Construction & Development Effluent Guidelines
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Effluent Limitations Guidelines (ELGs)

- Technology-based standards for control of wastewater and stormwater discharges from various categories of industry
- Not risk-based, so we don't set different standards for different waterbodies – however, we can subcategorize industry
- Can be numeric standards (i.e., discharge limitations) and/or Best Management Practices (BMPs) and process changes
- Apply to direct dischargers as well as indirect dischargers (to POTWs)
- Different standards apply to new sources vs. existing sources
- ELGs are incorporated into permits and serve as the national technology "floor" for all dischargers. Where ELGs are not sufficient to meet water quality, water quality based effluent limitations may apply.

Classes of Pollutants EPA Regulates

- Toxic pollutants
  - 65 pollutants and classes of pollutants, of which 126 substances have been designated priority pollutants (defined in Appendix A to 40 CFR part 403)
- Conventional Pollutants
  - BOD
  - TSS
  - Fecal Coliform
  - pH
  - Oil and Grease
- Nonconventional Pollutants
  - Anything not designated as a conventional or toxic pollutant
  - Examples include settleable solids, ammonia, total nitrogen

Levels of Control in ELGs – Direct Dischargers

- Best Practicable Control Technology (BPT) – EPA sets BPT for conventional, toxic and nonconventional pollutants
  - Based on cost of achieving effluent reductions in relation to the effluent reduction benefits ($/lb)
  - Usually based on the average of the best performance
  - Past effluent guidelines BPT has ranged from $0.26 to $41.44 per pound (in $2008) of pollutants removed
- Best Available Technology Economically Achievable (BAT) – EPA sets BAT for toxic and nonconventional pollutants
  - Main measure is economic achievability
    - Total cost to the industry
    - Overall effect on industry's financial health (firm closures and employment losses)
- Best Conventional Pollutant Control Technology (BCT) – BCT replaces BAT for conventional pollutants
  - Under BCT, estimate cost/pound to remove conventional pollutants and compare that to what it costs a POTW ($0.92/lb in $2008)
  - If $/lb is cheaper than POTW, then BCT can be more stringent than BPT or BAT
- New Source Performance Standards – EPA sets NSPS for all classes of pollutants
  - Based on best available demonstrated control technology
  - Main economic test is barrier to entry

Background – Existing Regulations

- EPA regulates stormwater runoff from construction sites through National Pollutant Discharge Elimination System (NPDES) permits
- EPA issues permits in some states (EPA Construction General Permit, or CGP) – most states have their own permits
- All construction sites over 1 acre are required to obtain permits
- Many states also have regulations addressing construction site stormwater runoff
- Most permits require that erosion and sediment controls be installed and maintained, but don't contain specific performance requirements. Design manuals contain detailed specifications.
- Some states (Washington, Oregon, Vermont) have numeric action levels for pollutants such as turbidity and require monitoring
- Some watersheds (Lake Tahoe) and waterbodies require dischargers to meet numeric effluent limits for turbidity or other pollutants

Why an Effluent Guideline?

- EPA is required by the Clean Water Act (CWA) to identify categories of dischargers that have not been covered by an ELG
- EPA publishes a biennial plan listing these industries (304(m) plan)
- EPA listed construction and development stormwater discharges in its 2000 effluent guidelines plan, identifying both temporary discharges during construction and long-term stormwater discharges
- EPA published a proposed rule in 2002 that would establish effluent guidelines for construction site stormwater discharges
- EPA withdrew this proposal in 2004, stating that the existing program was adequate
- EPA removed construction and development from the 2004 plan
- EPA was sued by environmental groups and states over our failure to promulgate an ELG for this category
- Court found that EPA has a mandatory duty to promulgate ELGs for categories identified in its effluent guidelines plan
- Court ordered EPA to propose ELGs and NSPS regulations by December 1, 2008 and finalize rule by December 1, 2009

How to Develop ELGs for Stormwater?

- What erosion and sediment control requirements should be minimum standards for construction sites nationwide?
- Are numeric standards feasible? If so, for what technologies or control approaches? What pollutants should be targeted?
- What monitoring requirements should the guideline contain?
- What are the pros and cons of various approaches?
- What are the costs and economic impacts of various approaches?
- How will national regulations integrate with existing state and local programs?

Applying ELGs to Stormwater Discharges

- Scope
  - Active construction stormwater discharges only
- Identify potential pollutants to regulate
  - TSS (BPT, BCT)
  - Settleable solids and/or or turbidity (BPT, BAT)
- BPT – what is average of the best performance?
  - Few states have numerics, so BPT is likely BMPs.
- What is BAT for construction site discharges?
  - Are Numeric standards feasible for settleable solids and/or turbidity?
    - Yes – Advanced Treatment Systems (polymer clarification plus filtration) demonstrate that a turbidity limit can be consistently met for some sites.
  - What about other technologies?
    - Perhaps for passive treatment, but at a higher NTU limit (but also lower cost). Little data available on which to base performance. Variability greater than ATS.
  - Is ATS economically achievable? Yes, for some construction sites but likely not for all. How do we define for which sites it is economically achievable?
  - Are passive treatment systems economically achievable? Probably yes for most sites.
  - Are numerics feasible for all sites? Maybe not – multiple discharge points, sheet flow. Some sites are in/adjacent to water bodies. Some sites are on difficult/steep terrain, some have bedrock preventing excavation. Economics of every project are different.

Applying ELGs to Stormwater Discharges

- Are action levels feasible?
  - Probably so because several states have them. Are they an effluent guideline? Maybe not.
- Can EPA set a limit that's tied to receiving water turbidity?
  - Not sure we can legally do this.
- What is NSPS?
  - Not sure from practical standpoint that NSPS is different than BAT for construction industry, but court order requires us to establish NSPS. So, NSPS is the same as BAT from a technology standpoint.
  - NSPS requires a NEPA review for each source. So, need to define NSPS as narrowly as possible.

Proposed Effluent Guidelines

- BPT = BMPs based on EPA CGP w/ some enhancements
- BAT = Numeric turbidity limit based on ATS for some sites, BMPs for other sites. Taking comment on setting a higher turbidity limit (perhaps 50 – 200 NTUs) based on passive treatment.
- BCT = BPT
- NSPS
  - NSPS only applies if you are constructing a facility that is covered by another effluent guideline. Example – constructing a new steel mill, pharmaceutical manufacturing facility, organic chemical plant
  - Logic is that NSPS (and hence NEPA) already applies to these facilities, so additional burden of NEPA review is minimal
  - This allows us to minimize scope of NEPA and still meet court order to promulgate NSPS

Erosion Control Requirements

- Stabilize disturbed soils immediately when earth disturbing work has temporarily or permanently ceased and will not resume for a period exceeding 14 calendar days.
- Control stormwater volume and velocity within the site to minimize soil erosion.
- Minimize the amount of soil exposed for the duration of the construction activity as well as at any one time during the construction activity.
- Control stormwater discharges, including both peak flowrates and total stormwater volume, leaving the site to prevent channel and streambank erosion and erosion at outlets.
- Preserve topsoil and natural vegetation.
- Minimize soil compaction by construction equipment

Erosion Control Requirements

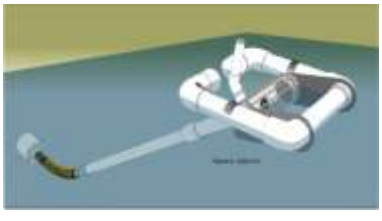
- Provide and maintain natural buffers around surface waters.
- Minimize the construction of stream crossings.
- Sequence/phase construction activities to minimize the extent and duration of exposed soils.
- Minimize disturbance of steep slopes.
- Implement erosion controls specifically designed to prevent soil erosion on slopes.
- Establish temporary or permanent vegetation, such as grass or sod, or use non-vegetative controls such as mulch, compost, geotextiles, rolled erosion control products, polymers or soil tackifiers to stabilize exposed soils.
- Divert stormwater that runs onto the site away from disturbed areas of the site.

Sediment Control Requirements

- Establish and maintain perimeter control measures for any portion of the down-slope and side-slope perimeter where stormwater will be discharged from disturbed areas of the site.
- Discharge stormwater from perimeter controls through vegetated areas and functioning stream buffers.
- Control discharges from silt fences using a vegetated filter strip or vegetated buffer at least six feet in width.
- Minimize the length of slopes and install linear sediment controls along the toe, face and at the grade breaks of exposed and erodible slopes.
- Establish, use and maintain stabilized construction entrances and exits. Install, utilize and maintain wheel wash stations to remove sediment from construction equipment and vehicles leaving the site.
- Remove any sediment and other pollutants, including construction materials, from paved surfaces daily Establish, use and maintain controls and practices to minimize the introduction of sediment and other pollutants to storm drain inlets.
- Control sediment and other pollutants from dewatering activities

Sediment Basin Requirements

- Sediment basins designed to provide storage of 3,600 cf/acre or runoff from 2-year, 24-hour storm
- Additional 1,000 cf/acre of sediment storage volume required
- Required for all sites with 10 or more acres of disturbed land draining to one location
- Dewatering though a skimmer or other outlet that withdraws water from the surface
- Dewatering time of at least 72 hours (or as designated by permit authority)
- Permitting authority can allow alternate, but equivalent controls



Pollution Prevention Requirements

- Prohibit the discharge of construction wastes, trash, and sanitary waste in stormwater;
- Prohibit the discharge of wastewater from washout of concrete, stucco, paint, and cleanout of other construction materials;
- Prohibit the discharge of fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
- Prohibit the discharge of pollutants resulting from the washing of equipment and vehicles where soaps or solvents are used;
- Prohibit the discharge of pollutants resulting from the washing of equipment and vehicles;
- Implement measures to minimize the exposure of stormwater to building materials, landscape materials, fertilizers, pesticides, herbicides, detergents, and other liquid or dry products. Implement appropriate chemical spill prevention and response procedures. Any spills and leaks that do occur shall be immediately addressed in a manner that prevents the discharge of pollutants.
- Prevent stormwater runoff from contacting areas with uncured concrete to minimize changes in stormwater pH.

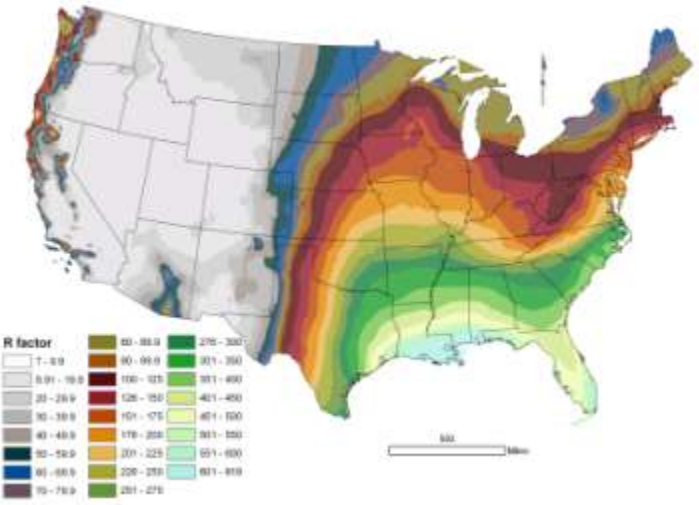
Turbidity Limit

- Turbidity limit of 13 NTUs applies to sites of 30+ acres with R-factor ≥50 and ≥10% clay content for all discharges up to the 2-year, 24-hour storm
- Limit is a daily maximum
  - Limit is not an increase over background
  - Taking comment on allowing short-term values to be above limit
- Annual precipitation threshold of 20 inches can be used instead of R-factor in areas where data is not available (such as Alaska)
- Soil clay content (≥10% by mass of particles < 2 microns) can be determined from soil surveys or sampling of soils on-site; requesting comment on appropriate approaches
- Technology basis is chitosan-enhanced sand filtration
  - Permittees can use any technology to meet the limit
  - Can use zero discharge (such as infiltration, discharge to buffers)

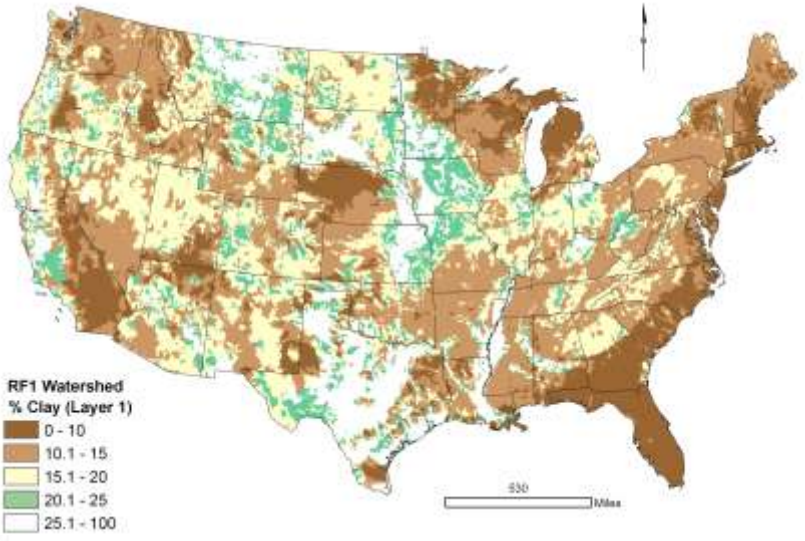
Turbidity Limit Calculation

- Data based on 19 ATS systems located in CA, WA and OR
  - 466 individual turbidity measurements
  - Average NTU = 3.7
  - Median NTU = 2.07
  - Minimum NTU = 0.08
  - Maximum NTU = 38.75
- Calculate a Long-Term Average based on statistical evaluation of data
  - LTA = 2.77 NTU
- Calculate variability factor, which accounts for variation in system performance
  - VF = 4.58
- Limit = LTA X VF = 13 NTU
- EPA may collect additional ATS system data prior to final rule

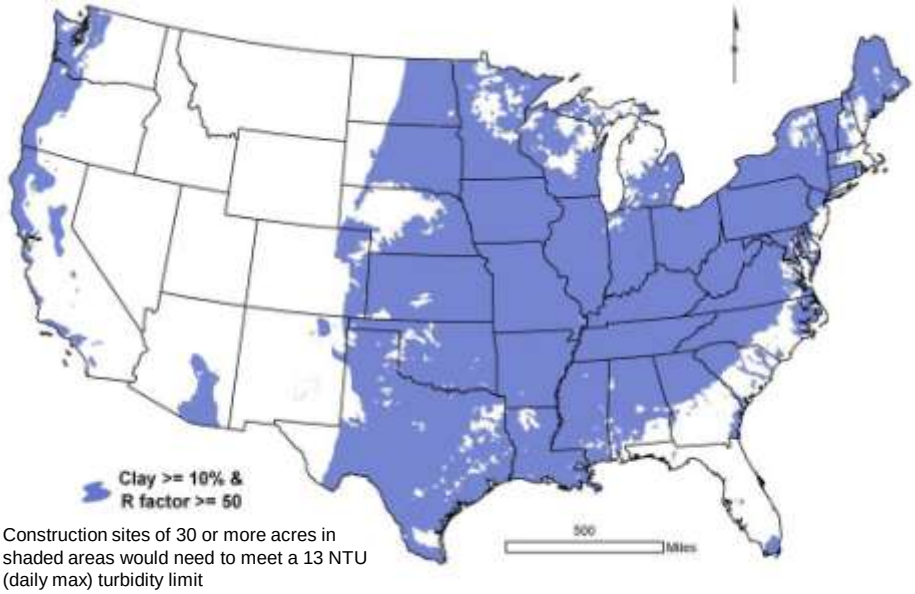
National Map of R-Factors



National Map of Surface Soil % Clay

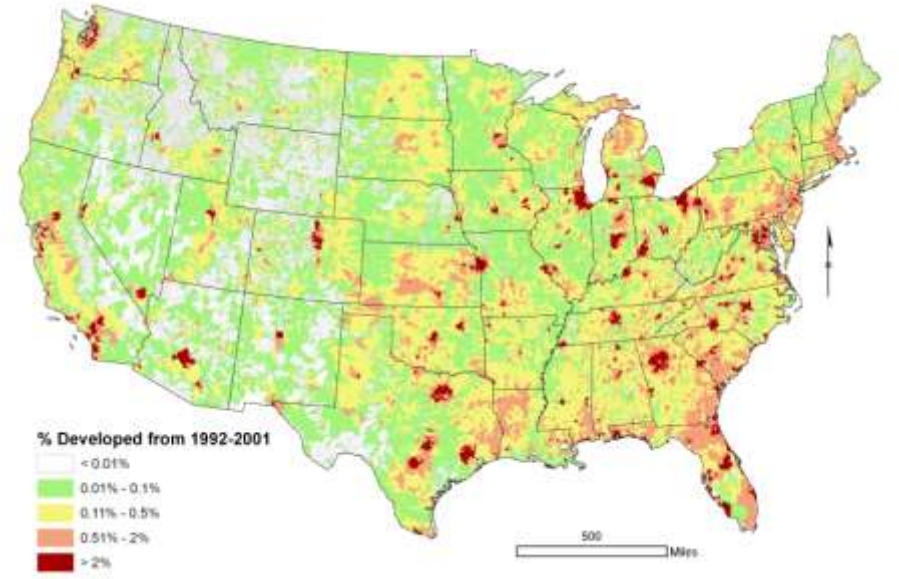


Turbidity Limit National Coverage



Construction sites of 30 or more acres in shaded areas would need to meet a 13 NTU (daily max) turbidity limit

U.S. Development Trends



Proposed Rule Coverage and Economic Impacts

- BMP requirements apply to entire country – about 590,000 acres per year
- Numeric turbidity standard applies to about 234,000 acres per year, or about 40% of annual development acres
- Of the approximately 269,000 firms in the construction and development industry, we estimate that approximately 81,600 would be subject to requirements of the proposed rule
  - 53,500 in residential sector
  - 22,400 in non-residential sector
  - 5,700 in street and highway construction
- Annual costs, once fully implemented, of $1.9 billion
- We estimate 147 firms (0.2% of in-scope firms) may incur financial stress and 103 potential firm closures (0.1% of in-scope firms)
- Potential employment impacts to 11,400 jobs (0.1% of in-scope firm employees)

Schedule

- Proposed rule published in the Federal Register November 28, 2008
- 90 day public comment period ends February 26, 2009
- Response to comments, re-analysis of options, update cost and economic impacts: Spring/Summer/Fall 2009
- Must publish final rule by December 1, 2009
- Effective 90 days after publication in Federal Register
- EPA and States must incorporate requirements into permits within 5 years of effective date – full implementation expected by early 2015

Summary of Comments Received

- Turbidity limit – should be based on background, not a strict effluent limit
- Costs of ATS are too high – not economically achievable
- Sediment basins should not be specified – allow permitting authorities to determine appropriate design
- Soil stabilization requirements are too stringent
- Turbidity limit should be based on conventional BMPs and/or passive treatment – higher limit, but applied to more sites
- Availability of ATS – sufficient market does not exist to meet demand
- Polymer toxicity of concern – need to incorporate requirements for operator training/certification. What is more toxic – sediments from construction sites or polymers?
- Additional energy/emissions due to active treatment
- Linear projects ability to meet numeric limit due to multiple discharge points
- How to sample to demonstrate compliance – what about sheet flow?
- Low impact development stresses distributed controls. Requiring basins or storage for ATS is a disincentive to better site design.

Areas EPA is Likely to Evaluate for Final Rule

- Economics
  - Economic analysis completed in 2008 based largely on 2006 and earlier data. Does not reflect current economic downturn.
  - Determination of what is economically achievable is likely to change
- Site size threshold – current turbidity limit is for sites 30+ acres
  - May evaluate different site size threshold
  - May evaluate total disturbed acres or acres disturbed at once vs. total site size
- R-factor threshold – current threshold is annual value of ≥50: may evaluate other thresholds
  - Seasonal R-factor
  - Rain on snow/spring thaw effects on R-factor
- Annual Precipitation – may evaluate using annual precipitation instead of R-factor
- Linear projects (pipelines, roads/highways, sewers, utilities) – may evaluate different requirements for linear projects due to ROW concerns

Areas EPA is Likely to Evaluate for Final Rule

- Turbidity limit – may collect additional data on ATS and passive treatment technologies, which may impact the turbidity limit. May have a turbidity limit apply more broadly if technically feasible and sufficient data is available to characterize performance of passive treatment. Variability is an issue.
- Turbidity limit based on conventional BMPs? Possible we may consider this. Data and variability is an issue.
- Phased implementation – possible we may evaluate phasing in a turbidity limit with applicability to larger sites first and smaller sites in future.
- BMP language – need to determine what belongs in national rule vs. discretion of permitting authority. Are all of the requirements proposed feasible? Will they conflict with existing state/local requirements? Will specific language limit innovation?

More Information

C&D Web Page
http://www.epa.gov/waterscience/guide/construction/

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