



November 17, 2021

Captain Matt Shaw  
Wisconsin Air National Guard, 115CES/CEIE  
Dane County Airport/Truax Field  
3110 Mitchell Street, Building 1210  
Madison, WI 53704

Via Electronic Mail Only to [matthew.shaw.3@us.af.mil](mailto:matthew.shaw.3@us.af.mil)

Subject: Infiltration/Injection Temporary Exemption Request for the Wisconsin Air National Guard, Truax Field, Madison, WI. WDNR BRRTs Activity #02-13-581254

Dear Captain Shaw:

The Wisconsin Department of Natural Resources (DNR) received a report on November 15, 2021 titled: "Supplemental Work Plan at Building 430, Truax Field, Madison Wisconsin" that was prepared for the Wisconsin National Guard (WANG), Truax Air National Guard Base. The report was prepared and submitted on your behalf by ORIN Technologies, LLC (ORIN). In addition, on November 16, 2021 WDNR received a letter from you requesting a temporary exemption to NR 140 and NR 812.05, Wisconsin Administrative Codes for the purpose of completing a proposed pilot scale study to evaluate the effectiveness of in-situ bioremediation of perfluoroalkyl and polyfluoroalkyl substances (PFAS) chemicals present in the subsurface soil and groundwater at the WANG base at Truax.

This letter grants a temporary exemption for the injection of a remedial material into the groundwater. The pilot study proposes to inject Bioavailable Absorbent Media (BAM), calcium peroxide, and indigenous bacteria thought to be capable of degrading PFAS into the subsurface soil and groundwater at the WANG base. This temporary exemption is intended to provide assurances to WANG that the pilot study to be completed in response to a release of contaminants on the WANG base is conducted in accordance with s. 292.12, Wis. Stats.

The DNR also received a request for a WPDES General Permit for Contaminated Groundwater from Remedial Action Operations on November 9, 2021. The DNR granted a WPDES General Permit for injecting material into groundwater on November 16, 2021. A copy of that approval is provided with this letter.

The pilot study proposes to inject BAM, calcium peroxide and indigenous bacteria into the groundwater in the grassy area located south of the base fire department, Building 430. This area is referred to on page 21 of 66 in the ORIN report as Building 430 Nozzle Test Area 2. This area regularly received Aqueous Film Forming Foam (AFFF) that contained PFAS compounds during testing of fire fighting equipment. The treatment area is 40-ft by 40-ft injection array and its location is towards the southern end of Building 430 Nozzle Test Area 2. Four groundwater monitoring wells were installed in and surrounding the injection area. Recent groundwater samples collected from this area show total PFAS concentrations (a sum of the PFAS compounds measured) ranging from 23,628 ng/l to 37,288 ng/l with PFOS concentrations ranging between 12,000 ng/l and 18,000 ng/l.

The submitted materials include the following information about the BAM and calcium peroxide:

- BAM is a pyrolyzed, recycled cellulosic bio-mass product
- BAM has diverse pore sizes and high sorbency

- Calcium peroxide is to enhance the degradation of contaminants in groundwater over time through the release of oxygen

In addition to placing BAM and calcium peroxide into groundwater for increasing dissolved oxygen in groundwater, the pilot study will also implement the use of an EKOGRID system. The EKOGRID is designed to increase oxygen concentrations in water by using an electric current passing through anodes and cathodes placed into the ground to cause the hydrolysis of water. By alternating electrical current the EKOGRID can also be used to help distribute the BAM and calcium peroxide throughout the subsurface of the test area.

**Determination on the NR 812 Injection Prohibition:**

The injection prohibition under s. NR 812.05, Wis. Adm. Code, is not applicable in this case because the proposed action is a Department-approved activity necessary for the remediation of groundwater. This letter serves as your approval from the Department to inject BAM along with calcium peroxide and bacteria to treat PFAS compounds in soil and groundwater, in accordance with this temporary exemption. This approval was conveyed by the Drinking Water and Groundwater Program on November 16, 2021.

**NR 140 Temporary Exemption:**

Department approval is hereby granted to the Wisconsin Air National Guard for the injection of BAM, calcium peroxide and bacteria into groundwater on the WANG base located at the Dane County Airport, with certain terms and conditions as outlined later in this letter. This approval was conveyed by the Drinking Water and Groundwater Program on November 16, 2021. The expiration date of this temporary exemption shall be two years from the date of this letter.

The need to obtain a temporary exemption for the injection of a remedial material for which a groundwater quality standard has not been established is required under s. NR 140.28 (1) (d), Wis. Adm. Code. Based on the information provided by your consultant, it appears the requirements for a temporary exemption for the injection of a remedial material for which a groundwater quality standard has not been established under s. NR 140.28 (1) (d) have been or will be met, in accordance with s. NR 140.28 (5) (c) and (d), Wis. Adm. Code.

**DNR approval is granted with the following terms and conditions:**

- A. General:
  1. The remedial action for restoring contaminated groundwater or soil, and any infiltrated or injected contaminated water and remedial materials, shall achieve the applicable response objectives required by s. NR 140.24 (2) or s. NR 140.26 (2), Wis. Adm. Code, within a reasonable period of time.
  2. The type, concentration and volume of substances or remedial material to be infiltrated or injected shall be minimized to the extent that is necessary for restoration of the contaminated groundwater.
  3. Any infiltration or injection of contaminated water or remedial material into groundwater shall not significantly increase the threat to public health or welfare, or to the environment.
  4. No uncontaminated or contaminated groundwater, substance or remedial material shall be infiltrated or injected into an area where a floating non-aqueous liquid is present in the contaminated groundwater.
  5. There shall be no expansion of soil or groundwater contamination, or migration of any infiltrated or injected contaminated water or remedial material, beyond the edge of previously contaminated areas, except that infiltration or injection into previously uncontaminated areas may be allowed if the Department determines that expansion into adjacent, previously uncontaminated areas is necessary for the restoration of the contaminated groundwater, and the requirements of s. NR 140.18 (1), Wis. Adm. Code will be met.
  6. All necessary federal, state, and local licenses, permits and other approvals are obtained and compliance with all applicable environmental protection requirements is required.
  7. A WPDES general permit for Discharge of Contaminated Groundwater from Remedial Action Operations was issued by the Department on November 16, 2021. That approval is included with this approval letter.

**B. Specific:**

1. The remedial materials to be injected to the groundwater shall be limited to BAM, calcium peroxide and bacteria indigenous to this site.
2. The remedial material and injection project shall be implemented as described in the November 17, 2021 submittal to DNR from ORIN titled: "Supplemental Work Plan at Building 430, Truax Field, Madison Wisconsin".
3. WANG shall notify the DNR of field activities prior to implementation.
4. A summary report describing the remediation, chemical amounts used, other field information and observations regarding the remedial effort shall be submitted to DNR within 1 month of initial field activities (well installation, BAM/calcium peroxide/bacteria injection, start-up of EKOGRID, etc.) being completed.
5. An additional summary report shall be provided by July 1, 2022. This report shall submit the results of soil and groundwater analyses completed prior to that date. An analysis of available data shall be used to provide an opinion on the efficacy of the remediation process. The report shall also provide an outline of intended future sampling events and a date as to when the results of those sampling events shall be completed. The report should estimate a timeframe for completion of the pilot study.
6. Upon completion of the pilot study WANG shall provide a summary report outlining the overall process used in the pilot study, the results of all soil and groundwater analyses completed, and an analysis of available data. The summary report shall provide an opinion as to whether PFAS compounds were degraded by biodegradation or whether changes in PFAS from the start to the end of the project are different due to another process such as absorbing on to the BAM. The opinion should be supported by the data collected during the study.
7. Any significant changes to the study procedures as outlined in the ORIN document dated November 15, 2021 shall be submitted to the Department for approval prior to the changes being implemented at the WANG site. This includes, but is not limited to, adjustments to the volume/mass of the material injected, additional injection points, number of injection events, and/or changes in the type of remediation media used in the injection points.
8. Modifications to the sampling schedule may be requested.
9. In the event of future injection activities or the need for additional time to study changes in groundwater quality, the responsible party may apply for an extension of this approval. A request for an extension of this approval must be received by the Department 30 days before the expiration date.
10. Any permit extension approvals will be dependent on WI DNR review of site-specific data or any other information it deems necessary.
11. Upon completion of the project, the injection holes must be abandoned in accordance with s. NR 141.25, Wis. Adm. Code, and later topped off with grout or native soils if settling occurs, unless converted to NR 141 complying monitoring wells, or an alternative approved by the DNR Project Manager.

**Monitoring Conditions:**

1. The actual volume of material injected shall be recorded for each injection point.
2. Groundwater monitoring shall take place as proposed in the ORIN proposal. Frequency shall be:
  - 1 week post injection
  - 3 weeks post injection
  - 5 weeks post injection
  - Monthly after that

The summary report provided by July 1, 2022 shall outline future groundwater sampling events.

3. Groundwater samples shall be collected and analyzed for DO, pH, ORP, depth to water, conductivity, temperature, the DNR approved list of 33 PFAS compounds, total organic fluorine, total fluoride, and calcium. The DNR is requesting that in addition to the 33 PFAS compounds included with the approved PFAS analytical protocol, one additional compound be added. This compound, 10:2 FTS (CAS number 120226-60-0), may be a pre-cursor to some of the perfluoro carboxylic acids detected in the study area. This is a request of the WANG and not a requirement from the DNR.
4. Analysis of soil samples is not proposed at this time. As funding becomes available WANG can consult with DNR on analyses that may be completed on soil samples.
5. A site Health and Safety Plan shall be followed.

Verification of PFAS degradation (i.e. – complete defluorination) with any treatment/remediation technology is challenging with available lab analytical methods. DNR recommends that the project team (WANG/ORIN/Fixed Earth) communicates with your lab about data quality objectives. Specifically, for total organic fluorine, DNR notes there is no EPA approved method and therefore DNR recommends discussions with your lab on likely detection limits, necessary sample volumes and consideration of sample replicates.

Failure to adhere to the provisions of this temporary exemption to NR 140, Wis. Adm. Code may result in the DNR requiring revisions to the remedial action design, operation or monitoring procedures, or the revocation of this exemption and the implementation of an alternative remedial action to restore soil or groundwater quality, or both.

The DNR commends the efforts of WANG to implement this pilot scale study on PFAS degradation. If you have questions regarding this letter, please contact Steve Ales at 608-400-9187 or [stephenm.ales@wisconsin.gov](mailto:stephenm.ales@wisconsin.gov).

Sincerely,



Issac A. Ross  
South Central Region Supervisor  
Remediation and Redevelopment Program  
Fitchburg DNR Service Center – Fitchburg, WI

**Cc:** Steve Ales, WDNR – via email at [stephenm.ales@wisconsin.gov](mailto:stephenm.ales@wisconsin.gov)  
Phil Bower, WDNR – via email at [Phillip.bower@wisconsin.gov](mailto:Phillip.bower@wisconsin.gov)  
Brian Austin, WDNR – via email at [Brian.Austin@wisconsin.gov](mailto:Brian.Austin@wisconsin.gov)  
Maya Welch, WDNR – via email at [maya.welch@wisconsin.gov](mailto:maya.welch@wisconsin.gov)  
Matt Silver, WDNR – via email at [matthew.silver@wisconsin.gov](mailto:matthew.silver@wisconsin.gov)  
Mike Hinman, WANG – via email at [michael.hinman.4@us.af.mil](mailto:michael.hinman.4@us.af.mil)  
Larry Kinsman, ORIN – via email at [lkinsman@orinrt.com](mailto:lkinsman@orinrt.com)

**Attach:** WPDES General Permit No. WI-0046566-07-0 for Truax WANG Base



November 16, 2021

Matthew L. Shaw, Capt, WI ANG  
115 CES/CEIE  
Dane County Regional Airport, Truax Field  
3110 Mitchell St, Bldg 1210  
Madison, WI 53704-2529  
//Sent electronically

**SUBJECT:** Coverage under WPDES General Permit No. WI-0046566-07-0  
Permittee Name: WI ANG - 115<sup>th</sup> Fighter Wing  
Site Name: Biological In-Situ PFAS Injection – WI ANG  
Site Address: 3110 Mitchell St, Madison WI, 53704  
Site ID (FIN): 80250

Dear Capt. Shaw:

The Department has determined that the proposed discharge to groundwater from the PFAS injection study located at **Truax Field** is eligible for coverage and is hereby authorized under the *Contaminated Groundwater from Remedial Action Operations* Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit No. WI-0046566-07-0. This determination was based on review of a complete eNOI and Discharge Management Plan submitted by, **Larry Kinsman, Project Manager – Orin Technology** and received on **11/9/2021**. Please download the permit and fact sheet from the Department website at:  
<https://dnr.wisconsin.gov/topic/Wastewater/GeneralPermits.html>.

The Department is also approving the discharge management plan in accordance with Section 3.2 of the *Contaminated Groundwater from Remedial Action Operations* WPDES General Permit No. WI-0046566-07-0. The discharge management plan satisfies the requirements in Section 3 of the general permit.

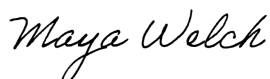
The proposed DPT injection of **Bioavailable Absorbent Media (BAM), Calcium Peroxide and PFAS Degrading Microbes** to groundwater is eligible for coverage and is hereby authorized under the *Contaminated Groundwater from Remedial Action Operations* WPDES General Permit No. WI-0046566-07-0 in accordance with s. NR 205.08, Wis. Adm. Code, subject to the following general permit conditions:

1. Coverage Effective Date: Coverage at your facility will become effective under this permit upon the date of this letter until permit coverage termination, revocation, or reissuance of the general permit. This permit applies only to the discharge activities and sites described in the eNOI for the above referenced project.
2. Discharge Management Plan: The permittee shall operate consistent with the approved discharge management plan. A copy of the discharge management plan shall be retained by the permittee and this plan shall be made available upon department inspection or submitted to the department upon request. Permittees shall notify the department when the discharge management plan is amended to determine if the amendment requires department approval.
3. Reporting: The permittee is exempt from monitoring and reporting under this general permit and shall follow the terms and conditions of the remedial action plan approval under ch. NR 724, Wis. Adm. Code, and the temporary exemption granted under s. NR 140.28(5), Wis. Adm. Code.

4. Coverage Termination: Once the project is completed, please complete and submit a Notice of Termination (Form 3400-221) to the Department available at <http://dnr.wi.gov/topic/wastewater/GeneralPermits.html>.
5. Change of Authorized Representative: If you plan on changing the authorized representative contact for the facility or you want to assign a new person to be a duly authorized representative to submit specific permit documents on your behalf, please complete and submit a Delegation of Signature Authority (Form 3400-220) to the Department available at <http://dnr.wi.gov/topic/wastewater/GeneralPermits.html>.
6. Facility Changes: If there have been or will be any changes in facility operations that result in new or different wastewater discharges to the waters of the state, please contact the Department consistent with Section 7.1.6 of the general permit. If reapplication is necessary, please complete a notice of intent (NOI) form for the applicable general permit to verify that your discharge is eligible for that general permit. NOI forms are available at <http://dnr.wi.gov/topic/wastewater/GeneralPermits.html>.
7. Compliance with Permit Conditions: You are responsible for compliance with the general permit requirements and conditions listed above and all other applicable requirements and conditions contained in the general permit. **To assure you remain in compliance and avoid any enforcement action, please read the general permit over carefully.**

Additional information regarding the Department's legal authority in this matter and your rights of appeal are shown below. Please contact me by phone: 414-897-5715 or email: [maya.welch@wisconsin.gov](mailto:maya.welch@wisconsin.gov) if you have any questions.

Regards,



Maya Welch  
Wastewater Specialist  
Water Quality Bureau - Water District South

ec: Larry Kinsman, Project Manager - ORIN Technology  
Steve Ales, R&R Hydrogeologist - WI DNR  
Trevor Moen, Wastewater Engineer – WI DNR  
Permit File(s) Biological In-Situ PFAS Injection – WI ANG

## LEGAL AUTHORITIES AND APPEAL RIGHTS

Section 283.35(1), Wis. Stats., authorizes the Department to issue a general permit applicable to a designated area of the state authorizing discharges from specified categories or classes of point sources located within that area. Upon the request of the owner or operator of a point source, the Department shall withdraw the point source from the coverage of a general permit and issue an individual Wisconsin Pollutant Discharge Elimination System (WPDES) permit for that source in accordance with s. 283.35(2), Wis. Stats. Additionally, the Department may withdraw a point source from the coverage of a general permit and issue an individual WPDES permit if that source meets any of the factors listed in s. 283.35(3), Wis. Stats. Issuance of such an individual permit will provide for a public comment period, and potentially a public informational hearing and/or an adjudicatory hearing. In lieu of general permit withdrawal, the Department may refer any violation of a general permit to the Department of Justice for enforcement under s. 283.91, Wis. Stats., pursuant to s. 283.89, Wis. Stats. In order to remain in compliance and avoid any enforcement action, **please read your permit carefully.**

To challenge the reasonableness of or necessity for any term or condition of an issued, reissued, or modified general permit, s. 283.63, Wis. Stats., and ch. NR 203, Wis. Adm. Code, require that you file a verified petition for review with the Secretary of the Department of Natural Resources within 60 days after notice of the permit decision was issued by the Department. For other permit-related decisions, such as the decision to confer general permit coverage to your facility, that are not reviewable pursuant to s. 283.63, Wis. Stats., it may be possible for permittees or other persons to obtain an administrative review pursuant to s. 227.42, Wis. Stats., and s. NR 2.05(5), Wis. Adm. Code, or a judicial review pursuant to s. 227.52, Wis. Stats. If you choose to pursue one of these options, you should know that Wisconsin Statutes and Administrative Code establish time periods within which requests to review Department decisions must be filed.