

INSTRUCTIONS AND SAMPLE FORMAT FOR PREPARING A PETITION FOR VARIANCE FOR AN AQUIFER REMEDIATION ZONE OF DISCHARGE

The Bureau of Petroleum Storage Systems encourages users and manufacturers of injection-type in situ aquifer remediation fluids to strive to meet the injection requirements of Chapter 62-528, Florida Administrative Code (F.A.C.), which are the minimum groundwater criteria of Rule 62-520.400, F.A.C., the primary and secondary drinking water standards of Rules 62-550.310 and 62-550.320, F.A.C., respectively, and the groundwater criteria of Chapter 62-777, F.A.C.

In cases where injected fluids do not meet the requirements of Chapter 62-528, F.A.C., permission for a temporary injection zone of discharge (ZOD) must be obtained either by rule or by variance, or by a combination of rule and variance, depending on the chemical composition of the fluid. In most (though not all) cases, it will be necessary to use only Rule 62-520.310(8)(c), F.A.C., to obtain permission for a temporary injection ZOD. This rule permits a temporary injection ZOD for the following: (a) the primary groundwater standards for closed-loop reinjection systems; (b) the prime constituents of the reagents used to remediate contaminants; and (c) the secondary groundwater standards. An explanation of Rule 62-520.310(8)(c), F.A.C., including discussion about primary, secondary and minimum groundwater contaminants, and the prime constituents of reagents can be found in guidance document *BPSS-10, In Situ Chemical Additives*, currently located under the heading of *Active Remediation Guidance* at web page www.dep.state.fl.us/waste/categories/pcp/pages/pg_documents.htm. The granting of a temporary injection ZOD by variance does not negate the need to prepare a site-specific Remedial Action Plan that must be approved by the Department before the injection can occur.

1. These instructions, inclusive of a fictitious sample petition, are provided as a downloadable Microsoft Word file named "Variance_Petition_Format_4-21-2010.doc". Petitioners can use this sample as a starting point in order to avoid the typewriting of an entire petition from scratch. (The Bureau of Petroleum Storage Systems attempted to create a fill-in-the-blanks type petition, but found it too difficult to create a form that would cover all types of injected fluids. It therefore settled on a format that the petitioner can edit and tailor to the specific remediation fluid.)
2. The portions of the sample petition printed in black-colored font are those that are not likely to be modified by a petitioner. However, since there is a variety of fluids that may be the subject of zone of discharge petitions, some petitioners may find it necessary to adjust these black-colored font areas. (Note: Some computer screens may show white or some other color instead of black.)
3. The portions of the sample petition printed in pink-colored font are those that are most likely to be modified by the petitioner. Petitioners are instructed to edit and tailor the pink-colored areas as necessary to accurately describe the needs of their particular injection fluid; for example: composition, zone of discharge size, zone duration, monitoring parameters, etc.
4. Sign and submit petitions for ZOD variances to: Office of the General Counsel, Attention: Agency Clerk, Florida Department of Environmental Protection, MS 35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000.
5. Upon receipt of a petition, the Office of General Counsel will assign it a case number and then forward it to the Underground Injection Control Section of the Division of Water Resource Management. The petition will then be reviewed by staff of different disciplines in the Office of General Counsel, the Division of Water Resource Management, and the Division of Waste Management for comments. The comments, if any, of these reviewers will be compiled by the Underground Injection Control Section and sent to the petitioner, along with a request to revise the petition as necessary. When the Department is satisfied with a petition (or a revised petition) it is then published in "The Florida Administrative Weekly" for a required 2-week public comment period. If there are no public comments, then a variance is granted.
6. The Bureau of Petroleum Storage Systems, in the attached sample petition, has attempted to cover the needs of most petitioners, but it must not be construed as all-inclusive. Ultimately, the onus is on the petitioner to accurately describe the chemical composition of the fluid to be injected, and to explain which ingredients of the fluid require a ZOD by variance, and which can be permitted a ZOD by Rule 62-520.310(8)(c), F.A.C., and to identify or develop a laboratory analytical method for the analysis of any components for which groundwater monitoring will be required in order to comply with the terms of a rule or a variance order granting a ZOD.
7. Petitioners should note that the attached petition format is provided by the Bureau of Petroleum Storage Systems only as a convenience, in order to reduce the amount of typewriting required on the part of the petitioner. Its use should neither be construed as a guarantee that the Florida Department of Environmental Protection will issue a variance, nor as a guarantee that no revision or clarification of petitioner-inserted information will be requested by the Department.

**BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

IN RE: Careful Chemical Company

PETITION FOR VARIANCE
FROM RULE 62-520.310(7), FLORIDA ADMINISTRATIVE CODE

Petitioner, Careful Chemical Company, pursuant to Section 120.542, Florida Statutes, and Rule 28-104, Florida Administrative Code, hereby petitions for a variance from Rule 62-520.310(7), Florida Administrative Code, because strict application of this rule will create a substantial hardship and will violate principles of fairness. In support thereof, petitioner states:

Background Facts

1. Petitioner is Careful Chemical Company, located at 333 Moonbeam Street, Cloverland, Ohio 44130 , telephone 216-123-4567, facsimile 216-123-5678.
2. The Petitioner manufactures sodium permanganate that will be used in aqueous solution, at concentrations of 10% or less, to remediate contaminants including but not limited to chlorinated ethenes, phenolics and polyaromatic hydrocarbons .
3. The remedial process utilizes sodium permanganate as an oxidizing agent to destroy contaminants. The sodium permanganate is an inorganic oxidant typically supplied in a liquid form at 39.5 - 41.0% by weight. The sodium permanganate mixture is typically shipped as a dark liquid that is diluted prior to injection. Sodium permanganate is injected into the soil and groundwater through the use of wells and/or borings. Sodium permanganate will oxidize the contaminants of concern to form the end products carbon dioxide, water, manganese dioxide, sodium, and in some cases, chloride salts.
4. Full-scale remediation using sodium permanganate has been employed at numerous sites, which demonstrated high levels of success in reducing levels of PCE, TCE, DCE, Vinyl Chloride, PCP and other contaminants.
5. Sodium permanganate is derived from manganese ore that may contain trace metals regulated by primary drinking water standards. As a result, when it is used to remediate contaminated aquifers, the concentrations of the trace metal impurities thallium, beryllium, antimony, arsenic, chromium, lead, cadmium, mercury, and selenium in the groundwater may temporarily exceed their primary drinking water standards. The concentration of sodium, a prime constituent of sodium permanganate, may exceed its state primary drinking water standard. The secondary standards for aluminum, color, iron, manganese and total dissolved solids may also be temporarily exceeded in the immediate area around each

injection point. The presence of the aforementioned **trace metals** will have no anticipated adverse impact to human health because such exceedances will occur only in groundwater that has already been impacted by the contaminant(s) of concern and thereby already unsuitable for domestic purposes. In addition, as the **oxidant state of the aquifer is reduced over time, these trace metals will strongly and preferentially adsorb to the soil matrix through soil-groundwater equilibrium partitioning, resulting in significantly lower trace metal concentrations in groundwater.**

The Rule

6. Rule 62-520.310(7) provides that:
No installation shall directly or indirectly discharge into groundwater any contaminant that causes a violation in the water quality standards and criteria for the receiving groundwater established in Chapter 62-520, F.A.C., except within a zone of discharge established by permit or rule pursuant to that chapter.
7. Furthermore, Rule 62-520.310(9) provides that:
Other discharges through wells or sinkholes that allow direct contact with Class G-I, Class F-I, or Class G-II groundwater shall not be allowed a zone of discharge.
8. Pursuant to Rule 62-520.420, the water quality standards for Class G-1 and G-II groundwaters are the minimum criteria provided in Rule 62-520.400, and the primary and secondary drinking water quality standards as set forth in Rules 62-550.310 and 320. Additionally, minimum groundwater criteria for specific chemical species are listed in Chapter 62-777, F.A.C.
9. No other chemical species or parameters, with the exception of **aluminum, antimony, arsenic, beryllium, cadmium, chromium, color, iron, lead, manganese, mercury, selenium, sodium, thallium and total dissolved solids**, as regulated in Chapters 62-520, 62-550, and 62-777, F.A.C., are associated with **sodium permanganate** when injected. Therefore no zone of discharge for any other chemical species is required.
10. Rule 62-520.310(8)(c) allows a temporary zone of discharge for the primary drinking water standards for groundwater for closed-loop re-injection systems and for the prime constituents of the reagents used to remediate site contaminants, and for the secondary standards for groundwater, when Class V, Group 4 injection wells are specified in a Department-approved remedial action plan that addresses the duration and size of the zone of discharge and groundwater monitoring requirements. For **sodium permanganate**, Rule 62-520.310(8)(c) allows a temporary zone of discharge for the prime constituents **sodium and manganese**, and for the secondary standards for **aluminum, color, iron and total dissolved solids**. It does not, however, allow a temporary zone of discharge for the primary

standard trace metal impurities antimony, arsenic, beryllium, cadmium, chromium, lead, mercury, selenium and thallium.

Statute Implemented

11. Rule 62-520.310(7) implements Section 403.021, 403.061, 403.087 and 403.088, Florida Statutes, and has, as its specific authority, Section 403.061, Florida Statutes.

Type of Action Required

12. Careful Chemical Company is requesting a variance from the restrictions imposed by Rule 62-520.310(7) that would prohibit the Department from granting a zone of discharge in conjunction with the approval of remedial action plans proposing the use of sodium permanganate to clean up sites contaminated by, but not limited to, chlorinated ethenes, phenolics and polyaromatic hydrocarbons.

Specific Facts Which Demonstrate a Substantial Hardship or Violation of Principles of Fairness

13. Careful Chemical Company has found there is no long-term effect on groundwater parameters from the injection of sodium permanganate. The injected fluid, at a maximum overall concentration of up to 10 percent sodium permanganate by weight, may contain as much as 0.875 mg/kg thallium, 0.125 mg/kg beryllium, 0.175 mg/kg antimony, 1.00 mg/kg arsenic, 1.25 mg/kg chromium, 0.175 mg/kg lead, 0.025 mg/kg cadmium, 0.008 mg/kg mercury and 0.13 mg/kg selenium, which are regulated as primary standards. It may also contain as much as 0.50 mg/kg aluminum, 0.50 mg/kg iron, 38,709 mg/kg manganese, 100,000 mg/kg total dissolved solids, and color in excess of 15 color units, which are regulated as secondary standards. Should the concentrations of these chemical species and the level of color in the groundwater exceed their respective primary and secondary standards as a result of the injected fluid, then the area impacted will extend no more than 50 feet radially from each point of injection. No other constituents of sodium permanganate will exceed a primary or secondary drinking water standard, or a minimum groundwater criterion. It is expected that the concentrations of the aforementioned parameters will return to their respective criteria and standards, or their natural-occurring background levels, whichever is less stringent, within 1 year through dilution by the groundwater and adsorption to soil particles.

14. Pursuant to Rule 62-528.300(1)(e)4b, the introduction of **sodium permanganate** into the groundwater will be via Class V, Group 4 injection wells associated with aquifer remediation projects.
15. The Staff of the Department's Division of Waste Management is familiar with the technical aspects of injection-type aquifer remediation technologies and is willing to approve their use in the remediation of groundwater at contaminated sites. However, the provisions of Rule 62-520.310(7) would appear to prohibit the injection of **sodium permanganate** except within a zone of discharge, and Rule 62-520.310(9) prohibits the Department from granting a zone of discharge through an injection well to Class G-I and G-II groundwaters.
16. Strict adherence to the prohibition of Rule 62-520.310(7) would preclude the Department from granting approval for the use of **sodium permanganate** to **oxidize** the target contaminants.
17. Rule 62-520.310 is designed to protect the underground sources of drinking water of clean aquifers. However, the prohibition of a zone of discharge in Class G-I and G-II groundwaters to be remediated by **sodium permanganate** is a hindrance to a reasonable, common sense remedial process that may cause only temporary exceedence of groundwater criteria over a very limited area in what is already a highly contaminated aquifer.
18. The injection of **sodium permanganate** can accomplish the remediation of contaminated aquifers more effectively, more quickly, and at a greater reduced cost over traditional methods. Therefore, a strict adherence to the zone of discharge prohibition will have the result of decreasing the effectiveness of site remediation, unnecessarily increasing the cost of remediation, lengthen the time needed to complete the remediation process, and prolong aquifer restoration.

The Requested Variance Will Serve the Purpose of the Underlying Statute

19. As set forth in Section 403.021(2), Florida Statutes:
It is declared to be the public policy of this state to conserve the waters of the state and to protect, maintain and improve the quality thereof for public water supplies, for propagation of wildlife and fish and other aquatic life, and for the domestic, agricultural, industrial, recreational and other beneficial uses and to provide that no wastes be discharged into any waters of the state without first being given the degree of treatment necessary to protect the beneficial uses of such waters.
20. There are no adverse impacts on human health or the environment that result from a temporary increase from the secondary standards in the aquifer for **aluminum, color, iron, manganese and total dissolved solids**, which may be caused by injection of **sodium permanganate**, nor the potential for a slight elevation in the concentration of the **trace metal impurity** primary groundwater contaminants

antimony, arsenic, beryllium, cadmium, chromium, lead, mercury, selenium, and thallium, or the temporary increase in the concentration of prime constituent sodium. The temporary exceedence of these parameters in conjunction with remediation of underground sources of water already contaminated by chlorinated ethenes, phenolics and polyaromatic hydrocarbons will not only allow for the protection and conservation of public water supplies, but will have the net effect of improving those public water supplies. Therefore, the variance requested herein will serve the purpose of the underlying statute.

Conclusion

21. Rule 62-520.310(7) precludes the Department from approving the use of a site remediation technology that can quickly and effectively clean up groundwater at contaminated sites at substantial cost savings. The use of this product will not only not cause any adverse impacts to the potential underground drinking water sources, but, in fact, will contribute significantly to improving the quality of those sources.

WHEREFORE, Careful Chemical Company requests that the Department grant a Variance to Rule 62-520.310(7), in order to permit a temporary zone of discharge for sodium permanganate, extending 50 feet radially from each point of injection, for a period of time not to exceed 1 year, as part of the approval for a remedial action plan proposing the use of sodium permanganate, with condition that the Underground Injection Control Section provide comments to the Division of Waste Management, on any remedial action plan proposing the use of sodium permanganate, as to the appropriateness of the use of that product in the specific hydrogeologic setting.

Careful Chemical Company understands that the composition of the injected sodium permanganate fluid will necessitate the monitoring of groundwater at each remediation site for the primary contaminants antimony, arsenic, beryllium, cadmium, chromium, lead, mercury, selenium, sodium and thallium, and secondary parameters aluminum, color, iron, manganese and total dissolved solids. The monitoring will be addressed in a remedial action plan that is proposed, and will be conducted before and after the injection of sodium permanganate. The monitoring will be discontinued for each of these parameters only after the parameter has returned to its respective standard set forth in Rule 62-550.310, Rule 62-550.320, or Chapter 62-777, F.A.C., or its natural-occurring background level, whichever is less stringent.

Submitted By:

Petitioner Name

Signature and Date