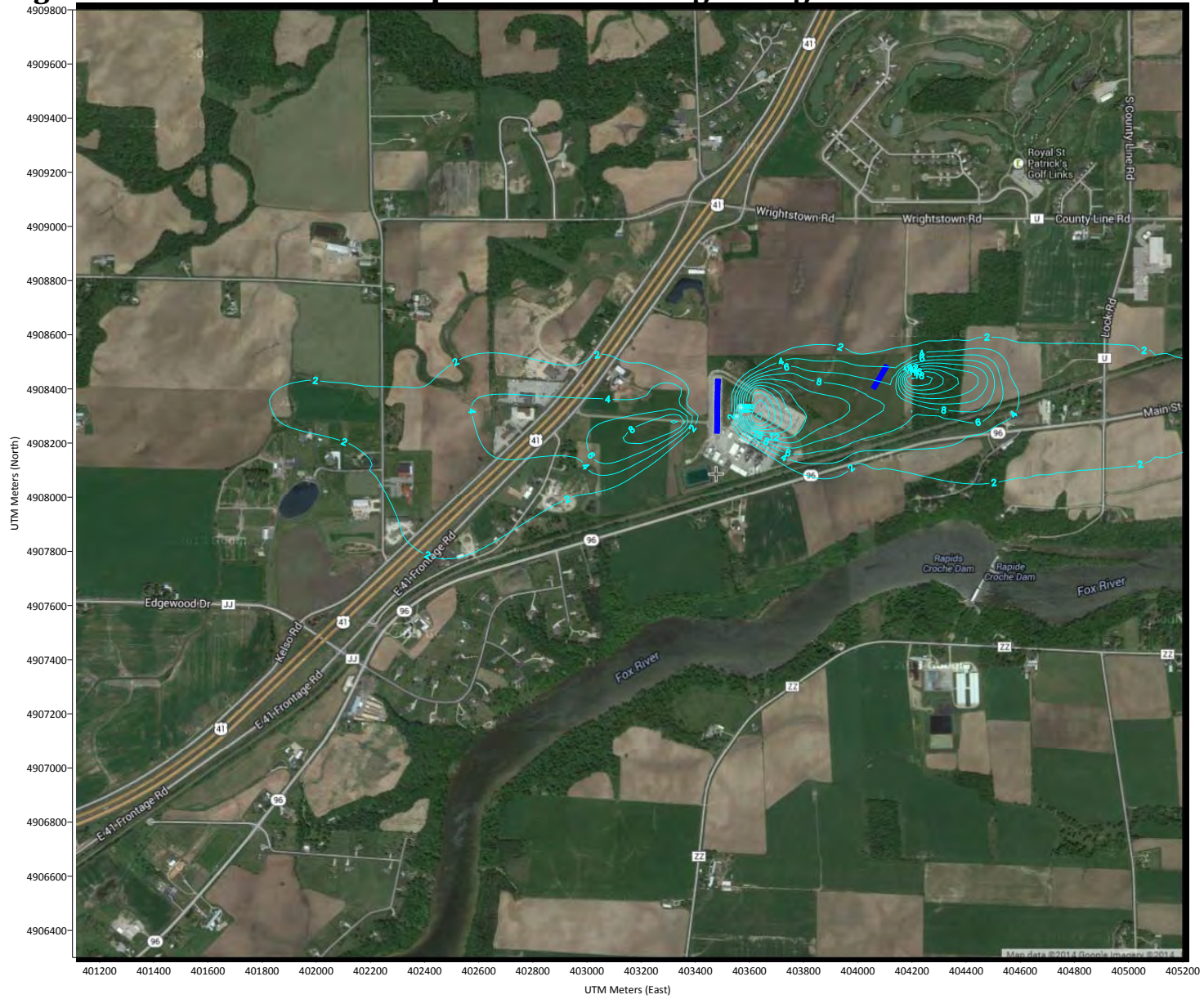
Note: contours represent average hours per year

Figure 8: WPS Fox 1&2 with 3 Option 1 - Ground Fog Average Hours Per Year



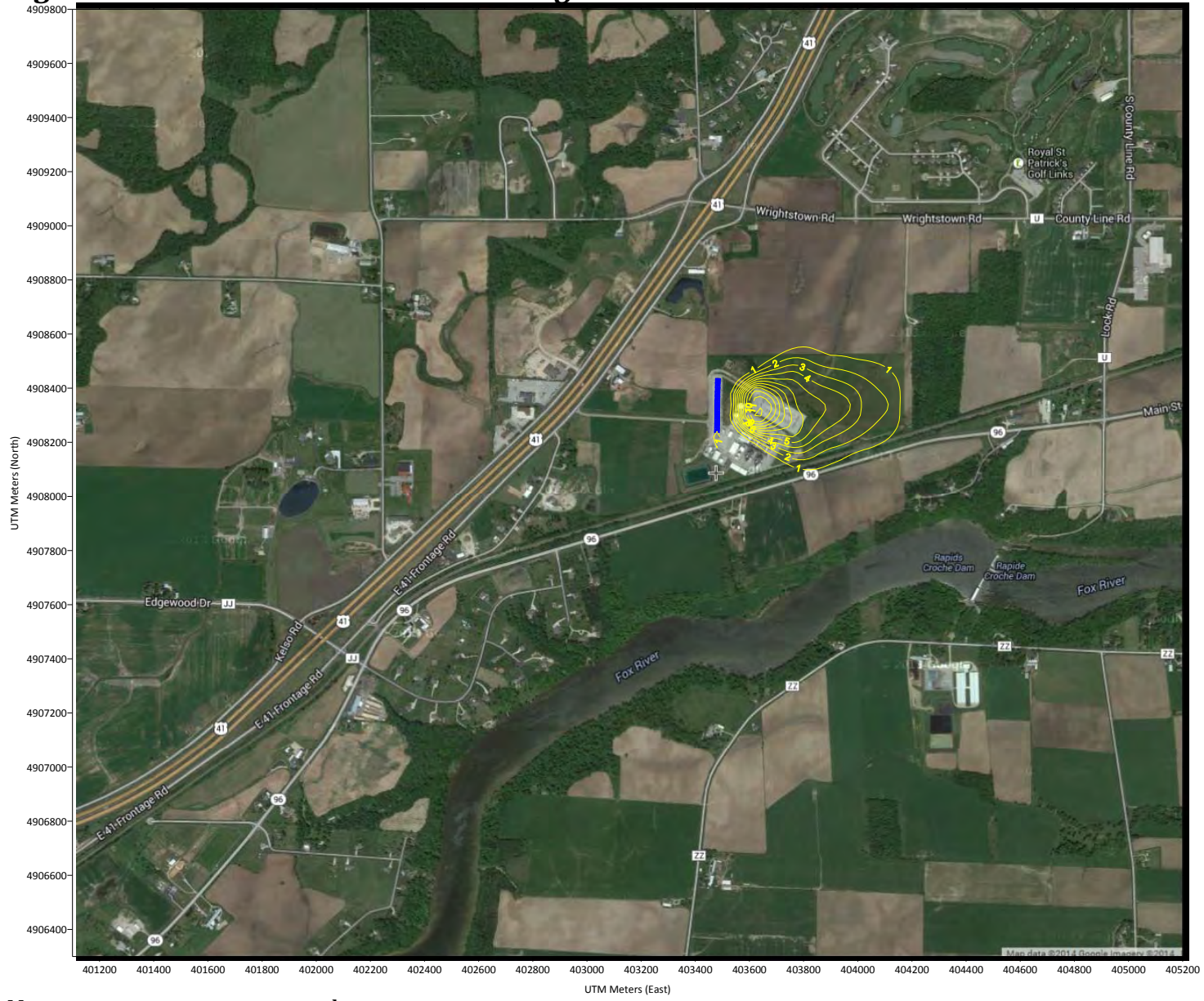
Note: contours represent average hours per year

Figure 9: WPS Fox 1&2 with 3 Option 2 - Ground Fog Average Hours Per Year



Note: contours represent average hours per year

Figure 10: WPS Fox 1&2 - Rime Ice Average Hours Per Year



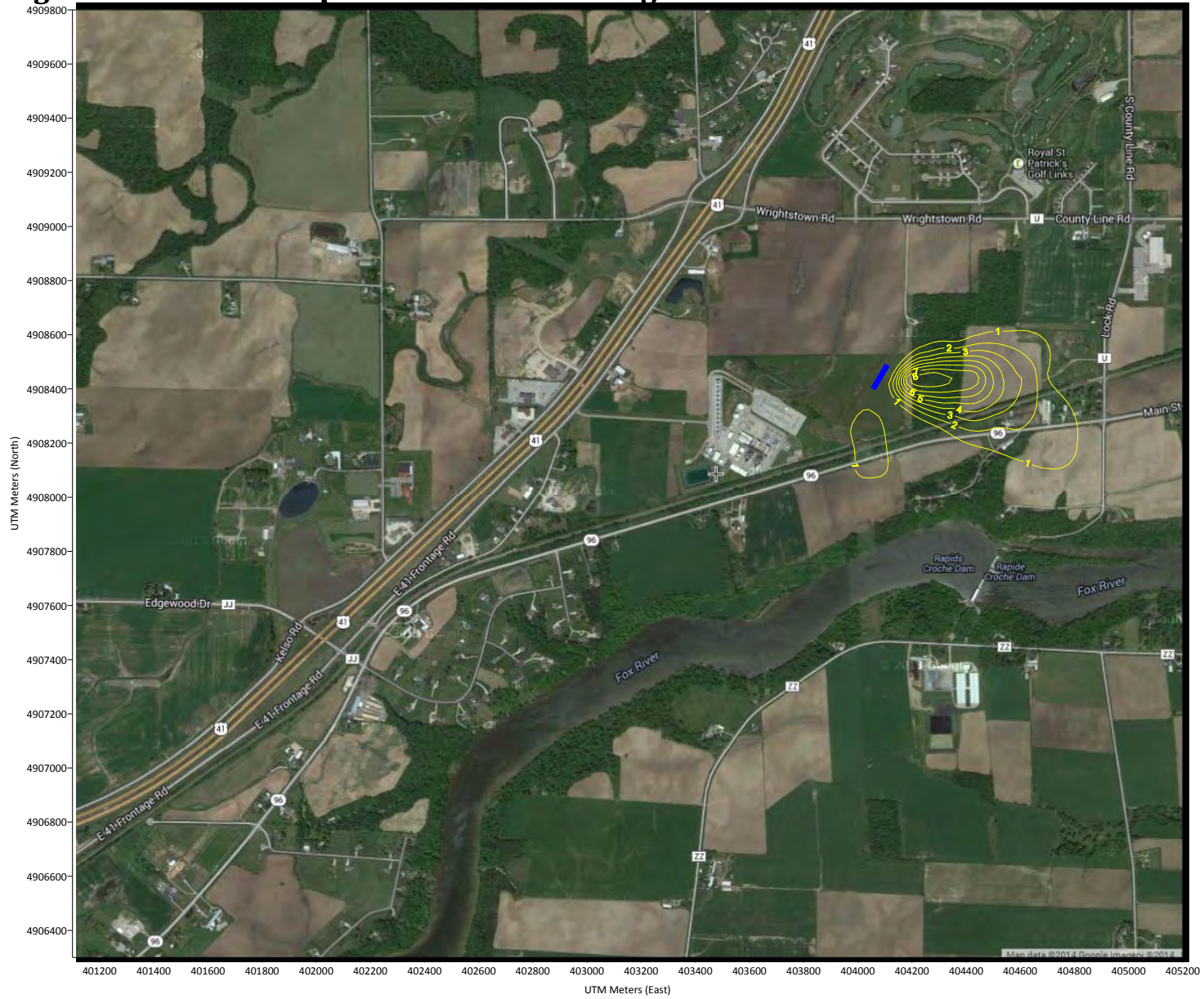
Note: contours represent average hours per year

Figure 11: WPS Fox 3 Option 1 - Rime Ice Average Hours Per Year



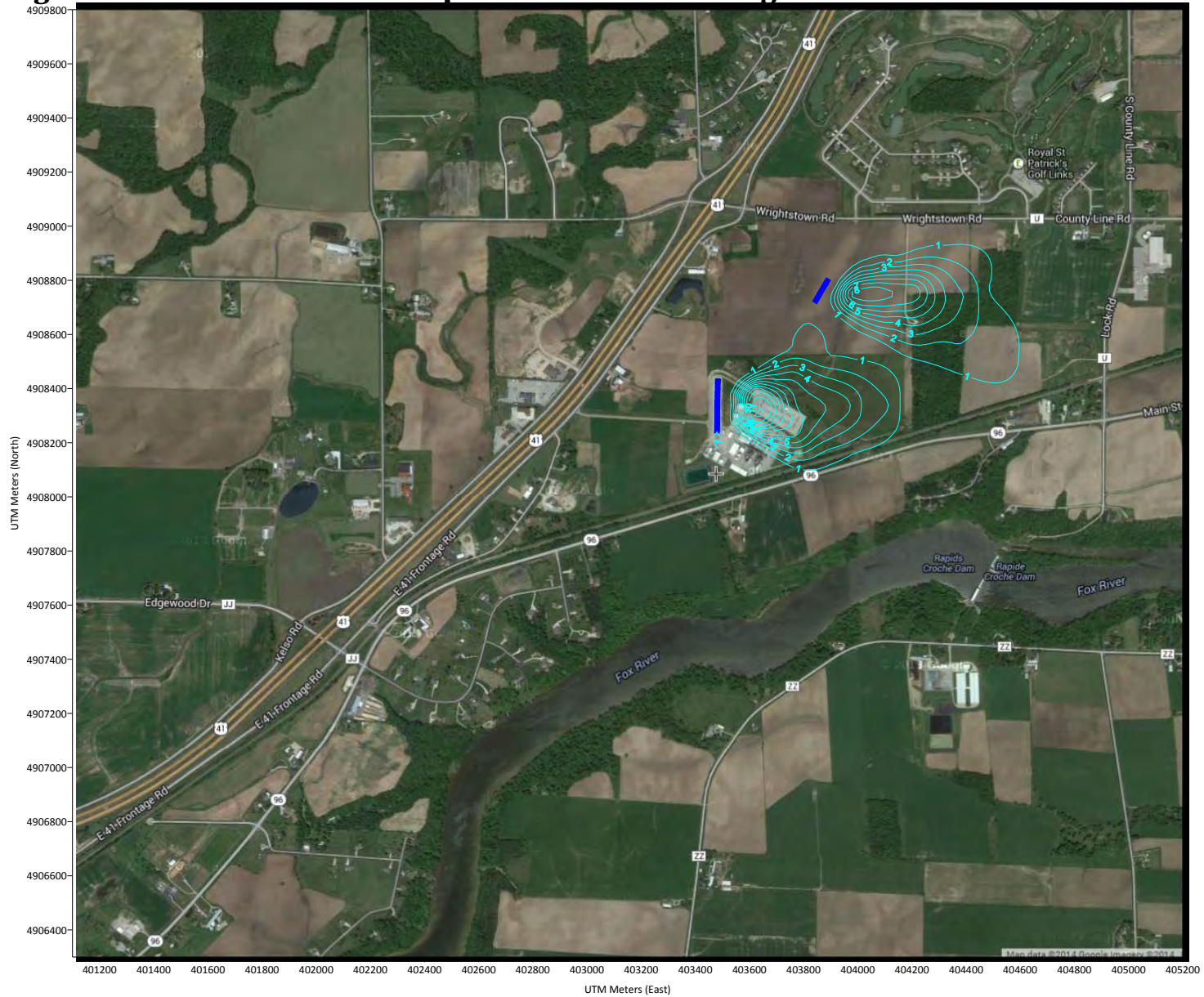
Note: contours represent average hours per year

Figure 12: WPS Fox 3 Option 2 - Rime Ice Average Hours Per Year



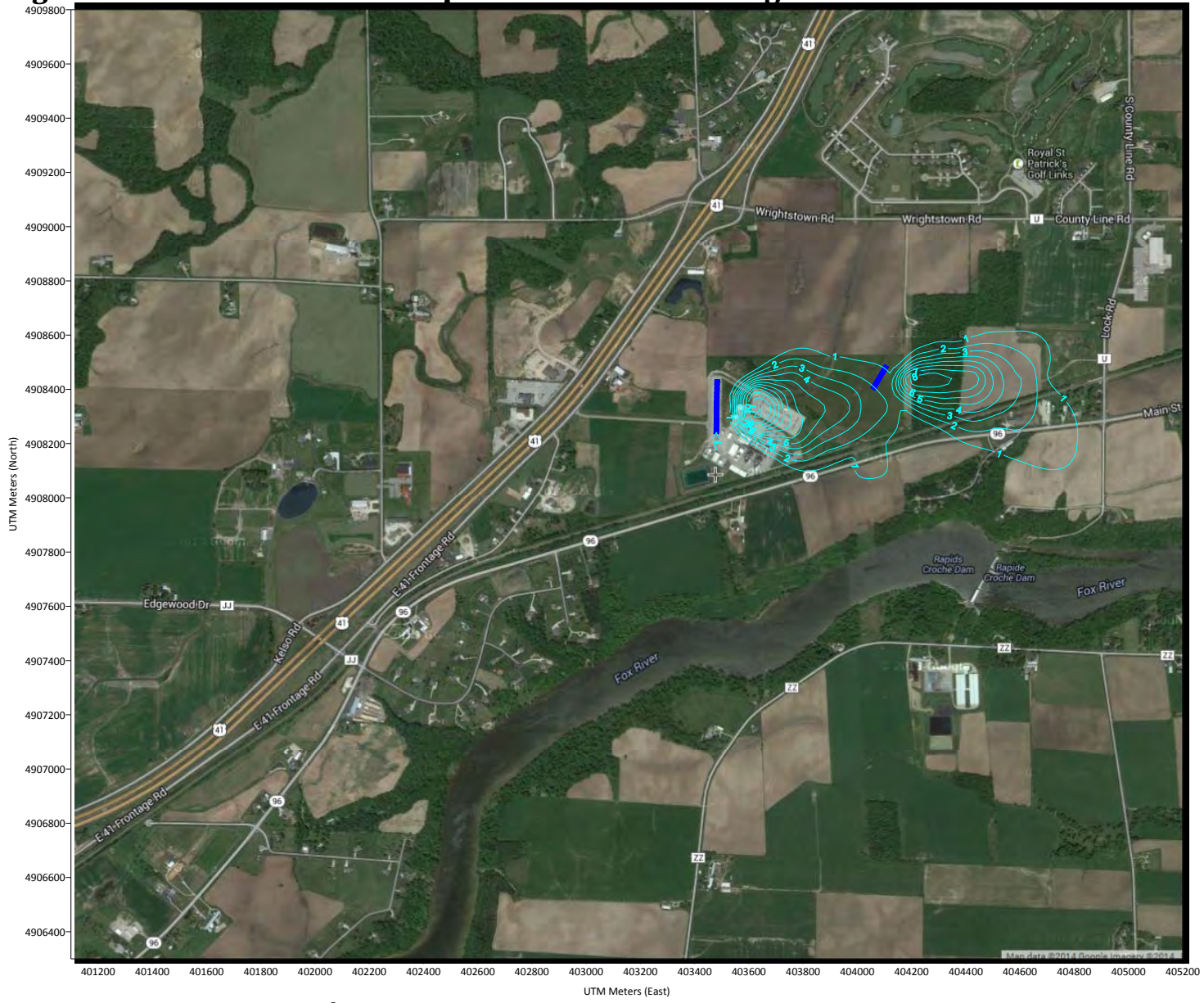
Note: contours represent average hours per year

Figure 13: WPS Fox 1&2 with 3 Option 1 - Rime Ice Average Hours Per Year



Note: contours represent average hours per year

Figure 14: WPS Fox 1&2 with 3 Option 2 - Rime Ice Average Hours Per Year



Note: contours represent average hours per year

Figure 15: WPS Fox 1&2 - Elevated Visible Plume Average Hours Per Year

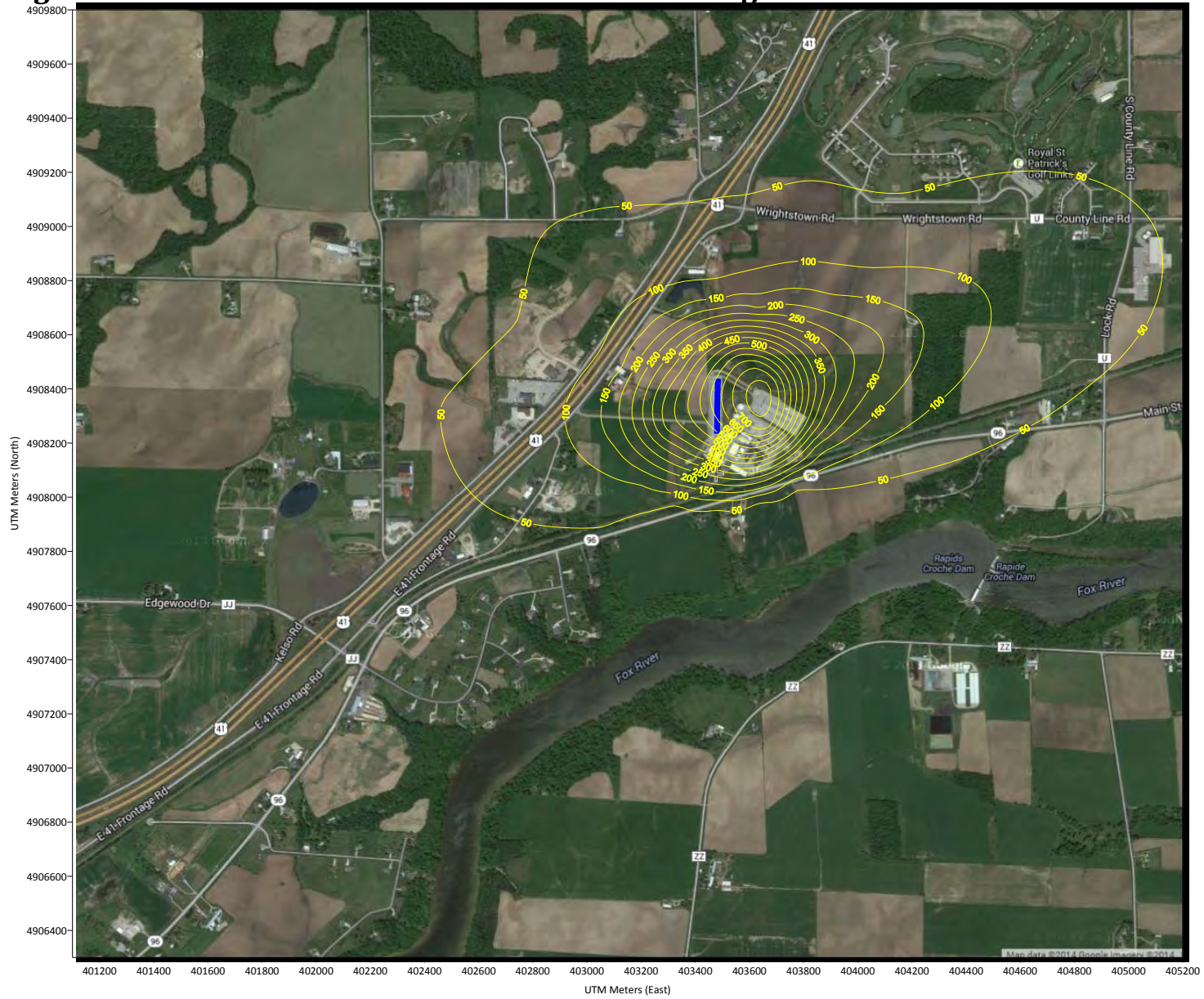
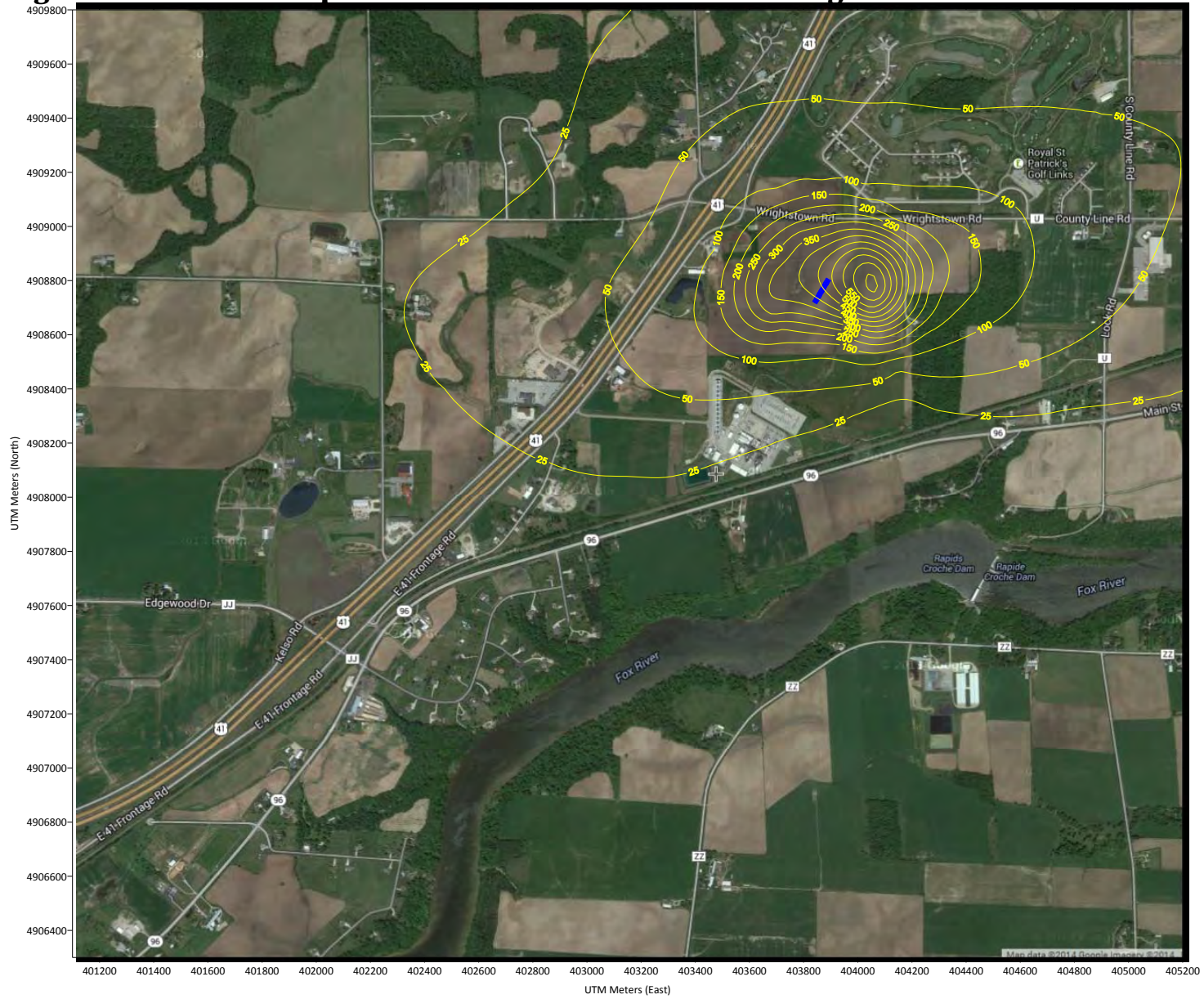
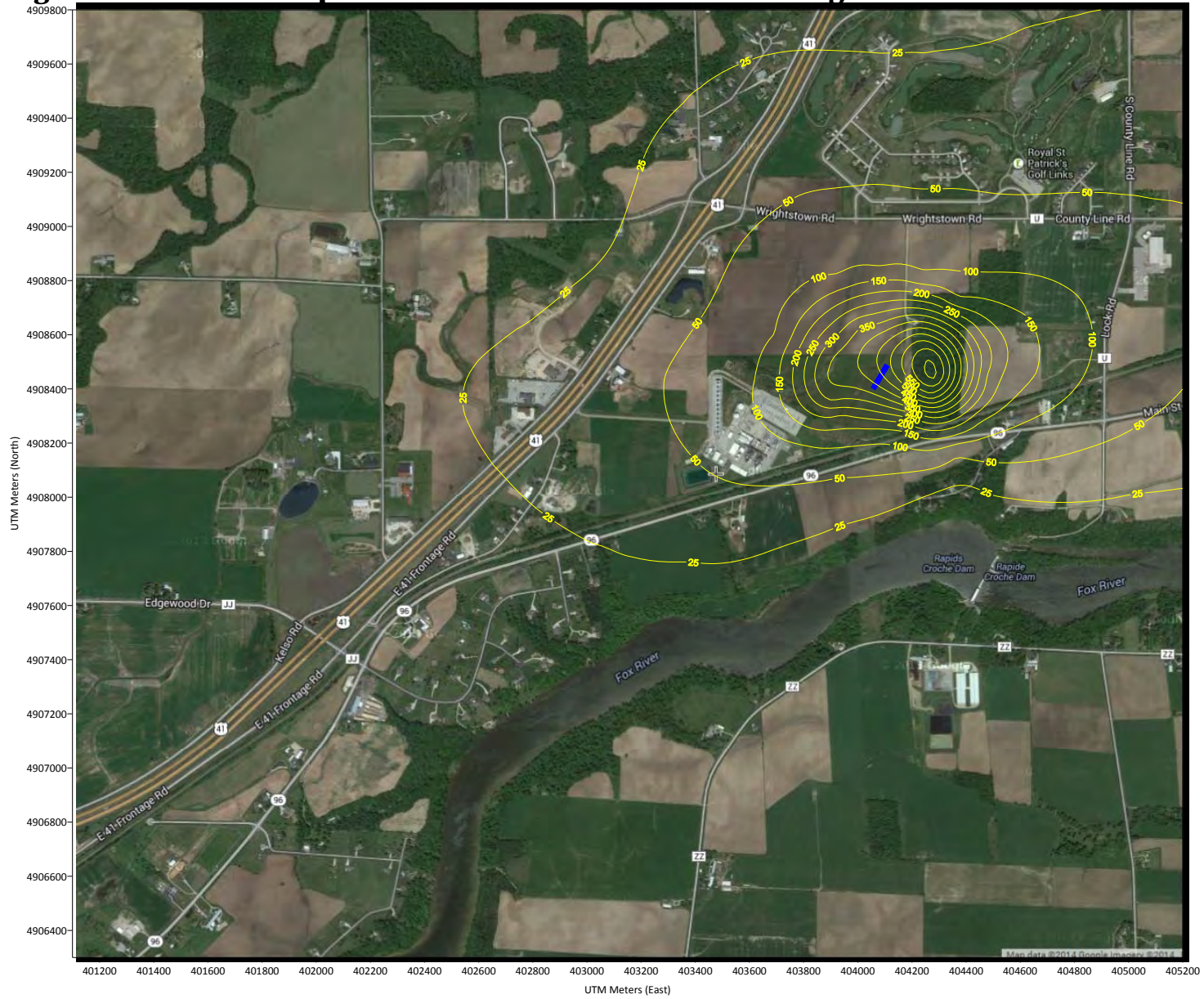


Figure 16: WPS Fox 3 Option 1 - Elevated Visible Plume Average Hours Per Year



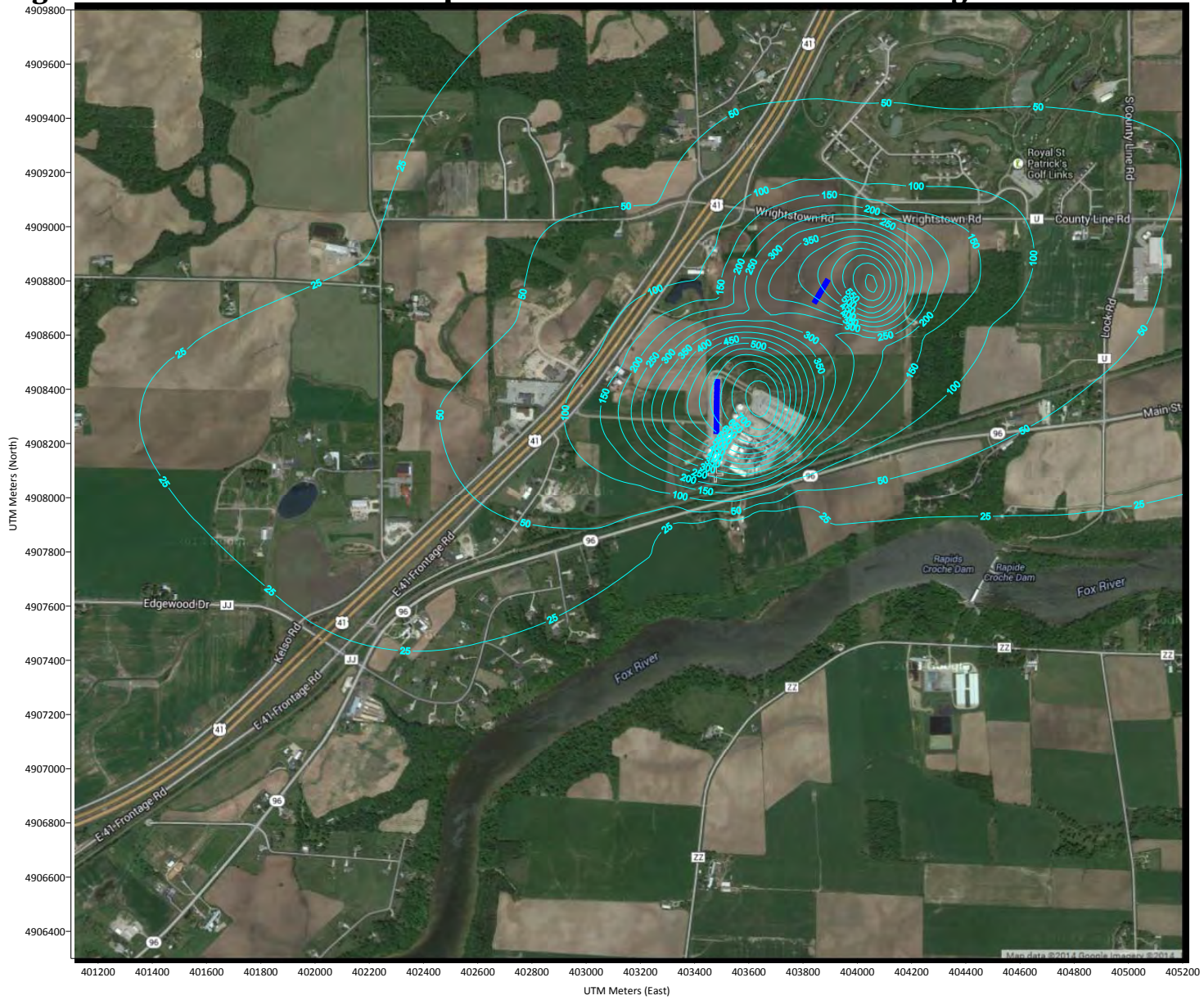
Note: contours represent average hours per year

Figure 17: WPS Fox 3 Option 2 - Elevated Visible Plume Average Hours Per Year



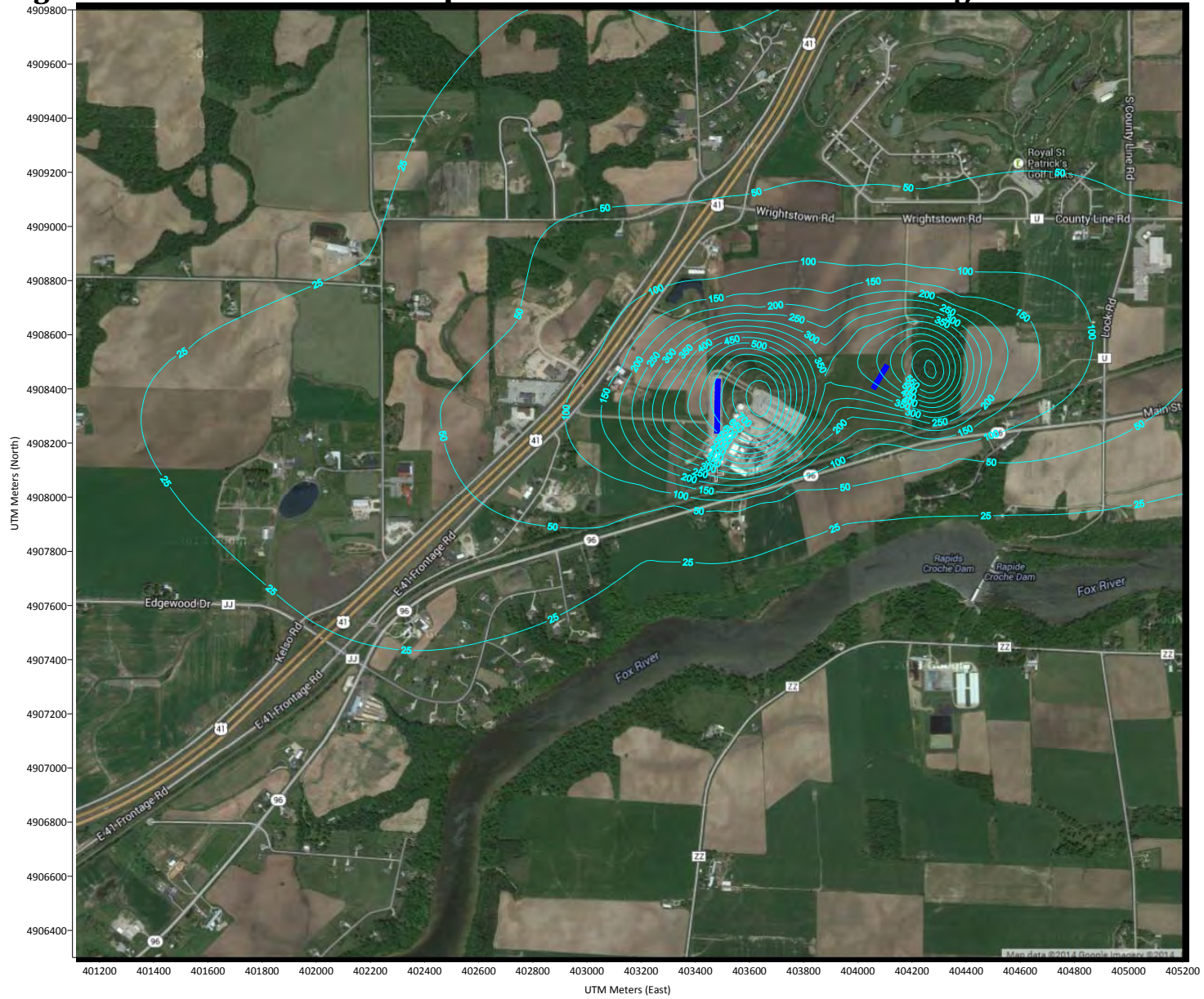
Note: contours represent average hours per year

Figure 18: WPS Fox 1&2 with 3 Option 1 - Elevated Visible Plume Average Hours Per Year



Note: contours represent average hours per year

Figure 19: WPS Fox 1&2 with 3 Option 2 - Elevated Visible Plume Average Hours Per Year



Note: contours represent average hours per year

Figure 20: WPS Fox 1&2 - Mineral Deposition (10^{-4} mg/cm²/month)



Figure 21: WPS Fox 3 Option 1 - Mineral Deposition (10^{-4} mg/cm²/month)

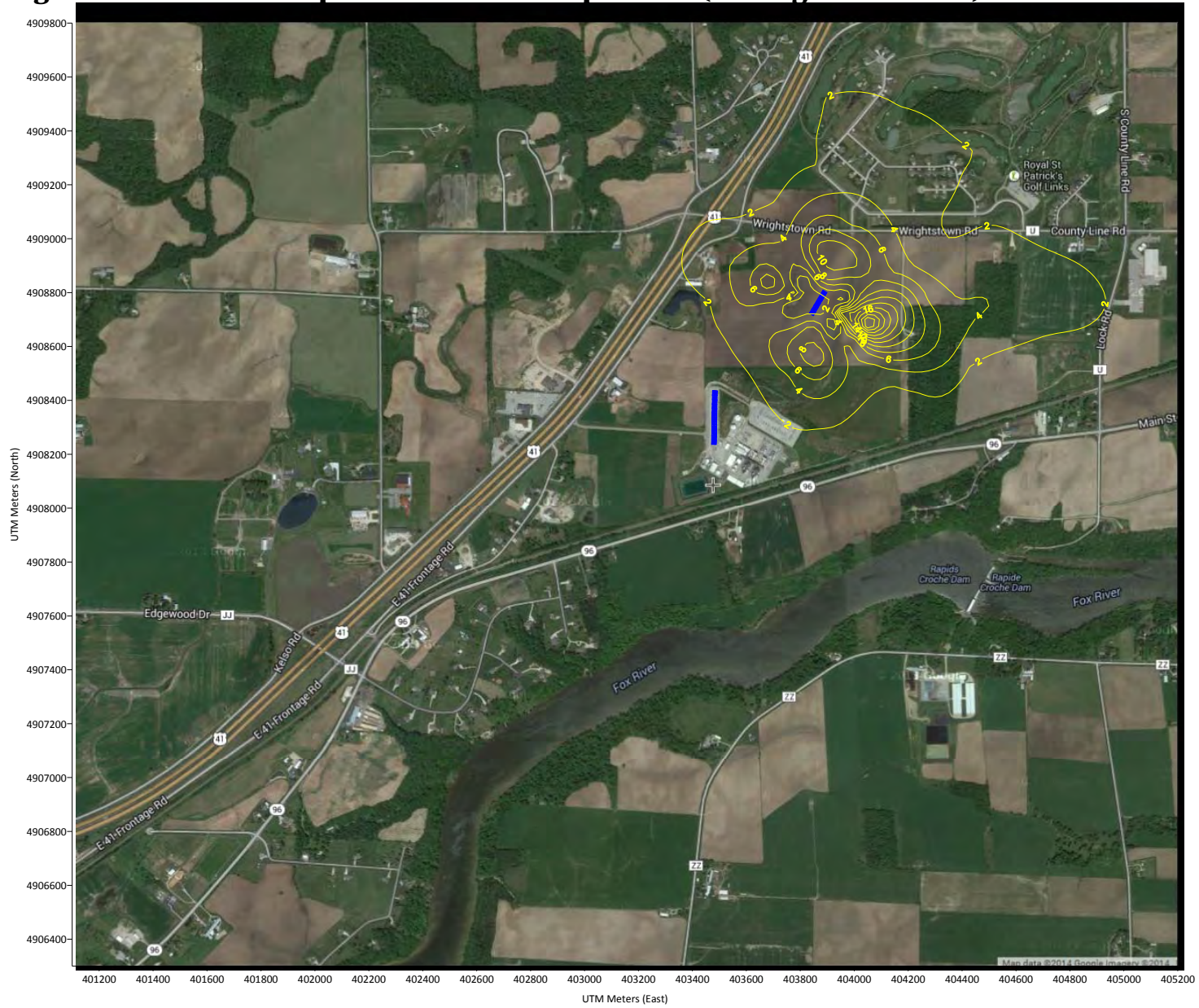


Figure 22: WPS Fox 3 Option 2 - Mineral Deposition (10^{-4} mg/cm²/month)

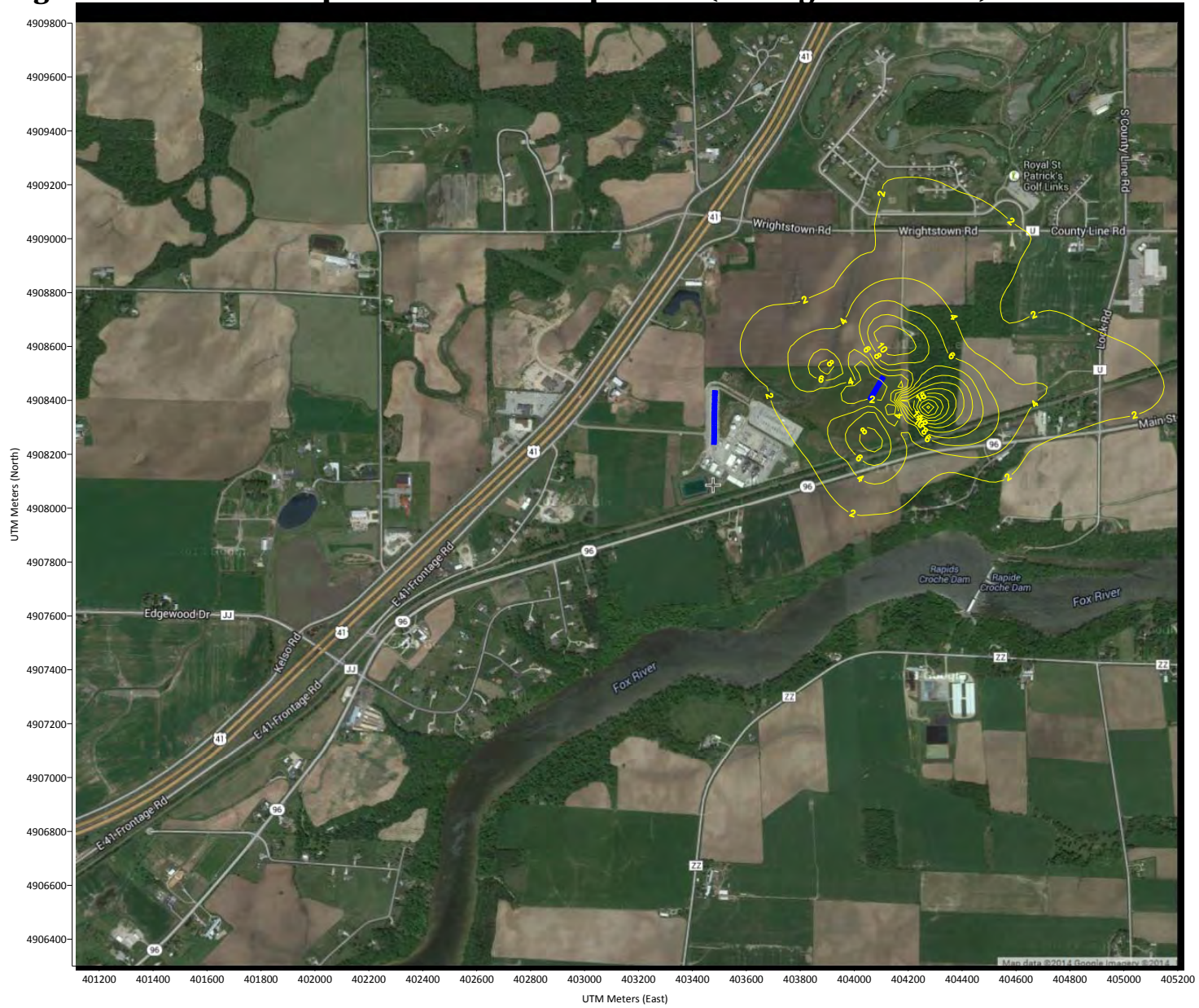


Figure23: WPS Fox 1&2 with 3 Option 1 - Mineral Deposition (10^{-4} mg/cm²/month)

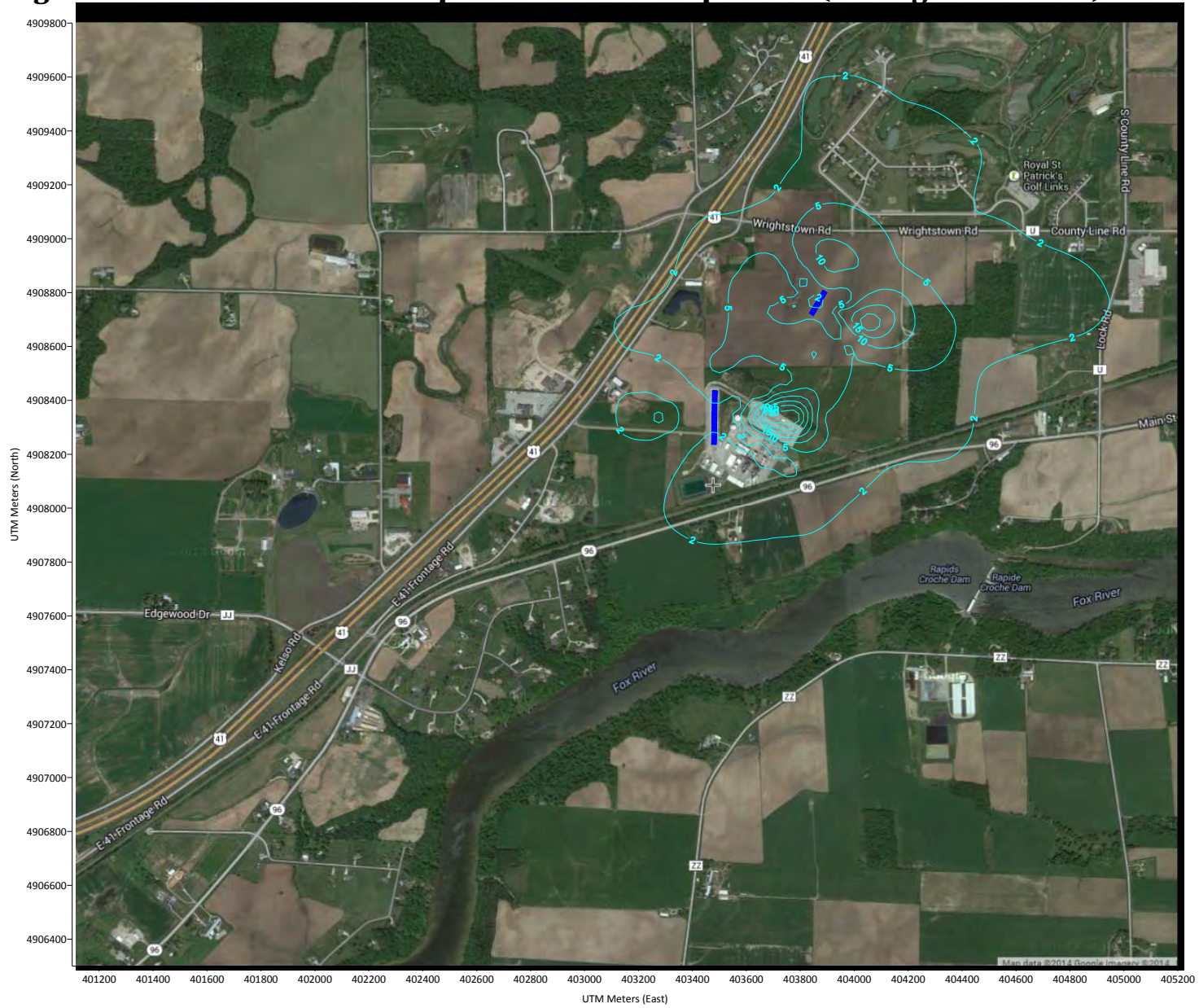
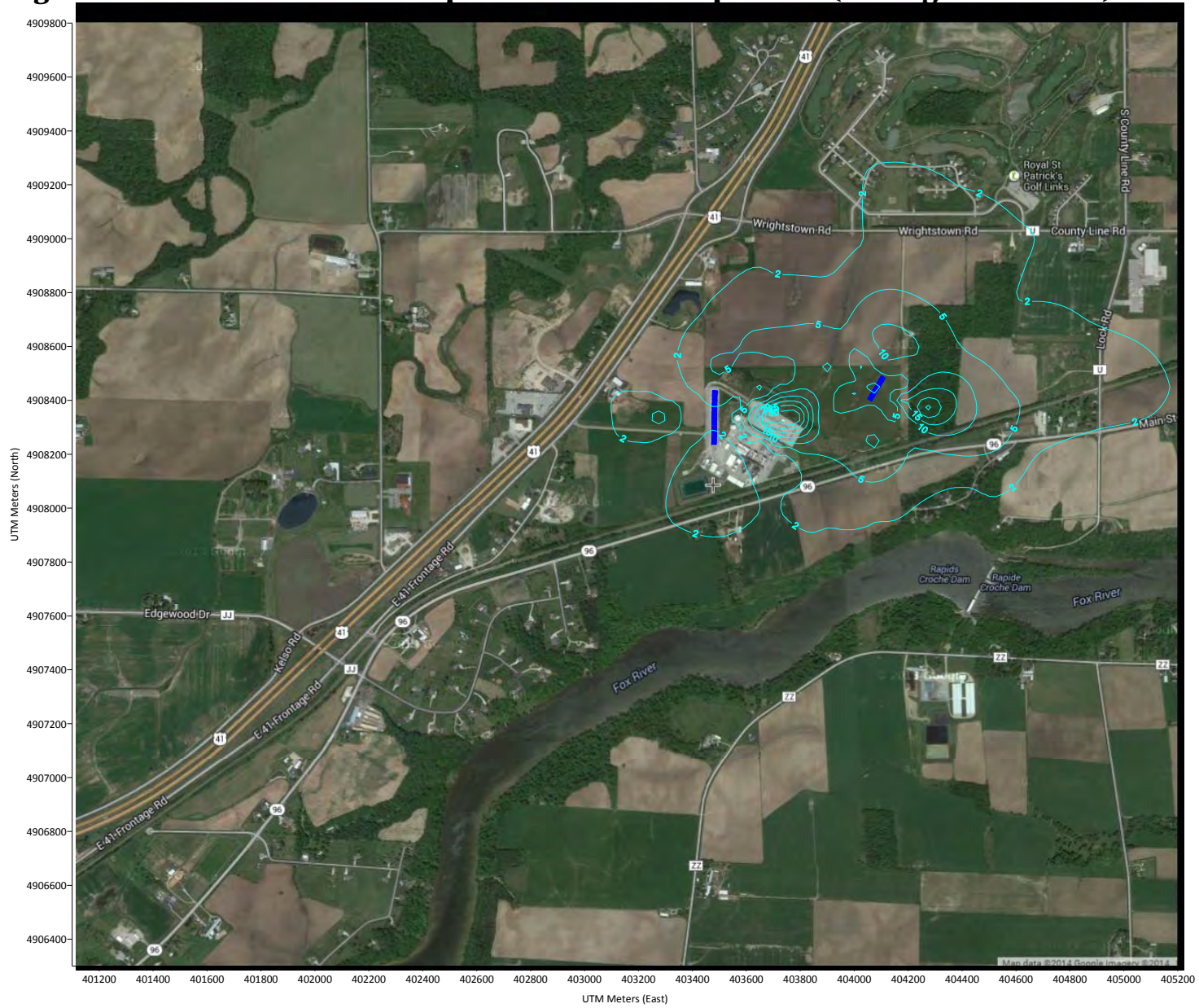


Figure 24: WPS Fox 1&2 with 3 Option 2 - Mineral Deposition (10^{-4} mg/cm²/month)



APPENDIX A

SACTI Model Description

The EPRI SACTI cooling tower model calculates the seasonal and annual impacts of cooling tower exhaust plumes. Various environmental impacts simulated in the SACTI model include:

- plume-induced ground fogging and rime icing (during freezing conditions) downwind of the cooling tower
- visible plume length and height
- deposition of minerals (salt) contained in cooling tower plume drift (water droplets entrained in the plume during plume exhaust)

The SACTI model is a multiple-source model that predicts cooling tower plume impacts from any number of identical natural draft, linear mechanical draft, or circular mechanical draft cooling towers. The SACTI model was designed to provide predictions that can be used in the licensing of power plants with cooling towers. The original SACTI model developers validated the model's predicted output with field and laboratory data and it is the recognized modeling standard used by industry and agency alike.

The seasonal/annual modeling methodology employed by the SACTI model is a parameterization scheme that reduces the available hourly meteorological data to between 30 and 100 categories (typically 35-45 plume categories are used) of unique meteorological conditions (from a cooling tower plume dispersion perspective). Potential ground fogging and rime icing cases are reduced to a predefined 10 categories, which are assumed by the model to be the result of aerodynamic downwash in the lee (downwind side) of the cooling tower. Plumes that are rapidly brought to the ground due to aerodynamic effects will always be lower in height than the tower. The elevated plumes will typically be at or higher than the height of the tower. Rime icing events are tabulated by SACTI when a ground fog event occurs while the ambient temperature is also at or below freezing (32 °F).

Each category is modeled separately and the modeling results of the category are assumed to apply for all occurrences of the category for the period for which modeling is performed. The number of specific categories for a given situation is dependent upon the cooling tower geometry, tower emission parameters, and the meteorological conditions experienced at the site. The categorization scheme used in the SACTI model allows a user to analyze multiple years of meteorological data without the need to model every hour of every year to determine plume impacts. The representative scenarios are assumed to apply for multiple hours, thereby greatly reducing computer execution time. However, as discussed earlier, because SACTI is a statistically based model, a large meteorological database is recommended to provide a large selection of meteorological conditions.

SACTI Suite of Program

The SACTI model is composed of four separate programs: a meteorological preprocessing program (PREP); a plume dispersion program (MULT); a program to produce tabular summaries of the modeling results (TABLES); and a graphical postprocessor program

(PAGE).

To begin a SACTI modeling analysis, the PREP program reads a sequential hourly meteorological data file and generates a set of meteorological scenarios that produce significant plume dispersion effects. The MULT program then computes the expected plume dispersion for each meteorological scenario developed by PREP. The output of the PREP program is a sequential hourly listing of the meteorological conditions and plume dispersion category for each hour of meteorological data processed. The output from the MULT program is a listing of the plume dispersion and fogging impacts for each meteorological scenario (category) simulated.

The TABLES program combines the output of the PREP and MULT programs and produces a set of tabular frequency of occurrence listings of the various environmental effects produced by the cooling tower plume. The environmental effects computed by the TABLES program are the average of the individual impacts of each scenario model weighted by the number occurrences of that scenario in the input PREP data file.

The post-processing program, PAGE, produces computer page plots of the output from the TABLES program. Only the first three programs were needed for this analysis. Graphical post-processing was performed using a separate graphics package, rather than the PAGE program.

The SACTI-PREP model generates five scenarios that are assumed to produce cooling tower plume rime icing and ground fogging, and five additional scenarios that produce cooling tower plume ground fogging only. Because plume ground fogging and rime icing occur during plume downwash conditions, and downwash is assumed to be different for circular and linear cooling towers of the same size, the rime icing and ground fogging scenarios for these two tower types are different. These 10 scenarios are independent of individual tower or plume geometry characteristics, except that plumes from natural draft cooling towers are assumed not to produce ground level fogging and rime icing.

An additional number of scenarios are also developed that are functions of the meteorological conditions occurring in the input meteorological data. These scenarios depend upon observed wind speed, dry bulb and dew point temperatures, atmospheric stability, and other meteorological factors, in addition to specific cooling tower parameters. These scenarios can vary with the specific cooling tower modeled and are used to estimate the potential for rime icing and ground fogging impacts. A total of 10 downwash (ground fogging and rime icing scenarios) and 35 plume scenarios were used by SACTI for the Project's cooling tower analysis.

Mineral deposition is simulated by SACTI by calculating the amount of liquid water that is emitted by the tower through drift (liquid water droplets that are entrained in the exhaust flow). The drift contains dissolved minerals, predominately calcium carbonate with fresh water for makeup, and any anti-scaling agents used to treat the circulating water. The drift droplets are modeled as a tilted plume, causing deposition of the droplets in the immediate vicinity of the tower. If sufficiently heavy, the mineral deposition will manifest itself as a white film on surfaces and can be particularly noticeable on vehicles

(i.e. windshield and windows) that may be parked adjacent to the tower for any extended period of time (days or weeks). Normally, such deposition is not an issue unless the circulating water contains a high concentration of sodium chloride (NaCl).

Appendix B
SACTI Modeling Output Tables

Table B-1
Fox 1&2 – Wet Mechanical Draft (WMD) Cooling Tower
Average Annual Plume Fogging Hours

Distance (M)	Direction Plume is Headed															
	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
50	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100	2.1	0.2	0.4	4.8	0.1	0.9	0.0	0.1	0.2	0.1	2.0	10.9	12.7	13.8	2.9	0.2
150	1.6	0.5	0.8	11.3	4.5	5.4	0.0	0.0	0.2	0.3	2.6	18.9	21.2	23.4	3.7	0.2
200	1.4	0.4	0.8	10.4	4.5	4.5	0.0	0.0	0.2	0.1	1.7	13.4	18.4	17.9	2.4	0.1
250	1.4	0.3	1.0	9.5	4.5	3.7	0.0	0.0	0.2	0.0	1.1	9.9	13.7	14.4	1.5	0.0
300	1.3	0.3	0.9	9.3	4.4	3.4	0.0	0.0	0.1	0.0	0.6	8.9	11.8	12.3	0.8	0.0
350	1.3	0.3	0.6	8.1	4.4	2.3	0.0	0.0	0.1	0.0	0.5	5.8	11.7	8.6	0.7	0.0
400	1.3	0.2	0.4	7.9	4.4	2.3	0.0	0.0	0.1	0.0	0.3	4.5	11.1	6.6	0.4	0.0
450	1.3	0.1	0.4	7.8	4.4	2.3	0.0	0.0	0.1	0.0	0.3	3.7	10.9	5.6	0.4	0.0
500	0.8	0.1	0.1	6.2	4.4	2.0	0.0	0.0	0.1	0.0	0.1	3.2	10.0	4.6	0.1	0.0
550	0.3	0.1	0.1	3.4	4.4	0.6	0.0	0.0	0.1	0.0	0.1	0.9	8.4	1.8	0.1	0.0
600	0.1	0.1	0.1	3.4	4.4	0.6	0.0	0.0	0.1	0.0	0.1	0.9	8.3	1.7	0.1	0.0
650	0.1	0.1	0.1	3.4	4.4	0.6	0.0	0.0	0.1	0.0	0.1	0.8	7.7	1.5	0.1	0.0
700	0.0	0.1	0.1	3.3	4.4	0.6	0.0	0.0	0.0	0.0	0.1	0.8	6.1	1.3	0.1	0.0
750	0.0	0.1	0.0	3.3	4.4	0.6	0.0	0.0	0.0	0.0	0.0	0.8	6.1	1.3	0.0	0.0
800	0.0	0.1	0.0	3.3	4.4	0.6	0.0	0.0	0.0	0.0	0.0	0.7	6.0	1.3	0.0	0.0
850	0.0	0.1	0.0	3.3	4.4	0.6	0.0	0.0	0.0	0.0	0.0	0.7	5.9	1.3	0.0	0.0
900	0.0	0.1	0.0	3.3	4.4	0.6	0.0	0.0	0.0	0.0	0.0	0.7	5.9	1.3	0.0	0.0
950	0.0	0.0	0.0	3.3	2.7	0.6	0.0	0.0	0.0	0.0	0.0	0.7	3.8	1.3	0.0	0.0
1000	0.0	0.0	0.0	3.3	2.2	0.6	0.0	0.0	0.0	0.0	0.0	0.7	3.1	1.3	0.0	0.0

Value in red indicates the highest value.

Table B-2
Fox 3 (Options 1 and 2) – Wet Mechanical Draft (WMD) Cooling Tower
Average Annual Plume Fogging Hours

Distance (M)	Direction Plume is Headed															
	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
50	0.0	0.0	0.0	0.0	0.4	0.6	0.4	0.0	0.0	0.0	0.0	0.0	2.8	4.4	2.8	0.0
100	0.1	1.4	0.1	0.4	3.9	1.7	2.2	0.4	0.0	0.2	0.1	5.6	22.2	14.5	8.4	0.9
150	1.4	2.7	0.3	0.0	2.6	1.4	1.6	0.5	0.1	0.8	0.8	6.9	19.8	14.4	5.8	1.2
200	2.2	2.6	0.7	0.2	2.5	1.3	1.3	0.5	0.1	1.0	1.7	5.2	18.3	12.4	4.3	1.3
250	2.3	2.0	0.8	0.2	2.3	1.3	1.0	0.3	0.1	0.8	1.4	3.6	15.2	10.4	2.4	0.8
300	2.3	1.3	0.8	0.2	2.2	1.3	0.9	0.2	0.1	0.6	1.4	2.1	13.7	8.7	1.7	0.6
350	2.0	1.3	0.5	0.2	2.2	1.3	0.9	0.1	0.1	0.5	1.1	1.6	12.9	7.7	1.5	0.4
400	1.1	1.3	0.4	0.2	2.2	1.3	0.9	0.1	0.0	0.4	0.6	1.4	10.0	7.0	1.4	0.3
450	1.0	1.2	0.4	0.1	0.5	0.6	0.4	0.1	0.0	0.2	0.5	1.2	5.1	4.4	0.4	0.2
500	1.0	1.1	0.4	0.0	0.0	0.6	0.3	0.0	0.0	0.2	0.5	0.9	3.4	3.3	0.1	0.1
550	1.0	0.3	0.4	0.0	0.0	0.6	0.2	0.0	0.0	0.1	0.5	0.9	3.3	3.2	0.1	0.1
600	1.0	0.0	0.4	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.5	0.9	1.4	2.8	0.1	0.1
650	1.0	0.0	0.4	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.5	0.9	0.8	2.7	0.1	0.1
700	0.6	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.6	0.8	2.7	0.1	0.1
750	0.6	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.5	0.8	2.7	0.1	0.0
800	0.6	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.5	0.8	1.8	0.1	0.0
850	0.6	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.5	0.8	1.4	0.1	0.0
900	0.6	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.5	0.7	1.3	0.1	0.0
950	0.5	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.4	0.2	1.3	0.1	0.0
1000	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.1	0.0

Value in red indicates the highest value.

**Table B-3
Fox 1&2 – Wet Mechanical Draft (WMD) Cooling Tower
Average Annual Plume Rime Ice Hours**

Distance (M)	Direction Plume is Headed															
	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
50	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100	1.6	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1	7.3	8.2	8.2	1.4	0.1
150	1.1	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.9	10.6	11.7	12.4	1.5	0.0
200	1.0	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.4	6.9	11.3	8.7	0.8	0.0
250	1.0	0.3	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.9	7.4	6.6	0.6	0.0
300	1.0	0.3	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	4.6	5.7	6.3	0.2	0.0
350	0.9	0.3	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.2	5.5	4.6	0.1	0.0
400	0.9	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	5.0	2.6	0.0	0.0
450	0.9	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	4.8	1.7	0.0	0.0
500	0.4	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.0	1.2	0.0	0.0
550	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.4	0.3	0.0	0.0
600	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.4	0.2	0.0	0.0
650	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8	0.0	0.0	0.0
700	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0
750	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0
800	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0
850	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0
900	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0
950	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0

Value in red indicates the highest value.

Table B-4
Fox 3 (Options 1 and 2) – Wet Mechanical Draft (WMD) Cooling Tower
Average Annual Plume Rime Ice Hours

Distance (M)	Direction Plume is Headed															
	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.9	1.2	0.0
100	0.1	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.6	8.5	6.0	2.4	0.0
150	1.1	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	3.8	8.7	6.8	1.6	0.1
200	1.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	2.8	9.0	5.6	1.3	0.1
250	1.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	2.5	8.2	5.1	0.6	0.1
300	1.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.3	7.9	3.9	0.3	0.1
350	1.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.2	7.9	3.9	0.3	0.1
400	0.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.1	5.5	3.2	0.3	0.1
450	0.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.9	4.1	2.3	0.1	0.1
500	0.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.6	3.0	1.9	0.0	0.1
550	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	3.0	1.9	0.0	0.1
600	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.2	1.6	0.0	0.1
650	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	1.4	0.0	0.1
700	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	1.4	0.0	0.1
750	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	1.4	0.0	0.0
800	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.6	0.0	0.0
850	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.2	0.0	0.0
900	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0
950	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Value in red indicates the highest value.

Table B-5
Fox 1&2 – Wet Mechanical Draft (WMD) Cooling Tower
Average Annual Elevated Visible Plume Hours

Distance (M)	Direction Plume is Headed															
	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
200	365	356	363	415	405	386	378	424	496	612	703	765	749	721	588	469
400	30	44	105	153	167	130	138	140	138	186	303	361	305	181	71	31
600	16	25	54	85	92	74	84	75	70	91	141	228	155	68	27	19
800	12	19	37	61	64	50	59	50	48	59	80	154	100	37	18	14
1000	11	18	30	47	51	39	45	40	36	45	58	112	70	27	15	13
1200	10	16	25	37	40	30	34	32	29	36	48	86	54	22	13	11
1400	9	15	23	33	36	25	28	29	25	31	40	68	44	20	12	9
1600	8	14	21	28	31	22	24	25	22	27	36	57	38	17	10	8
1800	7	13	19	25	28	20	20	23	20	24	32	48	35	15	9	7
2000	6	12	16	21	27	19	18	22	18	22	28	40	29	12	6	5
2200	4	10	14	19	24	17	16	20	17	20	25	36	26	10	5	4
2400	3	8	12	16	22	15	14	19	15	18	21	31	23	8	4	3
2600	1	5	9	14	20	14	13	18	14	17	18	27	19	6	2	2
2800	1	3	7	11	18	12	12	17	14	15	16	21	15	3	1	1
3000	0	1	5	9	16	11	10	16	12	13	13	17	12	2	1	1
3200	0	1	4	6	14	10	9	15	10	10	11	13	7	2	1	0
3400	0	0	4	5	11	9	7	14	9	8	8	10	5	1	1	0
3600	0	0	3	4	11	8	6	12	7	7	6	8	4	1	1	0
3800	0	0	2	3	9	7	5	10	7	5	5	6	3	1	1	0
4000	0	0	2	2	8	6	5	9	5	4	5	6	2	1	1	0

Value in red indicates the highest value.

Table B-6
Fox 3 (Options 1 and 2) – Wet Mechanical Draft (WMD) Cooling Tower
Average Annual Elevated Visible Plume Hours

Distance (M)	Direction Plume is Headed															
	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
200	137	155	196	318	351	341	321	346	347	415	540	650	670	520	288	164
400	41	50	82	126	124	109	121	105	104	114	161	259	237	161	55	40
600	21	27	46	73	72	61	67	65	62	66	87	147	142	74	27	19
800	15	18	33	45	50	38	41	45	44	47	61	98	90	44	17	15
1000	12	15	24	33	37	28	31	35	33	35	48	69	63	29	14	12
1200	11	14	21	27	30	23	25	27	25	28	40	58	47	22	13	11
1400	9	13	19	24	27	19	21	22	21	25	34	51	36	20	11	9
1600	8	12	18	21	24	16	18	19	18	23	30	45	30	18	9	8
1800	7	12	17	19	22	14	15	17	18	21	28	41	25	15	9	7
2000	6	10	14	18	20	13	13	16	16	20	25	37	22	14	7	5
2200	5	8	12	15	19	11	13	15	15	18	24	34	19	10	5	5
2400	3	6	10	13	17	10	12	14	14	17	22	31	16	8	4	3
2600	2	4	8	11	16	9	11	13	12	16	19	27	14	6	2	2
2800	1	2	5	9	14	8	10	12	12	14	15	23	11	3	1	0
3000	0	1	3	7	12	8	8	11	11	12	12	19	9	2	1	0
3200	0	1	2	6	11	6	7	10	10	10	10	14	6	1	1	0
3400	0	0	2	5	10	6	6	8	9	9	8	12	5	1	1	0
3600	0	0	2	4	9	5	4	7	8	7	7	8	4	0	1	0
3800	0	0	1	3	7	5	4	7	7	5	6	6	3	0	1	0
4000	0	0	1	2	6	4	3	5	5	4	5	6	2	0	0	0

Value in red indicates the highest value.

Table B-7
Fox 3 with 1&2 – Wet Mechanical Draft (WMD) Cooling Tower
Maximum 3-Month Average Mineral Deposition (10⁻⁴ milligrams/square centimeter/month)

Distance (M)	Direction Plume is Headed															
	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
100	3.23	1.47	0.23	0.02	0.05	0.03	0.30	1.23	3.51	2.19	0.50	0.04	4.84	0.03	0.36	1.24
200	4.07	2.09	0.49	0.28	5.58	0.30	0.66	1.77	4.45	3.24	1.15	0.68	36.52	0.89	0.70	1.65
300	2.23	1.81	0.61	0.59	2.28	0.56	0.83	1.52	2.66	2.89	1.59	1.31	34.79	1.65	0.89	1.41
400	1.63	1.41	0.74	0.74	0.84	0.77	1.01	1.20	1.93	2.11	1.97	1.49	2.01	1.62	1.11	1.11
500	0.69	0.83	0.71	0.72	0.64	0.73	0.94	0.70	0.87	1.25	1.74	1.44	1.55	1.58	1.02	0.69
600	0.14	0.13	0.33	0.48	0.64	0.39	0.38	0.10	0.16	0.28	0.68	0.91	1.55	1.01	0.41	0.10
700	0.14	0.12	0.08	0.20	0.64	0.14	0.09	0.10	0.16	0.28	0.21	0.44	1.55	0.56	0.10	0.10
800	0.14	0.12	0.07	0.12	0.64	0.07	0.07	0.10	0.16	0.27	0.19	0.27	1.55	0.41	0.09	0.09
900	0.14	0.12	0.07	0.12	0.46	0.06	0.07	0.10	0.16	0.26	0.19	0.25	1.18	0.40	0.09	0.09
1000	0.14	0.12	0.07	0.11	0.27	0.06	0.07	0.10	0.16	0.26	0.19	0.22	0.79	0.35	0.09	0.09
1100	0.14	0.12	0.07	0.07	0.24	0.04	0.07	0.10	0.16	0.26	0.19	0.08	0.72	0.09	0.09	0.09
1200	0.14	0.12	0.07	0.07	0.13	0.04	0.07	0.10	0.16	0.26	0.19	0.08	0.44	0.09	0.09	0.09
1300	0.14	0.12	0.07	0.07	0.04	0.04	0.07	0.10	0.16	0.26	0.19	0.08	0.22	0.09	0.09	0.09
1400	0.14	0.12	0.07	0.07	0.03	0.04	0.07	0.10	0.16	0.26	0.19	0.08	0.18	0.09	0.09	0.09
1500	0.12	0.11	0.07	0.06	0.03	0.04	0.07	0.08	0.12	0.21	0.19	0.08	0.17	0.09	0.09	0.08
1600	0.11	0.09	0.06	0.06	0.03	0.04	0.06	0.05	0.09	0.09	0.11	0.08	0.17	0.08	0.07	0.06
1700	0.11	0.09	0.05	0.06	0.03	0.04	0.05	0.05	0.09	0.09	0.08	0.08	0.17	0.08	0.06	0.06
1800	0.11	0.09	0.05	0.06	0.03	0.04	0.05	0.05	0.09	0.09	0.08	0.08	0.17	0.08	0.06	0.06
1900	0.11	0.09	0.05	0.06	0.02	0.04	0.05	0.05	0.09	0.09	0.08	0.08	0.17	0.08	0.06	0.06
2000	0.11	0.09	0.05	0.06	0.02	0.04	0.05	0.05	0.09	0.09	0.08	0.08	0.17	0.08	0.06	0.06

Value in red indicates the highest value (and occurred during the summer quarter).

Table B-8
Fox 3 (Options 1 and 2) – Wet Mechanical Draft (WMD) Cooling Tower
Maximum 3-Month Average Mineral Deposition (10⁻⁴ milligrams/square centimeter/month)

Distance (M)	Direction Plume is Headed															
	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
100	6.84	6.51	3.04	0.91	0.29	6.66	0.35	1.59	7.06	8.80	6.51	2.55	0.84	16.05	0.40	1.68
200	9.74	7.76	4.88	3.45	3.62	10.13	4.73	4.63	10.92	11.91	10.36	7.45	13.11	26.36	4.80	4.39
300	5.55	3.56	2.95	3.05	3.94	4.58	4.14	3.72	6.62	6.27	6.57	5.92	12.71	13.15	4.59	3.72
400	3.12	2.38	1.59	1.58	1.98	3.79	2.35	2.10	3.87	4.44	3.91	3.32	6.32	7.90	2.43	2.18
500	1.59	1.48	0.87	1.14	1.31	2.77	1.63	1.34	2.05	3.20	2.31	2.16	4.21	5.00	1.56	1.14
600	1.59	1.48	0.87	1.11	1.31	0.82	1.59	1.34	2.05	3.22	2.33	2.10	4.19	2.15	1.56	1.09
700	1.56	1.48	0.86	1.09	1.26	0.25	1.41	1.34	1.95	3.22	2.10	2.10	3.86	0.94	1.43	1.09
800	1.54	1.19	0.86	0.97	1.04	0.13	0.74	1.12	1.95	1.88	2.06	1.78	2.53	0.59	0.87	0.94
900	1.29	1.06	0.67	0.70	1.04	0.10	0.74	0.67	1.41	1.16	1.32	1.09	2.53	0.52	0.87	0.65
1000	1.17	1.06	0.59	0.70	1.04	0.02	0.74	0.67	1.14	1.16	0.97	1.09	2.53	0.44	0.87	0.65
1100	1.14	1.06	0.57	0.70	0.72	0.02	0.50	0.67	1.11	1.14	0.94	1.09	1.76	0.44	0.59	0.65
1200	0.55	0.45	0.29	0.40	0.07	0.02	0.05	0.40	0.52	0.52	0.47	0.65	0.39	0.44	0.05	0.37
1300	0.07	0.07	0.03	0.05	0.05	0.02	0.03	0.05	0.05	0.08	0.07	0.10	0.32	0.44	0.03	0.03
1400	0.07	0.07	0.03	0.02	0.03	0.02	0.02	0.02	0.05	0.08	0.07	0.05	0.29	0.44	0.03	0.02
1500	0.03	0.05	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.05	0.03	0.03	0.29	0.44	0.03	0.02
1600	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.25	0.44	0.03	0.02
1700	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.25	0.44	0.03	0.00
1800	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.25	0.27	0.03	0.00
1900	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.25	0.03	0.03	0.00
2000	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.25	0.03	0.03	0.00

Value in red indicates the highest value.

**Table B-9
Plume Categories as Defined by SACTI PREP**

Plume Category	Type	Wind Speed	Dry Bulb	Dew Point	Plume Temperature	Mixing Height	Frequency
		(m)	(K)	(K)	(K)	(meters)	(%)
1	FOG	10	263.1	262.6	293.1	500	0.1%
2	FOG	15	263.1	262.6	293.1	500	0.0%
3	FOG	12	263.1	261.1	293	500	0.2%
4	FOG	17	263.1	261.1	293	500	0.1%
5	FOG	15	263.1	258.6	292.8	500	0.1%
6	FOG	12.5	273.1	272.4	297.2	500	0.7%
7	FOG	16.5	273.1	269.4	296.7	500	0.1%
8	FOG	15	283.1	282.4	301.6	500	0.0%
9	FOG	16.5	283.1	279.4	300.9	500	0.1%
10	FOG	15.5	293.1	291.1	306.2	500	0.0%
11	PLUME	2.5	295.2	285.8	304.9	1404	3.6%
12	PLUME	2.7	295.9	285.7	305	1482	3.3%
13	PLUME	1.9	294.8	284.3	304.4	1456	2.7%
14	PLUME	5.5	295.8	284.5	304.6	1453	9.0%
15	PLUME	4.3	297.4	285.7	305.3	1482	0.0%
16	PLUME	10.5	290	279.8	302.4	1268	0.0%
17	PLUME	9.8	293.3	281.1	303.3	1392	1.7%
18	PLUME	3.2	289.9	282.9	303.1	1262	2.9%
19	PLUME	3.4	288.5	281.5	302.5	1263	3.0%
20	PLUME	3.2	288.4	282.4	302.7	1189	2.8%
21	PLUME	3.8	286.6	280.2	301.8	1196	3.2%
22	PLUME	3.2	284.5	278.3	301	1140	2.6%
23	PLUME	3.7	285.4	280.2	301.5	1154	2.9%
24	PLUME	3.6	284.5	279.4	301.2	1150	2.9%
25	PLUME	3.6	281.5	276.3	299.9	1132	3.0%
26	PLUME	3.5	280.3	275.4	299.4	1087	3.0%
27	PLUME	3.9	281.1	276.7	299.9	1096	2.7%
28	PLUME	3.6	279.4	275.2	299.2	1077	2.9%
29	PLUME	3.8	278.6	274.4	298.8	1042	2.9%
30	PLUME	3.9	277.6	273.6	298.5	1048	2.8%
31	PLUME	3.9	277	273.2	298.3	1034	2.9%
32	PLUME	4.1	276	272.2	297.9	1015	2.9%
33	PLUME	4.1	274.6	271.2	297.4	958	2.9%
34	PLUME	4.3	273.3	269.8	296.8	953	3.0%
35	PLUME	4.2	272.7	269.4	296.6	923	2.8%
36	PLUME	4.2	271.5	268.4	296.1	876	3.1%
37	PLUME	4.5	270.3	267.5	295.7	861	2.8%
38	PLUME	4.4	270.3	267.7	295.7	875	3.0%
39	PLUME	4.5	268.8	266.2	295.1	822	2.6%
40	PLUME	4.7	268.1	265.8	294.9	797	3.0%
41	PLUME	2.9	273.8	273.3	297.5	844	4.9%
42	PLUME	2.5	269.8	269	295.8	789	0.9%
43	PLUME	5.3	269.7	268.5	295.7	892	6.3%
44	PLUME	3.8	267.5	266.4	294.8	548	0.0%
45	PLUME	9.4	268.3	266.7	295.1	930	1.2%

APPENDIX R WISDOT AND FAA DOCUMENTATION

WISDOT

From: [Hetland, Justin - DOT](#)
To: [Barton, Tim](#)
Cc: [Robert Leigh PE \(rleigh@integrysgroup.com\)](mailto:rleigh@integrysgroup.com); 76622
Subject: RE: Tall Structures Permit Application
Date: Friday, December 19, 2014 8:21:21 AM
Attachments: [image001.png](#)

Good Morning Tim,

Thank you for the permit applications. It appears however, that these structures will not require tall structure permits from the Bureau of Aeronautics. They are not close enough to a public use airport, nor do they exceed 500' above the lowest point within one mile of their greatest height. Please let me know if you have any further questions.

Happy Holidays!

Justin M Hetland

Airspace Safety Manager/Assistant Chief Flight Instructor
Department of Transportation/DTIM/Aeronautics
4802 Sheboygan Ave Room 701
Madison, WI 53707
608-267-5018 | justin.hetland@dot.wi.gov



From: Barton, Tim [<mailto:tbarton@burnsmcd.com>]
Sent: Thursday, December 18, 2014 2:34 PM
To: Hetland, Justin - DOT
Cc: Robert Leigh PE (rleigh@integrysgroup.com); 76622
Subject: RE: Tall Structures Permit Application

Justin,

It's been a few months since we last discussed the project and we have received a determination from the FAA on the stacks that were submitted for each of the two site options. The CPCN application is planned to be submitted to the PSCW in January 2015 and through that process, approval for one of the two site options to be constructed will occur during the PSCW process.

If you need anything further to process the applications, let me know.

Thanks,
-tim

Tim Barton
Sr. Environmental Specialist

Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114
Direct: 816-822-3911
Main: 816-333-9400
Mobile: 816-813-1463
Fax: 816-822-4299
tbarton@burnsmcd.com
www.burnsmcd.com

From: Hetland, Justin - DOT [<mailto:Justin.Hetland@dot.wi.gov>]
Sent: Wednesday, January 15, 2014 10:12 AM
To: Barton, Tim
Cc: Brummond, Scott - DOT; Rodefeld, Joseph - DOT
Subject: RE: Tall Structures Permit Application

Hi Tim,

It appears that the proposed power plant is a good distance away from Outagamie County Regional and Austin Straubel International, well outside their Height Limitation Zoning (HLZO). HLZOs extend out 3 miles from the airport boundary of public airports, and this proposal is well outside of that range.

I show only one private airport that we know about that is relatively close to this proposal, the Antique Aerodrome approximately 19,000 feet northeast. I've attached a link to our airport reference point file which opens with Google Earth. This file was developed to assist the Highway Department in planning when to contact airports if they have a project nearby. The blue shaded areas are 5 mile buffers around all public use airports, the orange are 2 mile buffers around private airports. Clicking anywhere in the colored areas will bring up a data set with information about the airport including contact info, here's the link: <http://www.dot.wisconsin.gov/travel/air/arp.htm> Click on the 'kmz' file and it will open to Google Earth. Anyhow this info may help you with this project or future projects!

Finally be sure to check the FAA's OE/AAA website to see if you'll need to file a notice of proposed construction, I'm sure you're familiar with that process.

As always let me know if you have any questions or need assistance!

Justin M Hetland

Airspace Safety Program Manager
Department of Transportation/DTIM/Aeronautics
4802 Sheboygan Ave Room 701
Madison, WI 53707
608-267-5018 | justin.hetland@dot.wi.gov



HIGH STRUCTURE PERMIT APPLICATION

AE12 1095
s. 114.135, Wis. Statutes, Wis. Adm. Code Trans 56



Application for a High Structure Permit from the *Wisconsin Bureau of Aeronautics* to construct a high structure is made in accordance with the information stated below:

1. Applicant Name Bob Leigh	Applicant Address 700 North Adams Street Green Bay, WI 54301
2. Owner of Structure Upon Completion Integrays Business Support, LLC Bob Leigh	Owner Address 700 North Adams Street Green Bay, WI 54301
3. Location of Proposed Structure (NAD 83 <input checked="" type="checkbox"/> or, NAD 27 <input type="checkbox"/> datum) North Latitude <u>44</u> ° <u>19</u> ' <u>28.90</u> " Structure: Fox 3 - Stack Site Option 1 West Longitude <u>88</u> ° <u>12</u> ' <u>20.37</u> " FAA ASN: 2014-AGL-13216-OE <u>SW</u> 1/4 of the <u>NW</u> 1/4 of Section <u>4</u> Town <u>21N</u> N Range <u>19E</u> E/W County of <u>Outagamie</u>	
4. Maximum Height of Structure Above Ground Level (AGL) Including Appurtenances is <u>175</u> feet.	
5. Maximum Height of Structure Above Mean Sea Level (AMSL) <u>839</u> feet.	
6. Elevation of Ground at Structure's Base (Above Mean Sea Level) is <u>664</u> feet.	
7. Closest runway on the nearest Public-use Airport (airport name) <u>Antique Aerodome (private)</u> Direction <u>northeast</u> Distance (statute miles) <u>3.7</u>	
8. The structure will be marked or painted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
9. The structure will be lighted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With: <input type="checkbox"/> White strobes <input type="checkbox"/> Red incandescent <input type="checkbox"/> Medium/High Intensity <input type="checkbox"/> Dual SYSTEM	

Bob Leigh
Signature
Senior Project Engineer
Title

12-18-2014
Date

Please return completed application to: **Wisconsin Department of Transportation
Bureau of Aeronautics
4802 Sheboygan Avenue – Room 701
PO Box 7914
MADISON WI 53707-7914**

HIGH STRUCTURE PERMIT APPLICATION

AE12 1095
s. 114.135, Wis. Statutes, Wis. Adm. Code Trans 56



Application for a High Structure Permit from the *Wisconsin Bureau of Aeronautics* to construct a high structure is made in accordance with the information stated below:

1. Applicant Name Bob Leigh	Applicant Address 700 North Adams Street Green Bay, WI 54301
2. Owner of Structure Upon Completion Integrays Business Support, LLC Bob Leigh	Owner Address 700 North Adams Street Green Bay, WI 54301
3. Location of Proposed Structure (NAD 83 <input checked="" type="checkbox"/> or, NAD 27 <input type="checkbox"/> datum) North Latitude <u>44</u> ° <u>19</u> ' <u>17.42</u> " Structure: Fox 3 - Stack Site Option 2 West Longitude <u>88</u> ° <u>12</u> ' <u>13.18</u> " FAA ASN: 2014-AGL-13217-OE <u>SE</u> 1/4 of the <u>NW</u> 1/4 of Section <u>4</u> Town <u>21N</u> N Range <u>19E</u> E/W County of <u>Outagamie</u>	
4. Maximum Height of Structure Above Ground Level (AGL) Including Appurtenances is <u>175</u> feet.	
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8. The structure will be marked or painted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
9. The structure will be lighted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With: <input type="checkbox"/> White strobes <input type="checkbox"/> Red incandescent <input type="checkbox"/> Medium/High Intensity <input type="checkbox"/> Dual SYSTEM	

Bob Leigh
Signature
Senior Project Engineer
Title

12-18-2014
Date

Please return completed application to: **Wisconsin Department of Transportation
Bureau of Aeronautics
4802 Sheboygan Avenue – Room 701
PO Box 7914
MADISON WI 53707-7914**

FAA



Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 2601 Meacham Boulevard
 Fort Worth, TX 76193

Aeronautical Study No.
 2014-AGL-13216-OE

Issued Date: 12/05/2014

Integrays Business Support, LLC
 Bob Leigh
 700 North Adams Street
 Green Bay, WI 54301

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Stack Fox 3 - Stack Site Option 1
 Location: Village of Wrightstown, WI
 Latitude: 44-19-28.90N NAD 83
 Longitude: 88-12-20.37W
 Heights: 664 feet site elevation (SE)
 175 feet above ground level (AGL)
 839 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part 1)
- Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 06/05/2016 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (847) 294-7575. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2014-AGL-13216-OE.

Signature Control No: 233725675-236291728

Vivian Vilaro
Specialist

(DNE)



Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 2601 Meacham Boulevard
 Fort Worth, TX 76193

Aeronautical Study No.
 2014-AGL-13217-OE

Issued Date: 12/05/2014

Integrays Business Support, LLC
 Bob Leigh
 700 North Adams Street
 Green Bay, WI 54301

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Stack Fox 3 - Stack Site Option 2
 Location: Village of Wrightstown, WI
 Latitude: 44-19-17.42N NAD 83
 Longitude: 88-12-13.18W
 Heights: 664 feet site elevation (SE)
 175 feet above ground level (AGL)
 839 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

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Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

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- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

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If we can be of further assistance, please contact our office at (847) 294-7575. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2014-AGL-13217-OE.

Signature Control No: 233725676-236291727

Vivian Vilaro
Specialist

(DNE)