EPA 833-B-22-001

Inspection and Monitoring Guide for Construction Dewatering

EPA's 2022 Construction General Permit

February 2022

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Contents

List of Appendices

List of Tables

List of Figures

Section 1: Introduction

This guide describes how to conduct inspections and turbidity benchmark monitoring for discharges from construction dewatering activities. Its target audience is operators covered under EPA's 2022 Construction General Permit (CGP) who will be discharging dewatering water.

Authorized dewatering discharges under EPA's CGP

The CGP defines dewatering as "the act of draining accumulated stormwater and/or groundwater from building foundations, vaults, and trenches, or other similar points of accumulation" (CGP, Appendix A). The CGP includes **uncontaminated** construction dewatering water as an authorized (i.e., allowed) non-stormwater discharge, provided the operator satisfies the conditions specified in Part 2.4 of the CGP.

This guide does not impose any new legally binding requirements on EPA, States, Tribes, territories, or the regulated community; it does not confer legal rights or impose legal obligations upon any member of the public. In the event of a conflict between this document and any statute, regulation, or permit, this document would not be controlling.

Interested parties are free to raise questions and objections about this guide's substance, and about its applicability to a particular situation. EPA retains the discretion to adopt approaches on a case-by-case basis that differ from those described in this guide, where appropriate.

1.A Introduction to CGP Dewatering Inspection and Monitoring Requirements

The 2022 CGP established inspection and turbidity benchmark monitoring requirements for dewatering discharges. These include the following:

- **Dewatering inspections for all sites.** All sites discharging dewatering water must complete inspections of dewatering operations once per day on any day there is a dewatering discharge. Operators must check for signs of sediment or other visual indicators of pollution in dewatering discharges and take corrective action, when needed.
- **Turbidity benchmark monitoring for operators discharging to sensitive waters.** Operators that discharge dewatering water to sensitive waters must sample that dewatering water once per day for turbidity analysis. They must then compare the weekly average results with the assigned benchmark threshold. Where weekly average turbidity results exceed the benchmark, the operator must take corrective action.

Sensitive waters

The CGP defines "sensitive waters" as receiving waters listed as impaired for sediment or a sediment-related parameter, or receiving waters designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes. See CGP, Part 3.3.

- **State, Tribal, or territorial required monitoring.** Dewatering discharges may be subject to additional State-, Tribe-, or territory-specific requirements. Consult CGP, Part 9, to determine if you must conduct additional monitoring at each dewatering discharge point.

Section 2: Prepare for Inspection and Monitoring

Preparing to inspect and monitor dewatering discharges requires that you collect information about your construction site and your site's dewatering operations. Most of this information should have been collected previously, to be used in submitting a Notice of Intent (NOI) for coverage under the CGP and developing the monitoring procedures section of the site's stormwater pollution prevention plan (SWPPP).

You will need to compile the dewatering information if it has not already been developed. This guide suggests resources for doing so—for example, determining receiving waters and evaluating SWPPP site map components. Note that EPA has a suggested template for SWPPPs, the *Construction Stormwater Pollution Prevention Plan (SWPPP) Template*, available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

2.A Determine Where Dewatering Discharges Are Occurring

What if my site does not discharge dewatering water?

The CGP does not require dewatering inspections or turbidity benchmark monitoring if dewatering water stays on-site. Retained water may, for instance, be allowed to evaporate or infiltrate into the soil (unless ground water contamination concerns exist as described in CGP, Part 2.2.2) or be used for on-site dust control, irrigation, or other construction-related purposes.

The following documents will direct you to the location(s) of dewatering discharges from your site, the first step toward planning for inspection of dewatering discharges and possible turbidity benchmark monitoring.

- A copy of the CGP and the accompanying fact sheet.
- A copy of the CGP NOI submitted to EPA. The NOI identifies the site's discharge points and receiving waters and indicates whether there will be a discharge of dewatering water.
- The SWPPP, which must include:
  - Procedures for dewatering inspection, maintenance, and corrective action (CGP, Part 7.2.7).
  - Procedures for turbidity benchmark monitoring from dewatering discharges, if applicable (CGP, Part 7.2.8).
  - A site map that:
    - Shows the location(s) of any receiving waters within the site and all receiving waters within 1 mile downstream of the site's discharge point(s) (CGP, Part 7.2.4.c).

Discharge point

For the purposes of the CGP, the discharge point is the location where concentrated stormwater flows or dewatering water are discharged from the construction site. See CGP, Appendix A.

- Identifies if any receiving waters are listed as impaired or identified as a Tier 2, Tier 2.5, or Tier 3 water (CGP, Part 7.2.4.c).
- Shows all discharge locations, as well as the location(s) where turbidity benchmark monitoring will take place, if applicable to your site (CGP, Part 7.2.4.g).

You should visit all dewatering operations and dewatering discharge points to verify the information in the SWPPP. For each dewatering operation, note:

- Whether ground water, accumulated stormwater, or a combination of the two is being dewatered. Ground water and stormwater have different potential pollutants.
- Whether the dewatering operation is continuous or intermittent and the expected frequency of dewatering discharges. Continuous dewatering may occur at sites with high ground water or alluvial aquifers, or when work is done next to receiving waters. Intermittent dewatering may occur during wet weather periods.
- Whether dewatering water is discharged to a municipal separate storm sewer system (MS4). If you discharge to an MS4, you should contact the operator of the system (e.g., the local public works department, the highway department) to alert them to the discharge.
- Whether the receiving water is a sensitive water.

You should consider taking photos of each dewatering operation and discharge point before commencing dewatering. You will later be able to use these initial photos as a baseline to identify erosion or other adverse impacts from dewatering.

Municipal separate storm sewer systems (MS4s)

An MS4 is "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains)…Owned and operated by a…public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes…that discharges to waters of the United States" and is "Designed or used for collecting or conveying storm water; which is not a combined sewer; and which is not part of a Publicly Owned Treatment Works" [40 CFR 122.26(b)(8)].

2.B Determine Which CGP Requirements Apply at Each Dewatering Discharge Point

Daily Dewatering Inspections

All operators must inspect dewatering operations once per day when dewatering discharge is occurring (CGP, Part 4.3.2). Daily dewatering inspections are in addition to site inspections required by CGP Part 4.2.

Turbidity Benchmark Monitoring

You must carry out turbidity benchmark monitoring if you discharge dewatering water to sensitive waters (CGP, Part 3.3). You must collect at least one turbidity sample from each dewatering discharge point, each day a discharge occurs. Samples may be taken at any time during the day while dewatering water is being discharged. You may consider taking the daily turbidity sample while you conduct daily dewatering inspections.

What is turbidity?

The CGP defines turbidity as "a condition of water quality characterized by the presence of suspended solids and/or organic material" (CGP, Appendix A). Water with low turbidity appears clear; water with higher turbidity appears cloudy or murky.

Turbidity samples must be analyzed using a turbidity meter that reports results in nephelometric turbidity units (NTUs) and conforms with an EPA-approved method under 40 CFR Part 136 (e.g., EPA Method 180.1). Compare the turbidity level in each sample to the CGP turbidity benchmark threshold to determine if corrective action is required to reduce turbidity levels in dewatering discharges.

The turbidity benchmark threshold is 50 NTUs (referred to as the "standard 50 NTU benchmark"). However, if you can demonstrate that your receiving water's water quality standard for turbidity is higher than 50 NTUs, CGP Part 3.3.2.b describes a process to request EPA approval of a turbidity benchmark for your site that is higher than the standard 50 NTU benchmark.

Benchmarks as used in the CGP are not effluent limits. Instead, a benchmark acts as a trigger to require corrective action when the weekly average of turbidity monitoring results exceeds it. Corrective actions include steps such as shutting off the dewatering discharge, investigating whether dewatering controls are operating effectively and could be the cause of the exceedance, and adjusting the controls as needed to lower the turbidity levels below the benchmark. Corrective actions are described in more detail in Section 4.

What Is a Sensitive Water?

CGP Part 3.3 defines a "sensitive water" as a receiving water that is either or both of the following:

- Impaired for sediment or a sediment-related parameter. (An impaired water is a water that a State, a Tribe, or EPA identifies as not meeting water quality standards for a specific parameter.)
- Designated as a Tier 2, 2.5, or 3 water for antidegradation purposes.

Sediment-related parameters

The CGP defines a "sediment-related parameter" as a pollutant parameter that is closely related to sediment such as turbidity, total suspended solids, total suspended sediment, transparency, sedimentation, and siltation (CGP, Appendix A).

The Federal antidegradation policy at 40 CFR 131.12 requires different levels of protection, or "tiers," for waters of the United States. For antidegradation purposes, Tier 2 waters are those waters whose quality exceeds the levels needed to support propagation of fish, shellfish, and wildlife, as well as recreation in and on the water. Tier 3 waters are Outstanding Natural Resource Waters, such as waters of national and State parks and wildlife refuges and waters of exceptional recreational or ecological significance. Some States and Tribes designate Tier 2.5 high quality waters, which require a level of protection equal to or greater than Tier 2 waters, but less than that given to Tier 3 waters.

How Do I Know If I Am Discharging to a Sensitive Water?

If you filed an NOI to obtain CGP coverage, you will have already identified your receiving waters and whether they are impaired or designated as Tier 2, 2.5, or 3 waters.

Waters impaired for sediment and sediment-related parameters are identified on each State's Clean Water Act, Section 303(d) list—that is, the list of impaired and threatened waters (e.g., stream/river segments, lakes). States submit their 303(d) lists for EPA approval every 2 years.

For each water on the list, the State identifies the pollutant causing the impairment, when known (EPA, 2021).

EPA's Stormwater Discharge Mapping Tools publishes information on waterbody impairments by segment. You can also refer to the State's 303(d) list, but you will need to know the name of the waterbody and the segment identification number. EPA's How's My Waterway? webpage is useful for identifying which waterbody segment receives discharges from your construction site.

EPA's Construction General Permit Resources, Tools, and Templates webpage provides links to a list of currently designated Tier 2, Tier 2.5, and Tier 3 waters in the areas where the CGP is in effect. You should not assume that a water does not receive Tier 2, Tier 2.5, or Tier 3 protection solely based on the absence of information contained in this list. Contact your State or Tribal authority if you need help determining whether your site discharges to a Tier 2, Tier 2.5, or Tier 3 water.

2.C Determine Where You Will Collect Samples

If your site has one or more discharge points through which treated dewatering water flows to a sensitive receiving water, each of these dewatering discharges must be sampled and analyzed for turbidity each day a discharge occurs. As previously mentioned, the SWPPP site map must identify discharge points, receiving waters, and the specific turbidity sampling locations (CGP, Part 7.2.4.g).

The CGP does not prescribe an exact sampling location for turbidity benchmark monitoring; you are responsible for identifying a safe and accessible sampling location that is representative of the discharge. (A sample is representative if it has the same physical and chemical characteristics as the dewatering discharge.) CGP Part 3.3.1.b stipulates that "[s]amples must be taken after the dewatering water has been treated by installed treatment devices…and prior to its discharge off site into a receiving water, constructed or natural site drainage feature, or storm drain inlet"—that is, before the treated dewatering water commingles with stormwater or other pollutant sources.

Note that the sampling location for turbidity benchmark monitoring may be different than the discharge point based on the configuration of the dewatering operation. However, the sampling location for a particular discharge point should be the same from sample to sample unless adverse conditions prevent safe access.

Sampling from a Pipe or Hose

If dewatering water flows from the treatment control through a pipe or hose to the discharge point, take the sample directly from the pipe or hose. Typically, a cuvette is used to collect the sample and the same cuvette is used for the analysis. This avoids having to transfer the sample from the sampling container to the cuvette for analysis.

What is a cuvette?

A cuvette is a small tube-like container with straight sides and a circular or square cross section. It is sealed at one end, and made of a clear, transparent material such as plastic, glass, or fused quartz. Cuvettes hold the sample, and the turbidity meter passes a beam of light through the sample within the cuvette to measure turbidity.

For hard-to-reach locations, you may need to fasten a collection bottle to a pole. If you take the sample in a bottle or other container, you must transfer the sample to the cuvette for analysis. Before transferring the sample, gently agitate or mix it to keep solids in suspension while transferring. (Otherwise, the transfer process can cause a turbidity result that is artificially low

and is not representative of the discharge.) Take care when transferring to the cuvette to minimize formation of air bubbles, which can cause a turbidity result that is artificially high and is not representative of the discharge.

Sampling Overland Flow

In some areas of your site, it may be difficult to obtain a sample because the dewatering discharge drains overland flow and is not deep enough to collect a sample. If the flow is too shallow to directly fill a cuvette, consider:

- Concentrating overland flow by excavating a small depression in an existing ditch or other location where stormwater runoff flows.

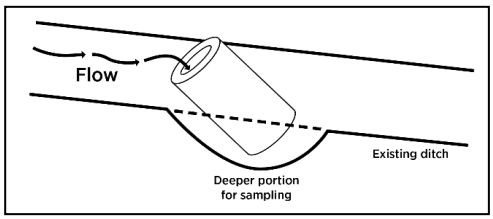

Figure 1. Sampling overland flow by deepening an existing ditch

- Installing a trough, gutter, or ditch to intercept and concentrate dewatering flow.

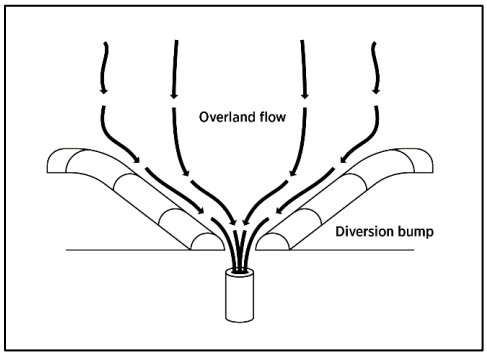

Figure 2. Sample overland flow from vegetated areas by constructing a shallow ditch to intercept the runoff and a deepened area to place bottles to catch the runoff.

- Installing "speed" bumps to convey and concentrate overland flow. A container positioned on the edge of the collection area can collect samples directly.

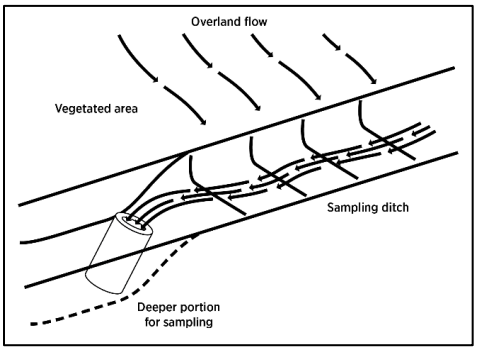

Figure 3. Sample overland flow by constructing diversion bumps to collect and concentrate the flow.

If you dig a ditch or disturb the earth in some way, line the disturbance with concrete or plastic to avoid contaminating stormwater samples with sediment or other pollutants.

Sampling from a Drainage Ditch or Swale

If dewatering water is discharged via a drainage ditch or vegetated swale, collect the sample from a consistently flowing part of the ditch/swale. If the ditch/swale is too small or shallow, install a barrier device in the channel or deepen a small area so you can sample directly into the bottles. If you dig a ditch or disturb the earth in some way, line the disturbance with concrete or plastic so that you do not contaminate your stormwater samples with sediment or other pollutants.

Sampling from a Stormwater Detention/Retention Basin

If you need to sample from a detention or retention basin, only do so at the structure's outlet and only when a discharge from the basin occurs. You are not required to conduct turbidity benchmark monitoring if the on-site basin that receives dewatering water is not discharging, but you should check the basin outlet for discharge every day dewatering is occurring. Note that if the basin receives other inflows in addition to dewatering water (e.g., stormwater), the discharge from the basin must still meet the turbidity benchmark.

Potential Sampling Issues

Potential problems for dewatering sampling include adverse weather and lack of accessibility.

- **Adverse weather.** High tides and high flow or flood conditions can make it difficult to reach the dewatering sampling location, pipes and hoses may be clogged or submerged, and dewatering treatment controls may be overloaded. You should use your best professional judgment when choosing sampling locations during adverse weather. In some cases, you may need to sample at a point before the discharge point.
- **Discharge point/sampling location is inaccessible.** Discharge points and sampling locations may not be accessible for a variety of reasons. In these instances, you may need to identify an alternate, representative sampling location. Go upstream of the dewatering sampling location until a sample can be taken. If you cannot collect a sample, make a note on your turbidity benchmark monitoring data table (see the sample in Appendix A) and take photos if possible.

2.D Select Dewatering Inspection and Monitoring Staff

Each operator, or group of multiple operators, covered under the CGP must have a "stormwater team" responsible for monitoring activities and corrective actions.[1] Section 6 of this guide provides an overview of training requirements and recommendations for stormwater team members who will inspect and monitor dewatering operations. It may be advantageous to have the person or persons performing dewatering inspections also conduct turbidity benchmark monitoring, when required. Using the same person or team for inspections and turbidity benchmark monitoring will help produce consistent, comparable samples over time.

Some permitted construction sites have one operator each; others may have multiple operators. Where multiple operators are operating on one site, they may coordinate representation on the stormwater team to avoid duplicating efforts (CGP, Part 3.3). CGP Part 7.2.8 requires that your

[1] Part 6.1 of the 2022 CGP lists which construction site staff must be represented on the stormwater team. Part 6.2 of the CGP lists the general training requirements for members of the stormwater team.

SWPPP describe any coordinating arrangement you may have with any other permitted operators on the same site for compliance with the turbidity benchmark monitoring requirements, including which parties have which specific responsibilities.

A written agreement is the best practice when stormwater compliance, monitoring, and corrective actions are shared among multiple operators. A written agreement that assigns specific monitoring responsibilities to specific members of the stormwater team, identified by operator and position, will help to make sure that dewatering inspection and turbidity benchmark monitoring activities are not missed because of communication breakdowns and will clarify each operator's monitoring responsibilities during a regulatory inspection.

2.E Select a Turbidity Meter That Meets EPA Requirements

Only purchase a turbidity meter that conforms with an EPA-approved method in 40 CFR Part 136 (e.g., EPA Method 180.1). This information should be readily available from the manufacturer or retailer.

Samples must be measured using a turbidity meter that reports results in NTUs. EPA-compliant (field or benchtop) turbidity meters comply with the methods outlined in 40 CFR Part 136. The most common approved method used for turbidity monitoring is *EPA Method 180.1: Determination of Turbidity by Nephelometry*, the standard for determining turbidity in drinking, ground, surface, waste, and seawater samples. The applicable range of EPA Method 180.1 is 0–40 NTUs, making it ideal for low-range samples. The method can be modified for higher levels of turbidity with dilution of the sample. EPA has approved other methods for turbidity.[2] Some methods are better suited for measuring higher or lower levels of turbidity; choose a method to reflect the expected level of turbidity of the dewatering discharge.

Things to look for when purchasing a turbidity meter include, but are not limited to:

- The meter complies with an approved EPA method. (This is usually highlighted by the manufacturer.)
- The meter is durable and weather-resistant if it will be used in the field.
- Calibration materials are readily available.

Potential issues with turbidity meters include:

- **Malfunctions**. If the turbidity meter malfunctions or fails to calibrate correctly, it should be repaired or recalibrated, or another sampling device should be used.
- **Turbidity sample exceeds the meter's range.** If the sample's turbidity level is outside the meter's range, refer to the manufacturer's manual. You may need to dilute the sample to obtain a result. *EPA Method 180.1: Determination of Turbidity by Nephelometry* describes how to dilute a sample to obtain a turbidity result.

[2] Standard Method 2130 B-2011, ASTM D1889-00, and USGS 1-3860-85 are also approved methods under 40 CFR Part 136.

2.F Document Dewatering Inspection and Monitoring Procedures in Your SWPPP

You must correctly document dewatering inspection and turbidity benchmark monitoring procedures in your SWPPP (CGP, Parts 7.2.7 and 7.2.8). If your site is required to conduct turbidity benchmark monitoring, the SWPPP must describe the procedures for collecting and evaluating samples, reporting results to EPA, keeping records of monitoring information, and taking corrective action when necessary. The SWPPP must identify the specific type of turbidity meter used for monitoring and all manuals or manufacturer instructions on how to operate and calibrate the meter (CGP, Part 7.2.8).

2.G Collect and Organize Inspection and Monitoring Supplies

You should make a list and collect all the supplies you will need for the required turbidity benchmark monitoring. These supplies should be stored and organized in a common location to ensure they are accessible when you need to sample. They include, but are not limited to:

- **Sampling equipment.** Ensure the turbidity meters are in working condition, calibration solutions are available and not expired, and that any other needed sampling materials (e.g., cuvettes, wipes, extra batteries) are stocked.
- **Personal protective equipment.** Hard hats, vests, safety glasses, etc., should be readily accessible on-site for inspection and monitoring activities.
- **Documentation**. Appendix A provides a sample turbidity benchmark monitoring data table.

Section 3: Conduct Inspections and Monitoring and Evaluate Results

This section addresses how to conduct dewatering inspections, perform turbidity benchmark monitoring of dewatering discharges (if required), and evaluate inspection observations and sampling results. The section covers inspection procedures, how to collect and analyze samples, and how to record the results. Recall that operators must inspect dewatering discharges every day these discharges are occurring. Turbidity benchmark monitoring must be performed every day discharges are occurring, but only for discharges to a sensitive water.

3.A Inspect Dewatering Operations

You must inspect dewatering operations once each day when dewatering water is being discharged to ensure that dewatering treatment controls are working correctly; to evaluate whether there are observable indicators of pollutant discharges; and, if so, to know whether you need to take action to correct any problems at the site or with the dewatering controls that may have contributed to the pollutant discharges. CGP Part 4.6.3.e identifies two general conditions to watch for during dewatering inspections, either of which would mean you must take corrective actions:

- A sediment plume, sheen, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam.
- A visible sheen or visible hydrocarbon or sediment deposits on the bottom or shoreline of the receiving water.

Figure 4. Dewatering discharge operations.

You should give special attention to the dewatering operation during initial setup, when the dewatering operation changes, and after major storm events. If you observe any of the pollutant indicators identified above during your inspection, you must conduct corrective action under CGP Parts 5.1.5.b and 5.2.2. Section 4 presents corrective actions to consider when you observe pollutant indicators in dewatering discharges.

CGP Part 4.6.3.f requires photo documentation of dewatering inspections. You must take photos of:

1. dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment;
2. the dewatering control(s); and

3. the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

Field personnel will also need to estimate the rate of discharge, in gallons per day (gpd), if the dewatering treatment control does not have a flow gauge. Operators may rely on the manufacturer's design pump rating for the pump model in use. For example, a pump rated at 164 gallons per minutes (gpm) by the manufacturer can be assumed to be discharging at 164 gpm in most cases. To convert to gpd, multiply the rate in gpm by 1,440 (the number of minutes in one day), resulting in a daily discharge rate of 236,160 gallons.[3] If the dewatering discharge is being pumped over long distances or a substantial distance uphill—which will result in a pump rate lower than the manufacturer's specification—the operator may improve the accuracy of the estimate by estimating the time required to fill a container of a known volume. For example, if it takes 60 seconds to fill an empty 55-gallon barrel, the estimated discharge rate is 55 gpm, or 79,200 gpd.

Refer to Section 5.A of this guide for dewatering inspection recordkeeping requirements.

Operators not subject to turbidity benchmark monitoring can skip to Section 4.

3.B Collect and Analyze Turbidity Benchmark Monitoring Samples

The protocol below outlines the appropriate steps for collecting a grab sample for turbidity benchmark monitoring. A grab sample is a single sample obtained by filling up a container directly from the source. Always wear clean, disposable, powder-free gloves during sampling activities. To avoid sample contamination, dispose of the gloves after using them once. You should refer to the turbidity meter manufacturer's instructions for details on calibrating and using your meter.

Figure 5. Turbidity sample collected in a cuvette.

- Conduct a daily calibration verification consistent with the manufacturer's instructions.
- Fill the cuvette (or other sample container) directly from the sampling location. Make sure not to set its opening on the ground, or against the mouth of the discharge point, to avoid contaminating the sample.
- If you have used a different container to collect the sample, transfer the sample to the cuvette.
    - Gently agitate or mix the sample before transferring to keep the solids in suspension during the transfer.
    - Pour the sample onto the interior wall of the cuvette to avoid bubble formation.
- Wipe the outside of the cuvette with a clean cloth or tissue and gently agitate the sample to disperse the solids before inserting the turbidity meter.

[3] The example assumes that the site is dewatering 24 hours per day. If not, use the number of minutes the pump is operating each day to calculate the daily discharge.

- Run the meter and record the result in NTUs on the sampling form, as described in Section 3.C below.
- Empty the cuvette and other sampling container (if you used one). Rinse and dry them before collecting and analyzing another sample.

If you are taking multiple dewatering samples for analysis with a benchtop turbidity meter in the trailer, be sure to properly label the containers so the sample results can be matched to each sampling location.

3.C Record Information for Each Monitoring Event

You must keep records of the following information for each turbidity sample (CGP, Standard Condition G.10.3).

- The date, time, and exact location of the turbidity sample.
- The person(s) who performed the sampling and analyses.
- The analytical techniques or methods used. For this, it is sufficient to record the make and model of the turbidity meter.
- The date and time each sample was analyzed. Note that sampling and analysis times may be the same if using a field meter, or they may be different if samples are collected and taken to a different location for analysis, such as a benchtop turbidity meter in the trailer, office, or elsewhere nearby. 40 CFR Part 136 specifies that turbidity samples must be analyzed within 48 hours of collection, which is the maximum holding time.
- The turbidity result for each sample. The CGP requires turbidity monitoring results to be rounded to the nearest whole number.

Record the required information on your monitoring data table (a sample table is provided in Appendix A).

3.D Evaluate Turbidity Benchmark Monitoring Results

The analysis of your turbidity benchmark monitoring results will determine if you must perform corrective action to reduce weekly average turbidity below the standard 50 NTU benchmark or the EPA-approved alternate benchmark for your dewatering discharges. The turbidity benchmark is not an effluent limit; rather it provides an action level that if exceeded indicates that the dewatering controls may not be working to protect water quality, in which case you must investigate and take appropriate corrective actions.

For each week that dewatering water is being discharged, you must compare the weekly average of turbidity monitoring results to the standard 50 NTU benchmark, or alternate benchmark if approved by EPA. The weekly average is calculated as the sum of the turbidity results divided by the number of samples. If you analyze more than one turbidity sample in a day, each result must be included in the weekly average calculation (Table 1). See CGP Part 3.3.3.c. For averaging purposes, a "monitoring week" starts with a Monday

Alternate benchmark thresholds

CGP Part 3.3.2.b allows you to request a turbidity benchmark that is higher than 50 NTUs if you have information showing the higher number is the same as your receiving water's water quality standard for turbidity. You must, however, use the standard 50 NTU benchmark until EPA approves an alternate benchmark.

and ends on the Sunday. Once a new monitoring week starts, you will need to calculate a new average for that week of turbidity monitoring results.

In the example shown in Table 1, the operator collected six samples within a monitoring week, with two samples taken on Friday and none taken on days when dewatering discharges did not occur. The resulting weekly average is 53 NTUs (rounded to the nearest whole number). In this case, the operator must take corrective action to reduce turbidity in their dewatering discharges because the weekly average exceeds the standard 50 NTU benchmark. See Section 4 for information on potential corrective actions.

Table 1. Example Weekly Average Turbidity Calculation, Intermittent Discharge

Day of the Week	Number of Turbidity Samples	Result (NTUs)
Monday	1	43
Tuesday	1	68
Wednesday	0	No discharge
Thursday	1	41
Friday	2	72
		48
Saturday	1	45
Sunday	0	No discharge
Weekly total	*6*	*317*
Weekly average	**—**	**53**

Similarly, if the operator only discharges dewatering water on one day during a monitoring week the turbidity result(s) from that day is the weekly average for that monitoring week, as shown in Table 2.

Table 2. Example Weekly Average Turbidity Calculation, One Sampling Event

Day of the Week	Number of Turbidity Samples	Result (NTUs)
Monday	0	No discharge
Tuesday	0	No discharge
Wednesday	0	No discharge
Thursday	1	28
Friday	0	No discharge
Saturday	0	No discharge
Sunday	0	No discharge
Weekly total	*1*	*28*
Weekly average	**—**	**28**

Section 4: Take Corrective Action

You must take corrective action if any of the following triggering conditions occurs:

- The weekly average of your turbidity monitoring results exceeds the standard 50 NTU benchmark or an alternate EPA-approved benchmark (CGP, Part 5.1.5.a).
- During dewatering discharge, you observe a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or foam (CGP, Parts 4.6.3.e and 5.1.5.b) at the point of discharge to receiving waters or to constructed or natural site drainage features or storm drain inlets.
- During dewatering discharge, you observe a visible sheen on the water surface or visible oily deposits on the receiving water's bottom or shoreline (CGP, Parts 4.6.3.e and 5.1.5.b).
- EPA, State, or local authorities inform you that your dewatering discharge or the receiving water for the discharge has visual pollution indicators described above (CGP, Part 5.1.5.b).

4.A Corrective Action Deadlines

If your inspection observations or turbidity benchmark monitoring results trigger a corrective action, you must document the triggering condition in your corrective action log within 24 hours of identifying it, as well as the date and time it was identified. (See CGP Part 5.4 and Section 5.C of this guide.) You must also do all of the following:

- Immediately take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a solution, including shutting off the dewatering discharge as soon as possible (depending on the severity of the condition and taking safety considerations into account).
- Determine whether the dewatering controls are operating effectively and whether they are causing the conditions.
- Make any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

4.B Corrective Action Options

A successful corrective action will minimize or eliminate indicators of pollutants (e.g., sediment plume or sheen) observed in dewatering discharge or, if you are required to conduct turbidity benchmark monitoring, reduce turbidity such that the weekly average is below the benchmark threshold.

Pollutant Indicators Observed During a Dewatering Inspection

Table 3 presents possible corrective actions to address inspection observations of pollutant indicators. Some of them—such as evaluating the effectiveness of the dewatering treatment control—may require the assistance of an engineer, the vendor who provided the control, or another subject matter expert.

Table 3. Corrective Actions to Consider When Pollutant Indicators Are Observed in Dewatering Discharge

Observed Pollutant Indicator	Potential Corrective Actions
Dewatering water is causing erosion between the treatment control and the receiving water.	• Stop dewatering if the downgradient area shows signs of instability or erosion. • Investigate whether channels used to convey dewatering discharges are stabilized and protected with vegetation, riprap, erosion control blankets, or a similar erosion control measure. If not, implement appropriate erosion control measures. • Move dewatering controls installed on steep slopes to a flatter area. • Install outlet protection or a velocity dissipation device. • Move the discharge location, if possible, to a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment). • Check for leaking pumps, hoses, and pipe connections and fix if identified. Leaks under pressure can be significant causes of erosion.
Pollutant indicators such as a sediment plume, suspended solids, unusual color, odor, decreased clarity, or foam are observed in or on the dewatering water discharge.	• If ongoing construction activity is identified as the pollutant source, install or maintain stormwater control measures between active construction areas and the dewatering operation to minimize the transport of sediment and other pollutants into the dewatering operation. • If the dewatering control is not operating properly, maintain the dewatering treatment control to remove accumulated sediment and other pollutants. Sediment is typically removed before storage volume is reduced by one-third. • If you observe a distinct color or odor, look for raw materials, chemicals, or other materials used or stored near the area being dewatered. Move these materials away from the dewatering operation if you determine them to be the source of color, odor, foam, or sheen. • If you observe foam, check for and clean up any leaks or spills near the dewatering operation. • Stop dewatering and evaluate whether the installed dewatering treatment control is the correct treatment control for the site. Visual turbidity may indicate that installed dewatering controls are ineffective for the soil composition or site conditions, are undersized, or were incorrectly installed. For example, sediment filtration practices

Observed Pollutant Indicator	Potential Corrective Actions
	(e.g., dewatering bag filters, silt fence enclosures, sediment traps, basins) are effective at removing larger sediment particles, but fine particles need advanced treatment technology. An undersized or incorrectly installed treatment control may result in the discharge of untreated or partially treated dewatering water. An undersized treatment control will also need more frequent maintenance than a correctly sized one.
The water surface has a visible sheen or the receiving water's bottom or shoreline has visible oily deposits.	• Check upstream and downstream of the dewatering discharge location to see if a sheen or oily deposits may be coming from a different source such as a spill or other discharge from your site or a neighboring property. • Verify that your dewatering treatment control is equipped with an oil-water separator to remove oil, grease, and other hydrocarbons. If not, add an oil-water separator to the dewatering treatment control. • If an oil-water separator is already in place, perform any necessary maintenance to ensure that it is operating properly.

Exceedances of the Turbidity Benchmark Threshold

If the weekly average turbidity result exceeds the standard 50 NTU benchmark or an EPA-approved alternate benchmark, the magnitude of the exceedance may drive your corrective action response.

For example, if the weekly average of your turbidity monitoring results is slightly above the benchmark threshold, then maintenance of treatment controls and retraining sampling and analysis personnel (to ensure that related errors are not compromising the accuracy of the results) may be enough to reduce the site's weekly average turbidity result below the threshold.

You should safely shut off the discharge if the weekly average of your turbidity monitoring results significantly exceeds 50 NTUs or a single sample is extremely high (e.g., 355 NTUs or greater). In the latter case, the weekly average turbidity value will exceed 50 NTUs regardless of the turbidity values the other days during the week. See CGP Part 5.2.2.a. Evaluate the cause of the high turbidity; you may need to install a different treatment control or additional treatment controls to reduce turbidity levels below the benchmark threshold in highly turbid dewatering water.

You should also look at the individual turbidity results. Are they similar or was the weekly average influenced by an outlier that is significantly higher or lower than the other results for the week? For example, if most of the turbidity results are around 70 NTUs, one would expect the weekly average to be around 70 NTUs—but an outlier may be influencing that average. In the Table 1 example in Section 3.D, four of the six samples were between 40 and 50 NTUs, while the other two were 68 and 72 NTUs.

You should consider the possibility of unusual events or sampling conditions. (For example, were the two high-turbidity samples shown in Table 1 taken during unusual conditions?) You should evaluate outliers across weeks to see if a pattern emerges. Note that if you try to reduce the influence of outliers on the weekly average by performing more turbidity tests, each test result must be included in the weekly average calculation (CGP, Part 3.3.3.c).

Table 4 presents possible corrective actions to consider when the weekly average of your turbidity monitoring results exceeds 50 NTUs or an EPA-approved alternate benchmark threshold. If you consistently exceed the turbidity benchmark, consider whether you can avoid discharging to a sensitive water. Depending on dewatering flow rate, climate, and regulatory requirements, you may be able to land-apply and infiltrate (unless ground water contamination could result) dewatering water on-site.

Table 4. Corrective Actions to Consider for Weekly Turbidity Benchmark Monitoring Result Exceedances

Possible Cause of Turbidity Benchmark Monitoring Exceedance	Potential Corrective Actions
Sampling and analysis errors	• Reevaluate sampling locations to ensure the samples are representative of treated dewatering water. (For example, the designated sampling location may have been inaccessible; a dewatering sample may have been taken from a different location and therefore returned an unexpected turbidity result.) • Verify that the meter was calibrated before the analysis. • Make sure the cuvette, or other sampling container, is cleaned before the sample is collected. Solids or other residual pollutants from a previous sampling event may contaminate the sample. • Clean the outside of the cuvette prior to analysis. Dirt, smears, and ink can interfere with the meter's analysis, potentially resulting in an incorrect, elevated result. Refer to the meter's manual for directions on preparing cuvettes. • Check the cuvette for bubbles in the sample. Bubbles can cause an artificially high turbidity result.
Inadequate operation or maintenance of the dewatering treatment control	• Maintain the dewatering treatment control to remove accumulated sediment and other pollutants. Sediment is typically removed before storage volume is reduced by one-third. • Replace and clean filter media used in dewatering controls when the pressure differential equals or exceeds the manufacturer's specifications (CGP, Part 2.4.7). • Evaluate whether the installed dewatering treatment control is the correct treatment control for the site. Elevated turbidity may indicate that installed dewatering controls are ineffective for the soil composition or site conditions, are undersized, or were incorrectly installed. For example, sediment filtration practices (e.g., dewatering bag filters, silt

Possible Cause of Turbidity Benchmark Monitoring Exceedance	Potential Corrective Actions
	fence enclosures, sediment traps, basins) are effective at removing larger sediment particles, but fine particles need advanced treatment technology. An undersized or incorrectly installed treatment control may result in the discharge of untreated or partially treated dewatering water. An undersized treatment control will also need more frequent maintenance than a correctly sized one.
Erosion between the dewatering treatment control and the sampling location	• Stop dewatering if the downgradient area shows signs of instability or erosion. • Investigate whether channels used to convey dewatering discharges are stabilized and protected with vegetation, riprap, erosion control blankets, or a similar erosion control measure. If not, implement appropriate erosion control measures. • Move dewatering controls installed on steep slopes to a flatter area. • Install outlet protection or a velocity dissipation device. • Relocate discharge location, if possible, to a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment). • Check for leaking pumps, hoses, and pipe connections and fix if identified. Leaks under pressure can be significant causes of erosion.

You may resume discharging from your dewatering activities after completing the relevant corrective actions, including making any adjustments, repairs, or replacements to the dewatering controls. You should consider taking photographs of corrective actions, when possible, to supplement the descriptions in your corrective action log.

Section 5: Reporting and Recordkeeping

It is important that accurate recordkeeping of dewatering inspections and turbidity benchmark monitoring become a standard operating procedure at your construction site. You need to be able to show that records of dewatering inspections and turbidity benchmark monitoring, if required, meet all permit requirements. It is always preferable to document more than less when dealing with permit compliance. Create easy-to-use logbooks for keeping track of dewatering events. Ensure that your site map is current and easy to understand. Develop simple instruction sheets for recording inspection information and turbidity benchmark monitoring activities. Your SWPPP must include these instruction sheets (CGP, Part 7.2.7.e), and you should keep copies of the sheets with the sampling equipment.

When possible, record information on standardized forms such as EPA's dewatering inspection report template and corrective action log template (both available at EPA's CGP resources, tools, and templates webpage), as well as the sample Turbidity Benchmark Monitoring Data Table in Appendix A of this guide. This will provide consistency in information reported.

If possible, regularly transfer inspection and turbidity benchmark monitoring information into databases or spreadsheets. This will provide back-up records for hard-copy logs or forms as well as provide an easy way to analyze your sampling data.

5.A Recordkeeping for Dewatering Inspections

The following information must be recorded for each dewatering inspection (CGP, Part 4.6.3):

- The inspection date.
- Names and titles of personnel conducting the inspection.
- The approximate time that the dewatering discharge began and ended on the day of inspection. If dewatering is continuous, include this information in the record.
- Estimates of the rate (in gpd) of discharge on the day of inspection. You will need to read the flow meter, or estimate flow rate, and convert gpm into gpd using the number of minutes the site was discharging dewatering water. A continuous discharge, for example, would multiply gpm by 1,440 minutes to obtain gpd. See also Section 3.A.
- Evidence of pollutants at the point of discharge, including:
    - a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam and/or
    - a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water.
- Photographs of:
    - the dewatering water before treatment by a dewatering control(s) and the final discharge after treatment;
    - the dewatering treatment control(s); and

- the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

You do not need to submit your inspection records to EPA, but you must maintain them at the permitted site, or at an easily accessible location, so that they are immediately available at the time of an on-site inspection or upon request by EPA. You must keep these records for at least three years after permit coverage is terminated or expires.

5.B Reporting Turbidity Monitoring Results

You must submit reports of your weekly average turbidity results to EPA no later than 30 days following the end of each monitoring quarter, shown in Table 5. If there are monitoring weeks in which there was no dewatering discharge, or if there is a monitoring quarter with no dewatering discharge, you must indicate this in the quarterly turbidity monitoring report.

Table 5. Monitoring Quarters and Deadlines for Reporting Monitoring Data

Monitoring Quarter	Months	Reporting Deadline
1	January 1–March 31	April 30
2	April 1–June 30	July 30
3	July 1–September 30	October 30
4	October 1–December 31	January 30

When you report your turbidity monitoring results for the quarter, you will be entering data for each monitoring week that have been given pre-assigned dates to ensure accuracy. Refer to Table K-1 in CGP Appendix K for a table of these dates.

Operators covered under the CGP submit all records and forms through the National Pollutant Discharge Elimination System Electronic Reporting Tool (NeT-CGP), including the quarterly turbidity monitoring reports, unless the applicable EPA Regional Office grants a waiver from electronic reporting. If you are granted such a waiver, you will use the Turbidity Monitoring Report Form in CGP Appendix K. Your NeT-CGP account will include the alternate turbidity benchmark if approved by EPA. You can find more information on electronic reporting at https://www.epa.gov/compliance/npdes-ereporting.

Reporting requirements for sites with multiple operators

Where multiple operators are subject to the turbidity monitoring requirements associated with the same site, and one operator has agreed to be responsible for the monitoring activities, only that operator is required to report the site's weekly average turbidity results. The operator submitting the turbidity monitoring reports must indicate that it is fulfilling the obligations of other operators covered under the permit for the same project site, and must identify the NPDES ID number(s) for all other such operators (Turbidity Monitoring Report Form, CGP, Appendix K).

5.C Corrective Action Log

You must record each corrective action related to your dewatering operations in the site's corrective action log. This log is a CGP-required record of the operator's responses to observed indicators of pollutants or turbidity benchmark exceedances (CGP, Part 5.4). Record corrective actions as follows:

- Within 24 hours of identifying the corrective action trigger, document the specific trigger and the date and time it was identified.
- Within 24 hours of completing the corrective action (in accordance with the deadlines in CGP Part 5.2), document the actions taken to address the condition, including whether any SWPPP modifications are required.
- Each entry to the corrective action log must be signed by the operator's signatory in accordance with the CGP's Standard Permit Conditions (CGP, Appendix G). The signatory may be either the person holding the position that signed the NOI for coverage under the CGP or a duly authorized representative of that person. See CGP Appendix G, Section G.11.2.

You may prepare, sign, and maintain an electronic corrective action log, instead of a paper log, if the records are:

- in a format that can be read in a similar manner as a paper record;
- legally dependable with no less evidentiary value than their paper equivalent; and
- immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. See footnote to CGP Part 5.4.3.

As mentioned previously, you may use EPA's Corrective Action Log Template, available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates, to document your corrective actions as required under CGP Part 5.4.

The corrective action log, or an up-to-date copy, must be kept at the site or at an easily accessible location, so that it is immediately available at the time of an on-site inspection or upon request by EPA (CGP, Part 5.4.3). Additionally, the operator must keep the complete corrective action log for at least three years from the date CGP coverage expires or is terminated.

Section 6: Train Personnel

Each operator, or group of multiple operators on a single site, must assemble a "stormwater team" that will carry out activities, including those related to dewatering discharges, necessary to comply with the CGP. Each stormwater team member must understand the CGP requirements (CGP, Part 6.2), including:

- The permit requirements and deadlines associated with installation, maintenance, and removal of stormwater controls and stabilization.
- The locations of all stormwater and dewatering controls on the site required by this permit and how they are to be maintained.
- The proper procedures to follow with respect to the permit's pollution prevention requirements.
- When and how to conduct stormwater and dewatering inspections, record applicable findings, and take corrective action.

Any stormwater team member who performs dewatering inspections must be a "qualified person."

Before February 17, 2023, the qualified person, or persons, must be "knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit" (CGP, Part 6.3).

Beginning February 17, 2023, all qualified persons conducting site inspections, including dewatering inspections, must:

- have completed the EPA construction inspection course developed for this permit and have passed the exam or
- hold a current valid construction inspection certification or license from a program that, at a minimum, covers the following:
    - principles and practices of erosion and sediment control and pollution prevention practices at construction sites;
    - proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites; and
    - performance of inspections, including the proper completion of required reports and documentation, consistent with the CGP's site inspection requirements (CGP, Part 6.3).

The EPA CGP construction inspection course is offered free of charge. Several private companies and some State governments and municipalities offer construction stormwater inspection training and certification, usually for a fee.

In addition to these training requirements, you should train staff responsible for turbidity benchmark monitoring in the procedures for sample collection, reporting, and recordkeeping. Trainings should be held regularly to update staff on any changes to the permit or SWPPP related to procedures for turbidity benchmark monitoring from dewatering discharges. Employees who will be responsible for turbidity benchmark monitoring should be trained on the following:

- Where to monitor.
- How to collect and analyze samples for turbidity.
- How to interpret turbidity results.
- How to keep accurate and complete records.
- How to report turbidity benchmark monitoring results to EPA.

Section 7: References

U.S. Environmental Protection Agency. (1992). *NPDES storm water sampling guidance document*. EPA 833-8-92-001.

U.S. Environmental Protection Agency. (2015). *Getting up to speed: Groundwater contamination*. EPA 625-R-93-002.

U.S. Environmental Protection Agency. (2021). *Overview of listing impaired waters under CWA Section 303(d)*.

U.S. Environmental Protection Agency. (2022). *NPDES general permit for discharges from construction activities (CGP).*

U.S. Geological Survey. 2019. *Water-quality benchmarks for contaminants*.

Appendix A: Sample Turbidity Benchmark Monitoring Data Table

Turbidity Benchmark Monitoring Data Table

Operator:	**Project Name:**
Dewatering Discharge Point ID (if multiple discharge points)**:**	**Sample Location:**
Turbidity Meter (make and model)**:**	**Test Method** (e.g., EPA 180.1)**:**

Sample Collection			Turbidity Analysis					
Name of Individual Collecting Sample	**Date**	**Time**	**Name of Individual Analyzing Sample**	**Date**	**Time**	**Meter Calibrated?**	**Turbidity Result (NTUs)**	**Notes**
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
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						☐ Yes		
						☐ Yes		