pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Regional Permit Coordination Office

Stormwater Drainage Wells

Frequently Asked Questions (FAQ)
March 3, 2021
Version 1.0

Background

Stormwater Drainage Wells are a Post-Construction Stormwater Management (PCSM) Best Management Practice (BMP) geared towards specifically addressing volume management through the discharge of treated[1] stormwater runoff through a bored shaft into the ground for groundwater recharge. This is a relatively new BMP that sometimes goes by different names, including but not limited to gravity drain, gravity well, and injection well. These terms may be used interchangeably in this document.

It is important to note that this BMP is considered a Class V Injection Well and would fall under EPA's Underground Injection Control (UIC) Program and should comply with application requirements or obtain a UIC permit from EPA. In addition to permitting from DEP, project proponents should contact EPA's UIC program for more information.

This BMP is not currently listed in the Stormwater BMP Manual, however the Department is currently working on guidance for these types of proposals. While EPA has a Class V Injection Program and has primacy with that Program, DEP still has responsibilities for protection of groundwater under the Clean Streams Law.

FAQ #1: Which office handles NPDES Permit Applications for Stormwater Drainage Wells?

Upon its establishment in January 2019, all NPDES Permit applications for projects in PA proposing stormwater drainage wells will be handled by the Regional Permit Coordination Office (RPCO). If you decide to pursue an injection well as a PCSM BMP, RPCO can be contacted at 717-772-5987 or RA-EPREGIONALPERMIT@pa.gov.

FAQ #2: If an injection well is being proposed as a PCSM BMP on a project that will require an NPDES Permit, must the permit be an Individual Permit regardless of the watershed designation?

Yes, if a proposed project triggers the requirements for an NPDES Permit for Stormwater Discharges associated with Construction Activities (Chapter 102) and includes an injection well, the project proponent will need to apply for an individual permit.

[1] Emphasis added on "treated" stormwater runoff.

FAQ #3: If an injection well is being proposed as a stormwater management facility on a project that does not require an NPDES Permit for construction activities (under an acre of disturbance), would any other approvals be required by DEP?

EPA has primacy of the Class V Injection well program. The applicant should contact EPA's UIC program for further guidance on how to proceed. It is our understanding that EPA will generally send a letter acknowledging the discharge and reminding the applicant that they cannot inject any water that will cause pollution and to contact PA DEP for further guidance. It will be up to EPA to determine if an UIC Injection Well Permit is needed.

If an NPDES permit requirements are not triggered and an injection well is proposed, then the project proponent will need to apply for and obtain a Water Quality Management (WQM) Part II Permit pursuant to the PA Clean Streams Law. For projects that do trigger NPDES permit requirements, DEP reserves its rights to also require a WQM Part II Permit depending on the size and complexity of the project and its potential for impacts to groundwater resources. All projects which propose injection wells will require a permit of some type. The review and approval of WQM Part II Permits are normally conducted by the Regional Clean Water Program. Contact information for each Regions Clean Water Program can be found on Regional Resources webpage.

FAQ #4: What special considerations, measures or studies will be necessary for DEP to review and authorize an injection well?

Injecting the stormwater is only a final disposal method – similar to the outfall from a detention basin - it is not in itself a treatment technology. Upon receipt of proposed stormwater drainage well (a.k.a. injection well), DEP will perform a thorough review of the proposed water quality treatment measures to prevent contamination of the groundwater. Per the PA Clean Streams Law, groundwater is a protected water of the Commonwealth and therefore measures need to be taken to protect against biological, chemical, and physical pollution of the receiving aquifer. The treatment considerations go beyond the traditional stormwater parameters depending upon the activities in the source area and the proposed treatment processes. During its review, DEP will also evaluate the source of the proposed runoff to be treated (e.g. roof runoff, pavement runoff, etc.). Based on the sources and anticipated pollutants, DEP will determine the number and extent of pre-discharge and post-discharge monitoring.

DEP will also review the permit application to make sure that the injection well will not become a physical hazard (i.e., sinkholes). This is especially important in areas with carbonate geology overlain with karst terrain. A geologic investigation of site conditions will likely be necessary, including test well(s) prior to installation of the final injection well. For any proposal, the minimum information needed includes professionally logged well information detailing the materials encountered, and the hydrogeologic characteristics of the well and formation(s). Furthermore, the well would need to be tested to assure that there are no hydrogeologic barriers to the acceptance of flow over the anticipated period of discharge (the acceptance rate which will keep the water level in the final injection well lower in elevation than the soil/bedrock interface). The permit application will need to

include calculations showing that the injection well can safely accept the discharge from the appropriate design storm.

The injection well will probably be in service for many decades. The effects of the discharge, and fast or slowly evolving changes in the subsurface often cannot be readily detected by the eye. They also cannot be readily predicted even with extensive subsurface exploration. This creates a need for real time monitoring of the water level in the aquifer adjacent to the injection well both during and between discharges, usually accomplished with triggering alarms.

Some changes in an aquifer can be abrupt leading to issues such as well collapse, or formation collapse in the subsurface drainage system some distance from the well. This can abruptly constrict subsurface flow causing a mounding effect in the aquifer past the soil/bedrock interface. This can subsequently result in surface ponding, sinkhole formation at or near to the injection well site, or a compromise of the structural integrity of the injection well itself. The stormwater management system needs to incorporate measures to promptly shut off flow to the injection well and/or divert flow to an appropriately sized and safely conveyed overflow. Submissions should incorporate a great deal of redundancy and large acceptance rate safety factors.

Some changes such as mineral encrustations or accumulation of solids can eventually clog water bearing zones slowly reducing acceptance rates. This can eventually cause the injection well to fail in its purpose resulting in ponding at the surface. Wells might be treated chemically or redeveloped depending upon the cause of the clogging.