



Washington State Specific Local Limits Development & Validation Guidance

David J. Knight P.E.

June, 2016

Guidance Manual for Developing Local Discharge Limits

📄 Ecology Pub 11-10-056, June 2011 (17pp)

1. Intent and References
2. Local Limits Development Process
3. What Triggers Local Limit Development
4. Ways to Develop Local Limits
5. Electronic Tools
6. Applying and Maintaining Limits

Intended Audience for Policy:

- ☞ All POTWs developing or modifying Local Limits should obtain Ecology approval.
- ☞ Ecology has 403.10(e) authority & issues permits to SIU's outside Delegated POTWs
- ☞ Ecology requires POTWs with & without pretreatment programs to develop and codify local limits for Pretreatment permits.

Section II – Development Process

Regulatory Background:

- Federal Pretreatment Regulations
- NPDES Permit Rules
- Ecology's Delegated Program

Purpose of Local Limits

Relation to Other Pretreatment Standards

- Categorical Standards
- AKART
- Discharge Prohibitions

Regulatory Background:

- 📄 Ecology developed program in 1986 where:
- 📄 POTWs must develop and codify local limits – Ecology plan is to include such requirements in NPDES permits.
- 📄 Ecology Rules Require (173-216 WAC) all Non-domestic Wastewater Sources Apply for & SIU's obtain permits.
- 📄 Local Limits are included in such permits.

Purposes of Local Limits

- ☞ Prevent “Pass through” and “Interference”
- ☞ “Pass Through” is a discharge which exits the POTW and thus amenable to MAHL.
- ☞ “Interference” can occur in the collection system, or at the POTW.
- ☞ Impose the Specific Prohibitions found at 40CFR403.5(a)&(b) and 173-216-060 WAC

National v.s. Local Limits

COMPARISON	Categorical Stds.	Local Limits
Done By:	EPA (Promulgated)	POTW or Control Authority
Goal:	National Standards for Pollutants from Industry	Protect POTW, Meet Pretreatment Goals
Basis:	Reasonable Treatment For Particular Waste	Needed Protections for specific POTW
Pollutants:	Specifically Listed (Usually Priority Poll)	Any Pollutant you Need & can defend limit for
IU's Covered:	Industries Listed in 40CFR 405-471	Categories of Users Defined in Ordinance
Flow Covered:	Wastewater from Specific Regulated Process(es)	Flows to which loadings allocated

Section III – When to Develop

☞ With Program Development

☞ When serving SIU's (new or existing) but no existing Local Limits

☞ When experiencing any of these:

- Pass through (including failure of WET test)
- Interference (including collection system)
- Operational Problems
- Higher sludge pollutant levels

National POCs (c. 2004)

Arsenic	Lead	Molybdenum
Cadmium	Mercury	Selenium
Chromium	Silver	BOD ₅
Copper	Nickel	TSS
Cyanide	Zinc	Ammonia

Prohibition Based Local Limits:

- 📄 Explosion & Vapor Toxicity (EPA Manual)
- 📄 BPJ: Solids, Grease, & TPH
- 📄 Interference: Salts, TDS, Drilling Mud
- 📄 Corrosion: $5.0 < \text{pH} < 11.0$, Sulfate
- 📄 Compatible pollutants $>$ POTW capacity
- 📄 Discharges must first apply AKART
- 📄 DW Prohibition at 173-303-090

Washington State Prohibitions:

- 📄 Discharge in violation of Ch. 173-303 WAC
- 📄 Public nuisance or prevents entry to sewer
- 📄 Injurious in any way to POTW or workers
- 📄 Wastewater pH > 11.0 unless designed for it
- 📄 ORDINARILY PROHIBITED: (173-216-060(2)(b)(vii))
 - (A) Significant flows of noncontact cooling water.
 - (B) Stormwater & other direct inflow sources.
 - (C) Wastewaters significantly affecting system hydraulic loading but either not requiring or receiving significant treatment by the POTW.

HW Prohibitions - WAC 173-303-090(8)(c)

📄 Arsenic = 5.0mg/L

📄 Cadmium = 1.0mg/L

📄 Chromium = 5.0mg/L

📄 Lead = 5.0mg/L

📄 Mercury = 0.2mg/L

📄 Selenium = 1.0mg/L

📄 Silver = 5.0mg/L

Prohibitions (mg/L) 173-303-090(c) - Continued

Barium 100.0	Benzene 0.5	Carbon tetrachloride 0.5
Chlordane 0.03	Chlorobenzene 100.0	Chloroform 6.0
o-Cresol 200.0	m-Cresol 200.0	p-Cresol 200.0
Cresol /1/ 200.0	2,4-D 10.0	1,4-Dichlorobenzene 7.5
1,2-Dichloroethane 0.5	1,1-Dichloroethylene 0.7	2,4-Dinitrotoluene 0.13
Endrin 0.02	Heptachlor&epoxide 0.008	Hexachlorobenzene 0.13
Hexachlorobutadiene 0.5	Hexachloroethane 3.0	Lindane 0.4
Methoxychlor 10.0	Methyl ethyl ketone 200.0	Nitrobenzene 2.0
Pentachlorophenol 100.0	Pyridine 5.0	Tetrachloroethylene 0.7
Toxaphene 0.5	Trichloroethylene 0.5	2,4,5-Trichlorophenol 400.0
2,4,6-Trichlorophenol 2.0	2,4,5-TP (Silvex) 1.0	Vinyl chloride 0.2

IV – How to Develop Limits

General Methodology

Develop List for Initial Screening

- Pollutants with WQ Criteria detected at POTW
- Conventional Pollutants (BOD, TSS, NH₃+4)
- Chemicals used by indirect dischargers
- General Chemistry
- Pollutants found in receiving waters
- Potential WET test concerns

Candidate Pollutants of Concern (POCs) must include:

- ☞ Identified National POC's (15)
- ☞ Priority Pollutants in Effluent Scans
- ☞ Conventional Pollutants
- ☞ Pollutants used by Local Industries
- ☞ General Chemistry Compounds
- ☞ Pollutants w/Receiving Waters Impairments
- ☞ Pollutants Limited in NPDES Permit
- ☞ Pollutants that caused Problems at POTW

IV – Conduct Initial Screening

POTW Influent and Effluent

- Needed for Mass balance & Removal Rt.

Biosolids to Disposal

- Needed for 503 based limits & Mass balance

Primary Clarifier Effluent

- Needed for Primary Rem Rt.

Activated Sludge (Compare to Inhibition Levels)

Domestic Only (Background)

SIU's and Hauled Waste


Receiving Waters (ambient background)

IV – Evaluate Initial Screening

 Evaluate Data Quality

 Compare Influent results to criteria

 Compare Influent results to “Domestic”

 Decide if a second round of screening is needed to get final POC list.

IV – Determine Final List of Pollutants of Concern

- 📄 Ecology Guidance reference Ch 3 of EPA's 2004 manual for greater detail.
- 📄 Decide if POC's for additional monitoring need to include parameters for which “end-of-pipe” limits are traditionally codified (e.g. pH, FOG, TPH, vapor toxic, explosive)
- 📄 Decide if POC's need to include compatible pollutants

Develop a Monitoring Plan

Parameter	INFLUENT	EFFLUENT	SLUDGE	AMBIENT
National POC	8	8	8	8
Local POC	8	8	8	8
Compatible	BPJ	BPJ	BPJ	BPJ

 **Two per quarter for four quarters**

 **Allow for hydraulic retention times**

 **Calculate %removal each sample pair**

 **Use average of %removal of data pairs**

IV–Sample Pollutants of Concern

📄 Ecology QAPP Guidance online @

📄 <https://fortress.wa.gov/ecy/publications/documents/0403030.pdf> (pp 12-41)

📄 **Set quality objectives (Ch.6)**

📄 **Sampling process design (Ch.7)**

📄 **Sampling & analysis decisions (Ch.8&9)**

📄 **Confirming / controlling quality (Ch.10)**

📄 **Tabulating all relevant data (Ch. 11)**

Also Collect POTW Data Needed for Limits Analysis

- **Flow & Pollutant Treatment Capacities**
- **POTW Influent Data & Removal Rates**
- **Flows to POTW and portion from IU's**
- **NPDES Permit Limits & mixing zones**
- **Loading Capacity of Receiving Waters**
- **Sludge Disposal Method**
- **Protect Worker Health and Safety**

IV – Analyze the Data Quality

- ☞ See if sampling provided usable data.
- ☞ Estimate Pollutant Concentrations & Removal Rates (typically averages)
- ☞ For removal rates - use decile method?
 - **NO** if site specific removal data is used.
 - **YES** if you don't have site specific data.
- ☞ **For Pollutant Concentrations – Is using Average values conservative enough?**

IV-Determine Allocation Method

☞ Unique to Ecology Guidance (v. EPA manual):

☞ **AHLs for Conventional Pollutants**

☞ Treatment capacity must be divided between “Domestic” + “Commercial”, and “Industrial” (each with own “reserve”)

☞ **BOD, TSS, & Ammonia**

- Find “Design Capacity” in NPDES permit
- Make pie chart with domestic, IU, reserves
- Manage loadings using tools:
 - Capacity Charges (allocates % POTW cap)
 - Surcharges (to pay for capacity used)

V – Using Spreadsheet Tools

- 📄 Enter Basic Data about POTW & Monitoring Data
- 📄 Determine Analysis Methodology
- 📄 Calculate limits under various scenarios, e.g. amount of loading in reserve, etc.

Allocate the MAIL

THREE METHODS SEEN IN WASHINGTON:

- ❖ **Uniform Concentration Method (Either):**
 - One limit for all POTWs. OK if lowest limit chosen.**
 - Separate limits for each POTW (if more than one exist)**
- ❖ **IU Contributory Flow (Each Poll. Eff. Data for ALL SIUs)**
- ❖ **Tiered Limits (Typically: higher flows get lower limit)**

METHODS YOU ARE UNLIKELY TO EVER SEE:

- 📄 **Mass Proportional – “What You Have Is What You Get”**
- 📄 **WYNIWYG – Industries buy / negotiate needed loadings.**
- 📄 **Already over MAIL? - Selected Industrial Reduction**

Set Averaging Period for Limits

Maximum Daily / Daily average

- Value for specific “day”
- Apply to: metals, toxics, prohibitions


Instantaneous maximums

- To allow grab samples when inspecting (when compositing req'd)

Monthly averages

- (Only use for conventional)

VI – Consolidate and Codify

 Add limits from the spreadsheet (primarily for conservative pollutants) to limits reflective of AKART, Collection System Protection, FOG Program, and Surcharge Programs.

Scope: Types of Local Limits

- **Toxic Pollutant Allocations (of MAHL)**
- **Compatible Pollutant Allocations**
- **Prohibition Based (flammability, grease, temperature, pH, etc.)**
- **Best Management Practices (BMP) Based – including for Minor Users**
- **End-of-process limits (e.g. silver, OWS)**
- **Permits may also have User specific limits**

Evaluate Proposed Limits

- ☞ How much above background are the indicated new local limits?
- ☞ Are IU's meeting the new limits now?
- ☞ Is the treatment needed to meet limits possible? Is it reasonable?
- ☞ If not, review "facts" and assumptions
- ☞ Review alternative strategies for allocating the MAIL.

Add Compatible Pollutants

Compatible Pollutants have Design Capacity, above which system fails.

Example: 5.0MGD POTW designed to treat 250mg/L influent rated at 10,400 lb/d BOD and 2,800 lb/d Ammonia – N

Effluent concentration is not a linear function of influent concentration like it is for conservative pollutants.

Important To Keep in Mind

- ☞ POTWs designed for BOD, TSS, NH₃, pH, some O&G (Compatible Pollutants).
- ☞ Treatment of Metals (& other conservative POC's) across a POTW is incidental.
- ☞ Presumption: If treatment of compatible pollutants is consistent, removal for metals will be too.
- ☞ Effluent TSS & Metals increases linked

Removal Rate Misleading for Conventional Compatible Poll's

BOD5 Removal Rate v. Implied MAHL

92.4% - 8,230

93.4% - 9,477

94.4% - 11,170 (107% of design cap.)

95.4% - 13,598 (131% of design cap.)

96.4% - 17,375 (168% of design cap.)

97.4% - 24,058 (231% of design cap.)

Add the “End Of Pipe” Limits

- ☞ **Goal: Protect the collection system.**
- ☞ **Scope: Address “reasonable treatment”, Worker Protection, specific prohibitions & compliance with other laws.**
- ☞ **Pollutants: FOG, TPH (non-Polar FOG), pH, Sulfate, TDS, explosivity, HW toxicity & OSHA toxicity.**
 - Levels to protect sewer lines
 - Applied to all discharges at end of pipe
- ☞ **Dangerous Waste Discharge Prohibition**
 - 173-303-090(c) WAC

Local Limits Package contents

NOTE: Interpreted from EPA Presentation, not in WDOE Policy Document

- Sampling/data collection plan (QAPP)
- Evaluation of whether data quality objectives were met.
- Sampling locations, dates, sample type, preservation, and analysis methods.

Local Limits Package (2/4)

- POTW discharge limits & requirements
- Sludge disposal methods
- Headworks & worker health & safety issues
- POTW's compliance record
- Rationale for determining POCs
- Initial Characterization Results
- Pollutants eliminated from limits & why

Local Limits Package (3/4)

- Summary of all sample data collected:
 - *Domestic only, *Industrial, *Influent, *Primary Eff, *Effluent, *Biosolids, & *Receiving Water)
- Plant, Domestic, and Industrial flow rates
- Sludge flow rates to digester & disposal and percent solids
- Removal Efficiencies

Local Limits Package (4/4)

- Formulas used (Removal rate, AHL, MAIL)
- Allocation method chosen for each pollutant
- Table of current and proposed local limits
- Describe how local limits will be applied
- Supporting information as necessary
- **NOTE: Data in spreadsheet already, doesn't need to be duplicated.**

Approval by WDOE & City

- 📄 Process to Modify Approved Program
- 📄 Satisfy NPDES Permit (non-del)
- 📄 Update Ordinance (local, political process)
- 📄 Both Processes require Public Involvement / Notice
- 📄 * Include specific notice to all affected IU's, both those with a permit, or who now may need one.
- 📄 * Set the schedule to update permits with new limits

Updating / Reassessment

Why Done:

- To satisfy NPDES Permit / App.
- To address new POC's (or new/lower criteria)
- To address changes to POTW, POTW Loadings, Industries Served

How Done:

- Compare Present and Past Loading to MAHL
- Review Pollutant Scans for New Pollutants

Human Health Stds Revision

- ☞ Pollutant from 6/29/15 FR (National HHC Update)
- ☞ Pollutants from 10/28/15 FR (EPA Proposed Updates of HHC for Washington State)
- ☞ <https://www.gpo.gov/fdsys/pkg/FR-2015-09-14/html/2015-22592.htm>
- ☞ Maine HH Criteria Update 4/11/2016

Local Limited Metals Cross/Ref

📄 EPA's latest proposed HHC update for WA:

📄 Thallium = .048ppb (v. 1.7 ppb)

📄 Antimony = 2.5ppb (v. 14 ppb),

📄 Arsenic = .0045ppb (v. 0.018 ppb),

📄 Methylmercury (tissue) .033 mg/Kg (new)

📄 PCB's = 7.3×10^{-6} (v. 1.7×10^{-4} ppb)

📄 BEHP = 0.045 ppb, (v. 1.8 ppb)

📄 Benzene = 0.44ppb (v. 1.2ppb)