

# FINAL REPORT

For Industrial Hygiene Monitoring During Virkon™  
Use and Mixing at the Peshtigo Service Center

## WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Ms. M. Present, Safety Manager

June 13, 2014

Project No. 193700658





**Stantec**

**Stantec Consulting Services Inc.**  
12075 Corporate Parkway  
Mequon, WI 53092  
Tel: (262) 241-4466  
Fax: (262) 241-4901

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June 12, 2014

Ms. Marsha Present  
DNR Safety Manager  
Wisconsin Department of Natural Resources  
101 N Ogden Road, Suite A  
Peshtigo, WI 54157

**RE: Final Report – Industrial Hygiene Monitoring During Virkon Mixing, Wisconsin DNR,  
Peshtigo, WI  
Stantec Project Number: 193700658**

Dear Ms. Present:

Wisconsin Department of Natural Resources (WDNR) retained Stantec Consulting Services Inc. (Stantec) to perform employee breathing zone air monitoring during Dupont Virkon™ Aquatic (Virkon) mixing at the facility located at 101 Ogden Road, in Peshtigo, WI (the Facility). The site contact was Ms. Marsha Present, WDNR Safety Manager, and the monitoring was conducted on May 28, 2014 by Stantec's Senior Scientist, Mr. Rick Pager.

The intent of the air monitoring was to evaluate compliance with the Wisconsin Department of Safety and Professional Services (SPS) permissible exposure limits (PELs), as adopted from the federal Occupational Safety and Health Administration (OSHA), as well as the American Conference of Governmental Industrial Hygienists' (ACGIH) advisory threshold limit values (TLVs) established for the specific agents, as well as recommending control measures, including personal protective equipment, based on the results.

## **SUMMARY AND FINDINGS**

The results for Sulfamic Acid (measured as total dust as the marker or surrogate) and Potassium Peroxymonosulfate (measured as Potassium as the surrogate) showed concentrations below the analytical limits for both compounds. Thus, no remedial or corrective actions are required for the inhalation potential. However, it was noted that the employees wore no special eye protection while mixing the Virkon. Based on the significant eye and face hazard that this agent poses in the concentrated state, it should be considered mandatory that safety glasses and either a full faceshield or chemical goggles be worn whenever handling this product in an open container, along with nitrile gloves. Additionally, an emergency eyewash should be readily available during mixing activities, and when using this product.

## **SAMPLING STRATEGY**

Both the sulfamic acid and potassium samples were collected utilizing Sensidyne GilAir5 personal sampling pumps and drawing air through a 37 mm, match-weighed, mixed cellulose ester (MCE) filters enclosed in a three-piece polycarbonate cassette at a rate of

**RE: Final Report –Industrial Hygiene Monitoring During Virkon Mixing, Wisconsin DNR Peshtigo, WI**

approximately 2.0 liters per minute. The pumps were calibrated prior to and after sampling utilizing a BIOS Defender 510-M primary flow calibrator.

The air samples were sent to, and analyzed, by Galson Laboratories, East Syracuse, New York, which is certified by the American Industrial Hygiene Association (AIHA). National Institute of Occupational Safety and Health (NIOSH) Methods were utilized for analysis including field blanks.

## **DISCUSSION**

The DNR utilizes the Virkon as a disinfectant on boats and equipment after they have been removed from a waterway. The product is also used as a boot wash at State fish hatcheries to disinfect shoes prior to entering operational areas. The Virkon product is a powder, packaged in a plastic-lined tub, and mixed with water prior to use. The powder is mixed at a concentration of approximately a 100 milliliters (ml) per gallon of water for disinfection of a boat, and at 200 ml/gallon as a boot wash in the fish hatcheries.

In regard to the mixing activities, Mr. Ron Rhode, wearing a rain jacket and nitrile gloves, used a small scoop to fill a measuring cup to the proper volume of product. The measured powder was poured into a sprayer, water was added, and then the sprayer was pressurized by hand pumping. As a second operation, Mr. Rhode used the scoop to fill the measuring cup to the proper level, poured the powder into a tub, and added water to the tub to the proper level, and sloshed the tub back and forth to mix the product to simulate the operations at the hatcheries.

Mr. Brad Ryan, wearing waders, rain jacket and nitrile gloves used the measuring cup to scoop the appropriate volume of product, poured it into the sprayer, and added water. The sprayer was pressurized and a boat was sprayed over the entire exterior and interior. The spraying operation did not saturate the boat as to cause runoff from the spraying. Mr. Ryan then placed a set of waders on the boat and sprayed them to simulate the disinfection process.

It was stated that once a solution of Virkon is mixed, it stays in the sprayer and is used until it is consumed. Then a new batch is mixed for use. The spraying may occur at a boat launch if the boat will be taken to another water body. As an alternative, the boat can be brought back to the Facility for disinfection.

## **CONCLUSIONS & RECOMMENDATIONS**

Based on the test results, the conditions on the day of the testing, and on the authorized scope of this project, the following recommendations and conclusions are provided for DNR's consideration:

- It is concluded that the airborne concentrations of Virkon are minimal and well below any applicable regulatory limits;

**RE: Final Report –Industrial Hygiene Monitoring During Virkon Mixing, Wisconsin DNR  
Peshtigo, WI**

- It is recommended that the employees always wear nitrile gloves, chemical splash goggles and/or face shield while mixing the Virkon product, and that an emergency eyewash is readily available in the immediate area of use; and
- It is recommended that the monitoring results from this survey be shared with the respective employees.

Stantec appreciates the opportunity to provide these services to the Wisconsin DNR. Please feel free to contact me at 262-643-9156 or Dan Feldt at 262-643-9176 if you have any questions.

Sincerely,

**STANTEC CONSULTING SERVICES INC.**



Richard Payer  
Sr. Scientist



Daniel G. Feldt, MPH, CIH  
Senior Industrial Hygienist

Attachments

Table 1 – Air Monitoring Results  
Galson Laboratory Results

#### **LIMITATIONS**

The contents of this report reflect conditions and controls that Stantec was retained specifically to identify with at the time of the survey only, and may not reflect all conditions or potential exposures at this facility with regard to occupational safety and industrial hygiene. Stantec completed this industrial hygiene study in accordance with the degree of care and technical skill appropriately exercised by professionals currently practicing in this area. Conclusions contained in this report represent professional judgment and are based upon available information and technically accepted industrial hygiene and environmental health practices at the present time and location. Other than this, no warranty is implied or expressed.

**Table 1**  
**Air Monitoring Results**  
Wisconsin Department of Natural Resources  
101 N Ogden Road, Suite A  
Peshtigo, WI 54157  
May 28, 2014

SAMPLE #/ID	NAME*	Activity	CHEMICAL	DURATION (MINS.)	ANALYTICAL RESULTS	8 HR. TWA	WDSPS PEL	ACGIH TLV
D 101	Brad Ryan	mixing /disinfection	Sulfamic Acid (as total dust) Potassium Peroxymonosulfate (as Potassium)	480***	<0.42 mg/m <sup>3</sup>	<0.001 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
					<0.031 mg/m <sup>3</sup>	<0.0008 mg/m <sup>3</sup>	ND	0.1^ mg/m <sup>3</sup>
D 102	Ron Rhode	mixing	Sulfamic Acid (as total dust) Potassium Peroxymonosulfate (as Potassium)	480***	<0.42 mg/m <sup>3</sup>	<0.0096 mg/m <sup>3</sup>	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
					<0.031 mg/m <sup>3</sup>	<0.0007 mg/m <sup>3</sup>	ND	0.1^ mg/m <sup>3</sup>
D 105	Field Blank		Sulfamic acid (as total dust) Potassium Peroxymonosulfate (as Potassium)		<0.20 mg			
					<15 ug			

**Analytical Laboratory:** Galson Laboratory - East Syracuse, New York. AIHA Certified  
**Analytical Methods:** Total Dust mod. NIOSH 0500, Gravimetric; Potassium mod. NIOSH 7300/mod. OSHA ID-125G, IPC/I  
**Sampling Equipment:** Sensidyne GilAir 5 Sampling Pumps; BIOS Defender Primary Standard Calibrator  
**WDSPS:** Wisconsin Department of Safety and Professional Services  
**ACGIH:** American Conference of Governmental Industrial Hygienists  
**PEL:** Permissible exposure limit/8 hr. time-weighted average  
**TLV:** ACGIH Threshold Limit Value/8 hr. time-weighted average  
**mg/m<sup>3</sup>:** milligrams per cubic meter of air

**Table 1**  
**Air Monitoring Results**

Wisconsin Department of Natural Resources  
101 N Ogden Road, Suite A  
Peshtigo, WI 54157  
May 28, 2014

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*:	Employees and areas selected by WDNR
<:	Less Than. The analyte was detected but at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.
<b>ND</b>	None Determined
^	as Persulfate
***	Actual Sample time for B Ryan was 13 minutes, for R Rhode was 11 minutes



Ms. Sherry Garza  
Parker Services Inc  
1800 North Point Drive  
Stevens Point, WI 54481

June 05, 2014

DOH ELAP #11626  
AIHA-LAP #100324

Account# 21621

Login# L319759

Dear Ms. Garza:

Enclosed are the analytical results for the samples received by our laboratory on May 29, 2014. All test results meet the quality control requirements of AIHA-LAP and NELAC unless otherwise stated in this report. All samples on the chain of custody were received in good condition unless otherwise noted.

Results in this report are based on the sampling data provided by the client and refer only to the samples as they were received at the laboratory. Unless otherwise requested, all samples will be discarded 14 days from the date of this report, with the exception of IOMs, which will be cleaned and disposed of after seven calendar days.

Current Scopes of Accreditation can be viewed at [www.galsonlabs.com](http://www.galsonlabs.com) in the accreditations section under the "about Galson" tab.

Please contact Patty Gregorich at (888)-432-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

Mary G. Unangst  
Laboratory Director

Enclosure(s)



LABORATORY ANALYSIS REPORT

6601 Kirkville Road  
East Syracuse, NY 13057  
(315) 432-5227  
FAX: (315) 437-0571  
www.galsonlabs.com

Client : Parker Services, Inc  
Site : DNR Peshtigo  
Project No. : 19370658 Virkon Sampling

Date Sampled : 28-MAY-14  
Date Received : 29-MAY-14  
Date Analyzed : 02-JUN-14  
Report ID : 834684

Account No.: 21621  
Login No. : L319759

---

Client ID : D 101                      Lab ID : L319759-1                      Air Volume : 480 Liter  
Date Sampled : 05/28/14                      Date Analyzed : 06/02/14

<u>Parameter</u>	<u>LOQ</u> <u>ug</u>	<u>Total</u> <u>ug</u>	<u>Conc</u>	<u>Units</u>
Potassium	15.	<15	<0.031	mg/m3

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

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Collection Media : Filter                      Submitted by: mlh/kml  
Approved by : keg  
Date : 03-JUN-14    NYS DOH # : 11626  
QC by: Tony D'Amico

---

< -Less Than                      mg -Milligrams                      m3 -Cubic Meters                      kg -Kilograms  
> -Greater Than                      ug -Micrograms                      l -Liters                      NS -Not Specified  
NA -Not Applicable                      ND -Not Detected                      ppm -Parts per Million                      LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.





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 Project No. : 19370658 Virkon Sampling  
 Date Sampled : 28-MAY-14  
 Date Received : 29-MAY-14  
 Date Analyzed : 02-JUN-14  
 Report ID : 834684  
 Account No.: 21621  
 Login No. : L319759

Client ID : D 102                      Lab ID : L319759-2                      Air Volume : 480 Liter  
 Date Sampled : 05/28/14                      Date Analyzed : 06/02/14

<u>Parameter</u>	<u>LOQ</u> ug	<u>Total</u> ug	<u>Conc</u>	<u>Units</u>
Potassium	15.	<15	<0.031	mg/m3

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

Collection Media : Filter  
 Submitted by: mlh/kml  
 Approved by : keg  
 Date : 03-JUN-14 NYS DOH # : 11626  
 QC by: Tony D'Amico

< -Less Than                      mg -Milligrams                      m3 -Cubic Meters                      kg -Kilograms  
 > -Greater Than                      ug -Micrograms                      l -Liters                      NS -Not Specified  
 NA -Not Applicable                      ND -Not Detected                      ppm -Parts per Million                      LOQ-Limit of Quantitation

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Client : Parker Services, Inc  
Site : DNR Peshtigo  
Project No. : 19370658 Virkon Sampling  
Date Sampled : 28-MAY-14  
Date Received : 29-MAY-14  
Date Analyzed : 02-JUN-14  
Report ID : 834684  
Account No.: 21621  
Login No. : L319759

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Client ID : D 105                      Lab ID : L319759-3                      Air Volume : NA  
Date Sampled : 05/28/14              Date Analyzed : 06/02/14

<u>Parameter</u>	<u>LOQ</u> <u>ug</u>	<u>Total</u> <u>ug</u>	<u>Conc</u>	<u>Units</u>
Potassium	15.	<15	NA	mg/m3

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

---

Collection Media : Filter                      Submitted by: mlh/kml  
Approved by : keg  
Date : 03-JUN-14    NYS DOH # : 11626  
QC by: Tony D'Amico

---

< -Less Than                      mg -Milligrams                      m3 -Cubic Meters                      kg -Kilograms  
> -Greater Than                      ug -Micrograms                      l -Liters                      NS -Not Specified  
NA -Not Applicable                      ND -Not Detected                      ppm -Parts per Million                      LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.



LABORATORY ANALYSIS REPORT

6601 Kirkville Road East Syracuse, NY 13057 (315) 432-5227 FAX: (315) 437-0571 www.galsonlabs.com	Client : Parker Services, Inc Site : DNR Peshtigo Project No. : 19370658 Virkon Sampling Date Sampled : 28-MAY-14 Date Received : 29-MAY-14 Date Analyzed : 30-MAY-14 Report ID : 834005	Account No.: 21621 Login No. : L319759
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Client ID : D 101	Lab ID : L319759-1	Air Volume : 480 Liter
Date Sampled : 05/28/14	Date Analyzed : 05/30/14	

<u>Parameter</u>	<u>LOQ</u> <u>mg</u>	<u>Total</u> <u>mg</u>	<u>Conc</u> <u>mg/m3</u>
Total Dust	0.20	<0.20	<0.42

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

Collection Media : Filter	Submitted by: PAH
	Approved by : CRI
	Date : 30-MAY-14 NYS DOH # : 11626
	QC by: Tony D'Amico

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.



LABORATORY ANALYSIS REPORT

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www.galsonlabs.com

Client : Parker Services, Inc  
Site : DNR Peshtigo  
Project No. : 19370658 Virkon Sampling  
Date Sampled : 28-MAY-14  
Date Received : 29-MAY-14  
Date Analyzed : 30-MAY-14  
Report ID : 834005  
Account No.: 21621  
Login No. : L319759

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Client ID : D 102                      Lab ID : L319759-2                      Air Volume : 480 Liter  
Date Sampled : 05/28/14                      Date Analyzed : 05/30/14

<u>Parameter</u>	<u>LOQ</u> mg	<u>Total</u> mg	<u>Conc</u> mg/m3
Total Dust	0.20	<0.20	<0.42

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

---

Collection Media : Filter  
Submitted by: PAH  
Approved by : CRI  
Date : 30-MAY-14 NYS DOH # : 11626  
QC by: Tony D'Amico

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< -Less Than                      mg -Milligrams                      m3 -Cubic Meters                      kg -Kilograms  
> -Greater Than                      ug -Micrograms                      l -Liters                      NS -Not Specified  
NA -Not Applicable                      ND -Not Detected                      ppm -Parts per Million                      LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.



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 Site : DNR Peshtigo  
 Project No. : 19370658 Virkon Sampling  
 Date Sampled : 28-MAY-14  
 Date Received : 29-MAY-14  
 Date Analyzed : 30-MAY-14  
 Report ID : 834005  
 Account No.: 21621  
 Login No. : L319759

Client ID : D 105                      Lab ID : L319759-3                      Air Volume : NA  
 Date Sampled : 05/28/14              Date Analyzed : 05/30/14

<u>Parameter</u>	<u>LOQ</u> <u>mg</u>	<u>Total</u> <u>mg</u>	<u>Conc</u> <u>mg/m3</u>
Total Dust	0.20	<0.20	NA

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

Collection Media : Filter  
 Submitted by: PAH  
 Approved by : CRI  
 Date : 30-MAY-14 NYS DOH # : 11626  
 QC by: Tony D'Amico

< -Less Than                      mg -Milligrams                      m3 -Cubic Meters                      kg -Kilograms  
 > -Greater Than                      ug -Micrograms                      l -Liters                      NS -Not Specified  
 NA -Not Applicable                      ND -Not Detected                      ppm -Parts per Million                      LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.



LABORATORY FOOTNOTE REPORT

6601 Kirkville Road  
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Client Name : Parker Services, Inc  
 Site : DNR Peshtigo  
 Project No. : 19370658 Virkon Sampling

Date Sampled : 28-MAY-14  
 Date Received: 29-MAY-14  
 Date Analyzed: 30-MAY-14 - 02-JUN-14

Account No.: 21621  
 Login No. : L319759

Unless otherwise noted below, all quality control results associated with the samples were within established control limits or did not impact reported results.

Unrounded results are carried through the calculations that yield the final result and the final result is rounded to the number of significant figures appropriate to the accuracy of the analytical method. Please note that results appearing in the columns preceding the final result column may have been rounded in order to fit the report format and therefore, if carried through the calculations, may not yield an identical final result to the one reported.

The stated LOQs for each analyte represent the demonstrated LOQ concentrations prior to correction for desorption efficiency (if applicable).

Unless otherwise noted below, reported results have not been blank corrected for any field blank or method blank.

L319759 (Report ID: 834684):  
 Reported results reflect elemental analysis of the requested metals. Certain compounds may not be solubilized during digestion, resulting in data that is biased low.  
 SOPs: MT-SOP-9(25), im-mwvfilt(20)

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated uncertainty applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Potassium	+/-7.3%	97.9%

Parameter	Method	PEL
Potassium	mod. NIOSH 7300/mod. OSHA ID-125G; ICP/I	NA

L319759 (Report ID: 834005):  
 PNOR = Particulates Not Otherwise Regulated.  
 SOPs: GRAV-SOP-7(4)  
 Dust analytical accuracy is within +/- 0.036 mg (95% confidence interval or k=2). The estimated uncertainty applies to the media, technology, and SOP(s) referenced in this report and does not account for any uncertainty associated with the sampling process.

Parameter	Method	PEL
Total Dust	mod. NIOSH 0500; Gravimetric	PNOR 15 mg/m3 (TWA)

< -Less Than      mg -Milligrams      m3 -Cubic Meters      kg -Kilograms  
 > -Greater Than    ug -Micrograms      l -Liters            NS -Not Specified  
 NA -Not Applicable    ND -Not Detected      ppm -Parts per Million



801531429284  
 Date: 05/29/14  
 Shipper: FEDEX  
 Initials: cms  
 Pre-p: PSY298468



Need results by: (surcharge)

<input checked="" type="checkbox"/>	5 Business Days	0%
<input type="checkbox"/>	4 Business Days	35%
<input type="checkbox"/>	3 Business Days	50%
<input type="checkbox"/>	2 Business Days	75%
<input type="checkbox"/>	Next Day by 6pm	100%
<input type="checkbox"/>	Next Day by Noon	150%
<input type="checkbox"/>	Same Day	200%

Sample Identification\*  
 (Maximum of 20 characters, ID's longer than 20 characters will be abbreviated.)

D 101
D 102
D 105

Site Name: DNR Peshtigo  
 Comments:

List description of industry or process/interferences present in sampling area:

Date Sampled* (mm/dd/yy)	Collection Medium	Sample Volume, Sample Time, or Sample Area*	Sample Units*: L, ml, min., in <sup>2</sup> , cm <sup>2</sup> , ft <sup>2</sup>
05/28/14	37 mm MW MCE	480	L
05/28/14	37 mm MW MCE	480	L
05/28/14	37 mm MW MCE	Blank	Blank

State samples were collected in (ex. NY): WI

Analysis Requested*	Method Reference^
potassium, total dust	
potassium, total dust	
potassium, total dust	

Hexavalent Chromium Process (ex. welding, plating, painting, etc.)\*

Please indicate which OEL this data will be used for:  
 OSHA PEL  ACGH TLV  Cal OSHA  
 MSHA  Other (specify):

New Client? Report To\*: Mr Rick Pager Invoice To\*: Mr. Dan Feldt  
 Client Account No.\*: 21621 Stantec Consulting  
 12075 Corporate Parkway #200  
 Mequon, WI 53092  
 Phone No.\*: 1-262-241-4466  
 Cell No.:  
 Email Results To: Mr. Dan Feldt  
 Email Address: richard.pager@stantec.com  
 Purchase Order No.:  
 Credit Card:  Credit Card on File  Call for Credit Card Info  
 Samples submitted using the FreePumpLoanTM Program.  Samples submitted using the FreeSamplingBadgesTM Program.

Project: 19370658 Virkon Sampling  
 Sampled By: Rick Pager

\*Galson Laboratories will substitute our routine/preferred method if it does not match the method listed on the COC unless this box is checked:  Use method(s) listed on COC  
 For metals analysis: if requesting an analyte with the option of a lower LOQ please indicate if the lower LOQ is required (only available for certain analytes see SAG):

For crystalline silica: form(s) of silica needed must be indicated (Quartz, Cristobalite, and/or Tridymite)\*:

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by:	Richard Pager	<i>Richard Pager</i>	5/28/14 13:17
Received by LAB:		<i>[Signature]</i>	5/29/14 1251

Samples received after 3pm will be considered as next day's business.  
 \*Required fields, failure to complete these fields may result in a delay in your samples being processed.