



Government of **Western Australia**
Department of **Water and Environmental Regulation**

Consultation paper:

Review of the uncontaminated fill thresholds in Table 6 of
the *Landfill Waste Classification and Waste Definitions 1996*
(as amended 2018)

Department of Water and Environmental Regulation
November 2018

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Purpose

The [Environmental Protection Amendment Regulations 2018](#) were gazetted and the revised [Landfill Waste Classification and Waste Definitions 1996 \(amended 2018\)](#) (Waste Definitions) published on 27 April 2018. The amendments allow for the use of clean fill, or uncontaminated fill that meets environmental and health thresholds after testing, without the need for a landfill premises licence or payment of the waste levy.

Following publication of the of the revised Waste Definitions, questions have been raised regarding the basis for the derivation of the thresholds for uncontaminated fill, as set out in Table 6, and the potential for ambient background concentrations of some parameters to exceed the thresholds.

The Department of Water and Environmental Regulation (DWER) is conducting a review of the thresholds in Table 6 of the Waste Definitions in consultation with industry stakeholders.

The purpose of this paper is to:

- seek nominations for a stakeholder reference group
- establish the terms of reference for the review
- provide guidance for the process to submit ambient background data
- explain the basis for the derivation of the current thresholds.

This consultation and review process relates to the thresholds (maximum concentration values) for uncontaminated fill set out in Table 6 of the revised Waste Definitions. This review does not focus on the broader Waste Definitions and waste regulation framework, for example a risk-based case-by-case approval system, which is the subject of separate legislative reviews. These proposed changes will be subject to separate consultation.

Consultation

DWER welcomes stakeholder comments and the submission of data to support the review of the thresholds for uncontaminated fill.

Written submissions are encouraged from industry stakeholders and interested community members. To ensure that your submission is as effective as possible, please:

- support your response with evidence and your reasons
- if data are being submitted, observe the minimum requirements for data submission set out in section 2.4.

Please note that by making a written submission you are consenting to your submission being treated as a public document. Your name will be published; however your contact address will be withheld for privacy. If you do not consent to your submission being treated as a public document, you should either mark it as confidential, or specifically identify the parts that you consider confidential, and include an explanation.

DWER may request that a non-confidential summary of the material is also given. It is important to note that, even if your submission is treated as confidential by the Department, it may still be disclosed in accordance with the requirements of the *Freedom of Information Act 1992*, or any other applicable written law.

The department reserves the right before publishing a submission to delete any content that could be regarded as racially vilifying, derogatory or defamatory to an individual or an organisation.

Written submissions must be received by 5pm (WST) on 18 January 2019.

Submissions may be lodged by email (preferred) to contaminated.sites@dwer.wa.gov.au or hard copies can be mailed to:

Senior Manager, Contaminated Sites

Department of Water and Environmental Regulation

Locked Bag 33

CLOISTERS SQUARE WA 6850

1 Introduction

The Environmental Protection Amendment Regulations 2018 gazetted on 27 April 2018 address the consequences of the decisions of Justice Beech and the Court of Appeal in *Eclipse Resources Pty Ltd v the State of Western Australia* [No. 4] [2016] WASC 62 and *Eclipse Resources Pty Ltd v The Minister for Environment* [No 2] [2017] WASCA 90 (Eclipse case).

These amendments allow for the use of clean fill, or uncontaminated fill that meets environmental and health thresholds after testing, without the need for a landfill premises licence or payment of the waste levy. Further information on the amendments, including frequently-asked questions, is available in the factsheet [*Amendments to the Environmental Protection Regulations 1987 – clean fill and uncontaminated fill*](#).

The amendments are only relevant to material that is defined as waste under the *Environmental Protection Act 1986* (EP Act) and *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) as interpreted by the Eclipse case, and for premises classified as a landfill category (63, 64, 65, 66 and 89) in the EP Regulations. Further information on considerations for determining whether material is waste is available in the factsheet [*Assessing whether material is waste*](#).

The WARR Act includes objectives that preference reuse and recycling to divert waste from landfill consistent with the waste hierarchy. The amendments to the EP Regulations and Waste Definitions support this by allowing for the use of clean fill, or uncontaminated fill that meets environmental and health thresholds after testing, without the need for a landfill premises licence or payment of the waste levy.

1.1 Uncontaminated fill

Uncontaminated fill includes inert waste type 1 (excluding asphalt and biosolids) and neutralised acid sulfate soils that meet the requirements set out in Table 6 of the Waste Definitions, as determined by relevant sampling and testing carried out in accordance with the requirements in Table 7 of the Waste Definitions.

The testing thresholds are intentionally conservative. Maximum concentration and leaching test thresholds allow for the use of uncontaminated fill at any location without increasing the risk to human health, the environment or any environmental value. This includes on the highly transmissive soils of the Swan Coastal Plain near Perth with its vital groundwater resources and wetlands. Available data on ambient background levels in soils of the Swan Coastal Plain were taken into account when setting thresholds.

It is not necessary to test for every substance listed in Table 6. The testing and sampling regime (Table 7) in the Waste Definitions allows for testing for substances based on land use history of the site of origin for uncontaminated fill. This ensures that only likely contaminants are tested for, reducing the cost and complexity of the testing regime.

The sampling and testing requirements are based on achieving a 95% upper confidence limit (average) and the requirement to characterise each domain or stockpile separately. This ensures that only testing of relevant substances is undertaken, and that the results are practical in their application. Records to be maintained should include the originating site/s historic activities, the tested contaminants and testing results.

It is the responsibility of the user to ensure that the material is environmentally suitable for the purpose for which it is being used, including whether its use could be pollution, or an unreasonable discharge under the EP Act or create a contaminated site within the meaning of the Contaminated Sites Act 2003.

1.2 Derivation of the thresholds

The maximum concentration and leaching test levels in Table 6 were developed to facilitate the use of waste material at any location without increasing the risk to human health, the environment or any environmental values at that location. The thresholds were developed with consideration of published generic risk-based criteria for the assessment of contaminants in the environment. These published criteria are derived based on available toxicological data and set at levels below which adverse effects to human health, the environment or any environmental value would not be expected. The source and base assumptions used for the development of the maximum concentration threshold for each relevant parameter in Table 6 are provided in Appendix A.

It is acknowledged that several of the threshold values were derived from screening risk assessment levels. The indiscriminate use of screening levels from the contaminated sites regime is not appropriate as these are not intended for decisions about waste reuse suitability. Schedule B1 of the National Environment Protection (Assessment Site Contamination) Measure (1999) (ASC NEPM) clarifies that investigation and screening levels do not reflect desirable soil quality criteria, and the use of these levels in regulating the application of wastes to soil is inappropriate.

Ambient background levels

The thresholds in Table 6 were developed having regard to available data representative of ambient background levels within the Swan Coastal Plain. Limited data were available for consideration, noting that the majority of soil data held by DWER relate to the assessment of contaminated sites regulated under the *Contaminated Sites Act 2003* and are therefore largely not reflective of ambient background conditions.

Sources of data which were considered include:

Prakongkep, N., Gilkes, R.J., Singh, B. and Wong, S. 2011 "*Mineralogy and chemistry of sandy acid sulphate soils in the Perth metropolitan area of the Swan Coastal Plain*". Report to Department of Environment and Conservation, June 2011.

Olszowy, H, Torr, P & Imray, P 1995, *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia*, Contaminated Sites Monograph Series no. 4,

Department of Human Services and Health, Environment Protection Agency & South Australian Health Commission (WA data in Part II).

Available data from Main Roads Western Australia's Gateway WA project (see Appendix B)

A key component of this review process is expected to be the consideration of a more comprehensive dataset for ambient background levels than that available before the Waste Definitions were published.

2 Review of Table 6

2.1 Parameters for review

The review is of the threshold values for uncontaminated fill presented in Table 6 of the Waste Definitions. Based on feedback from industry stakeholders prior to and after the publication of the Waste Definitions, it is anticipated that the review will primarily consider the maximum concentrations for metals. However, respondents are encouraged to identify the parameters that should be considered during the review and briefly explain the rationale for the review of that parameter.

Question 1

What parameters should be considered during the review process and why?

2.2 Stakeholder group

The review of the thresholds will be undertaken by DWER in consultation with an industry stakeholder group. All information considered by DWER during the review will be provided to the stakeholder group for consideration. The stakeholder group will meet, together with relevant DWER officers, at key milestones during the review.

In order to establish the group, nominations are sought from industry representatives. If you wish to nominate yourself, or a member of your organisation, please do so in writing by **16 November 2018**. Nominations must be lodged by email to contaminated.sites@dwer.wa.gov.au.

Approximately twelve representatives will be selected from a variety of industry areas. Preference will be given to representatives with relevant industry experience and/or demonstrated technical knowledge in areas such as risk assessment, waste reuse and soil science.

2.3 Review process

Base thresholds

As shown in Appendix A, the current thresholds were set based on published generic risk-based criteria from national and international sources. The review will consider submissions relating to the currency and appropriateness of the criteria used to derive the thresholds. For example, the underlying risk-based criterion used to derive a threshold value may have been modified, such as due to scientific advances relating to the toxicological behaviour of the parameter, since the Waste Definitions were published.

Question 2

What sources should be used to identify generic risk-based criteria from which to derive thresholds for uncontaminated fill?

Ambient background levels

Since the publication of the Waste Definitions several stakeholders have commented that the maximum concentration values for some parameters may be lower than typically encountered in natural soils of the Swan Coastal Plain. Parameters highlighted include metals such as nickel, chromium (III), copper and zinc. As noted previously, limited data relating to ambient background levels were available at the time the Waste Definitions were published. DWER is therefore seeking the submission of data representative of ambient background conditions to be used in the review of the thresholds. Minimum data submission requirements are set out in section 2.4. The data will be assessed by DWER to ensure they are representative, i.e. verify that the data have originated from a location that has not been subject to potentially contaminating activities. Statistical analysis of the data will then be undertaken with the intention of developing an accepted set of values representative of typical ambient background concentrations for relevant parameters in soils of the Swan Coastal Plain for the parameters of interest.

The review process will include the derivation of a draft set of thresholds based on relevant national and international risk-based screening criteria, which will then be adjusted such that no threshold is lower than the corresponding adopted ambient background concentration.

Data must be submitted to DWER by **18 January 2019**.

Data submissions must be lodged by email to contaminated.sites@dwer.wa.gov.au.

Question 3

Do you have data that are representative of typical ambient background conditions for soils of the Swan Coastal Plain? If yes, please refer to the minimum data submission requirements.

2.4 Submission of ambient background data

Stakeholders are encouraged to submit data to support the review of the thresholds. Data are sought that are representative of ambient background conditions within the Swan Coastal Plain. This means that data from locations that have been subject to a potentially contaminating activity or land use (such as market gardens) would not be valid. The parameters of interest are expected to be primarily naturally occurring metals such as copper, zinc and nickel. DWER also welcomes the submission of data relating to any of the parameters specified in Table 6 of the Waste Definitions. Data from across the whole of the Swan Coastal Plain are encouraged to be submitted in order to build a comprehensive dataset. For the purpose of this review, the Swan Coastal Plain is defined as the area bound by the Indian Ocean to the west, Darling Scarp to the east, Geraldton in the north and Dunsborough to the south.

To ensure that data are reliable for the purposes of the review, the following minimum requirements for data submission apply:

- Data must be provided in an appropriate digital format (e.g. Excel spreadsheets).
- Data must be supported by relevant background information to demonstrate that the site to which the data relate has not been subject to potentially contaminating activities or land uses, and is not located in a highly mineralised area. The site must be clearly identified using current cadastral details. Examples of potentially contaminating activities include, but are not limited to, those specified in Appendix B of [*Assessment and management of contaminated sites*](#) (Department of Environment Regulation, 2014).
- Data must be accompanied by relevant supporting documentation, such as but not limited to laboratory certificates demonstrating that analysis was undertaken by a NATA accredited laboratory, and evidence that appropriate field quality assurance and quality control procedures were adopted during the sampling program. Discussion should be provided regarding the precision, accuracy or bias, representativeness, completeness, and comparability of the data having regard to the guidance provided in Schedule B2 of the ASC NEPM.

In addition to the above requirements, it is preferable for data to be provided without significant superfluous information (such as colour coding denoting exceedances of screening risk assessment criteria).

Given the role of the stakeholder group in the review process, it will not be possible to use confidential data submissions. It is the responsibility of the person or organisation submitting the data to ensure that they are authorised to do so (taking any commercial, contractual and/or intellectual property considerations into account).

3 Expert review

The review will be overseen by qualified and experienced technical experts. It is expected that two experts will be identified from academia and/or the environmental consulting industry, such as contaminated sites auditors accredited outside of Western Australia. Experts will be selected based on technical expertise in areas such as risk assessment, soil science and waste re-use. To ensure the independence of the expert review, experts actively operating in Western Australia will not be considered.

The expert review will consider all information used by DWER and the stakeholder group in developing amended thresholds. The expert reviewers will each assess the proposed thresholds, and the method by which they were derived, and report on their appropriateness and provide recommendations as necessary.

4 Timing

Expected timing for undertaking the review is provided in Table 1 below.

Table 1: Review timing

Task / milestone	Date
Correspondence to stakeholders and content regarding the review added to the department's website	Early November 2018
Deadline for nominations to stakeholder group	16 November 2018
Initial stakeholder group meeting	Late November 2018
Identification and engagement of technical experts	November 2018
Submission period closes	18 January 2019
Data review and analysis	January–February 2019
Second stakeholder group meeting	February 2019
Finalise proposed amendments to thresholds	1 March 2019
Expert review of proposed amendments and derivation process	March 2019
Review complete and report to Minister for Environment	April 2019

Appendices

Appendix A – Derivation of current thresholds

Parameter	Maximum Concentration mg/kg, dry weight	Source document (see list of references below table)
Metals & metalloids		
Antimony	20	1 (based on Soil Quality Guideline [SQG] for residential / parkland)
Arsenic	20	2b (based on Ecological Investigation Level (EIL) for 'fresh' contaminant sources in areas of ecological significance)
Barium	200	3 (rounded, based on Ecotoxicological Serious Risk Addition values [SRA _{ECO}])
Beryllium	2	3 (rounded, based on SRA _{ECO})
Cadmium	1	4 (based on absolute maximum concentration)
Chromium III	30	2b (based on EIL for 'fresh' contaminant sources, minimum clay content of 2.5 % and ambient background of zero in areas of ecological significance)
Chromium VI	1	5 (based on EIL)
Cobalt	15	3 (based on SRA _{ECO})
Copper	50	2b (based on EIL for 'fresh' contaminant sources, pH of 6 cation exchange capacity of 10 cmol _c /kg, and ambient background of zero in areas of ecological significance)
Lead	110	2b (based on EIL for 'fresh' contaminant sources in areas of ecological significance)
Manganese	500	5 (based on EIL)
Mercury (inorganic)	0.5	4 (based on maximum average concentration for characterisation)
Molybdenum	40	5 (based on EIL)
Nickel	10	2b (rounded, based on EIL for 'fresh' contaminant sources, cation exchange capacity of 10 cmol _c /kg and ambient background of zero in areas of ecological significance)

Parameter	Maximum Concentration mg/kg, dry weight	Source document (see list of references below table)
Selenium	1	1 (based on SQG for residential / parkland)
Silver	20	1 (based on SQG for residential / parkland)
Thallium	1	1 (based on SQG for residential / parkland)
Tin inorganic	50	1 (based on SQG for residential / parkland)
Uranium	25	1 (rounded, based on SQG for residential / parkland)
Vanadium	25	3 (based on SRA _{ECO})
Zinc	50	2b (adjusted upwards, based on EIL for 'fresh' contaminant sources, pH of 6 and cation exchange capacity of 10 cmol/kg and ambient background of zero in areas of ecological significance)
Other Inorganics		
Asbestos	No numerical limit	
Sulfate	2500	6 (based on maximum concentration for plaster)
cyanides	50 complexed 10 free	5 (based on EIL)
fluoride	400	1 (based on SQG for residential / parkland)
Organic Compounds		
Benzene	0.5	4 (based on absolute maximum concentration)
Toluene	10	2a (based on Ecological Screening Levels [ESL] for coarse soils in areas of ecological significance)
Ethyl benzene	2	2a (rounded, based on ESL for coarse soils in areas of ecological significance)
Xylene (total)	2	2a (rounded, based on ESL for fine soils in areas of ecological significance)
Total recoverable hydrocarbons (C ₆ -C ₁₀)	45	2a (based on Health Screening Level [HSL] for shallow soils in low to high density residential areas)
Total recoverable hydrocarbons (>C ₁₀ -C ₁₆)	25	2a (based on ESL for areas of ecological significance)
Total recoverable hydrocarbons (>C ₁₆ -C ₃₄)	300	2a

Parameter	Maximum Concentration mg/kg, dry weight	Source document (see list of references below table)
		(based on ESL for coarse soils in urban residential and public open space)
Total recoverable hydrocarbons (>C ₃₄ -C ₄₀)	2800	2a (based on ESL for coarse soils in urban residential and public open space)
Naphthalene	3	2a (based on HSL for shallow soils in low to high density residential areas)
Benzo[a]pyrene	1	2a (rounded, based on ESL for areas of ecological significance)
Carcinogenic polycyclic aromatic hydrocarbons (PAHs) as BaP TEQ (8 species)	3	2a (based on Health Investigation Levels [HIL] for residential areas with accessible soils)
Total PAHs (16 species)	300	2a (based on HIL for residential areas with accessible soils)
Phenol	1	5 (based on EIL for total phenols)
PCBs	1	2a (based on HIL for residential areas with accessible soils)
Pesticides		
DDT+DDD+DDE	3	2b (based on EIL for fresh DDT for areas of ecological significance)
Physical		
pH (pH units)	5.5-8.5	Revised to better reflect ambient soil conditions in response to consultation submissions. Acid sulfate soils can be treated (neutralised) before comparison with this range.

1. Canadian Council of Ministers of the Environment 2014, *Environmental Quality Guidelines*. <http://st-ts.ccme.ca/en/index.html>
- 2a. *Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)*. <https://www.legislation.gov.au/Details/F2013C00288>
- 2b. *Schedule B5c – Guideline on Ecological Investigation Levels for Arsenic, Chromium (III), Copper, DDT, Lead, Naphthalene, Nickel & Zinc, National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)*. <https://www.legislation.gov.au/Details/F2013C00288>
3. Van Vlaardingen, P L A, Posthumus, R, & Posthuma-Doodeman, C J A M 2005, *Environmental Risk Limits for Nine Trace Elements*, RIVM report 601501029/2005. <https://www.rivm.nl/bibliotheek/rapporten/601501029.pdf>
4. New South Wales Environment Protection Authority 2014, *The Excavated Natural Material Order 2014* <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/waste/rro14-excavated-natural-material.pdf?la=en&hash=726FDE7971279C4C583806464CF503B5CB06E73B>

5. Department of Environment and Conservation 2010, *Assessment Levels for Soil, Sediment and Water* [https://www.der.wa.gov.au/images/documents/your-environment/contaminated-sites/guidelines/2009641 - assessment levels for soil sediment and water - web.pdf](https://www.der.wa.gov.au/images/documents/your-environment/contaminated-sites/guidelines/2009641_-_assessment_levels_for_soil_sediment_and_water_-_web.pdf) [Superseded]
6. New South Wales Environment Protection Authority 2014, *The Recovered Aggregate Order 2014* <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/waste/rro14-aggregate.pdf?la=en&hash=24FDF5D724F45D65BECDF2BB1AA0791A41B3E6C8>

Appendix B – Data from Main Roads Western Australia's Gateway WA project

Gateway WA

Gateway WA Alliance, Perth Airport



	Metals													
	Arsenic	Barium	Beryllium	Cadmium	Chromium (III+VI)	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Vanadium	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	5	10	1	1	2	2	5	50	5	5	0.1	2	5	5
WA DEC 2010 EIL	20	300		3	1	50	100		600	500	1	60	50	200

LocCode	Sample Depth Range													
SMd LT006B	0.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMd LT006B	3.25	<5	<10	<1	<1	<2	<2	<5	100	<5	<5	<0.1	<2	<5
SMd LT006B	8.5	<5	<10	<1	<1	<2	<2	<5	90	<5	<5	<0.1	<2	<5
SMd LT006B	9.5	<5	<10	<1	<1	<2	<2	<5	170	<5	<5	<0.1	<2	<5
SMd LT015B	0.25	<5	<10	<1	<1	<2	<2	<5	160	<5	<5	<0.1	<2	<5
SMd LT015B	3.25	<5	<10	<1	<1	<2	<2	<5	1320	<5	<5	<0.1	<2	<5
SMd LT015B	6.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMd LT015B	9.5	<5	<10	<1	<1	<2	<2	<5	210	8	<5	<0.1	<2	<5
SMd LT021B	0.5	<5	<10	<1	<1	<2	<2	<5	50	<5	<5	<0.1	<2	<5
SMd LT021B	1.5	<5	<10	<1	<1	<2	<2	<5	60	<5	<5	<0.1	<2	<5
SMd LT021B	4.5	<5	<10	<1	<1	<2	<2	<5	70	<5	<5	<0.1	<2	<5
SMd LT022B	0.25	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMd LT022B	3.25	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMd LT022B	6	<5	<10	<1	<1	<2	<2	<5	130	<5	<5	<0.1	<2	<5
SMd LT022B	9.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMd LT026B	0.75	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMd LT026B	5.5	<5	<10	<1	<1	<2	<2	<5	850	<5	<5	<0.1	<2	<5
SMd LT026B	6.5	<5	<10	<1	<1	<2	<2	<5	740	6	<5	<0.1	<2	<5
SMd LT026B	11.5	<5	<10	<1	<1	<2	<2	<5	280	<5	<5	<0.1	<2	<5
SMs LT003B	0.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT003B	4.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT003B	5.5	<5	<10	<1	<1	<2	<2	<5	180	5	<5	<0.1	<2	<5
SMs LT003B	7.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT007B	1	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT007B	3.25	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT007B	5.5	<5	<10	<1	<1	<2	<2	<5	600	9	<5	<0.1	<2	<5
SMs LT007B	7.5	<5	<10	<1	<1	<2	<2	<5	310	<5	<5	<0.1	<2	<5
SMs LT020B	0.25	<5	<10	<1	<1	<2	<2	<5	240	<5	<5	<0.1	<2	<5
SMs LT020B	5.5	<5	<10	<1	<1	<2	<2	<5	410	<5	<5	<0.1	<2	<5
SMs LT020B	7.5	<5	<10	<1	<1	<2	<2	<5	60	<5	<5	<0.1	<2	<5
SMs LT020B	9.5	<5	<10	<1	<1	<2	<2	<5	130	<5	<5	<0.1	<2	<5
SMs LT025B	1	<5	<10	<1	<1	<2	<2	<5	150	<5	<5	<0.1	<2	<5
SMs LT025B	5.5	<5	<10	<1	<1	<2	<2	<5	3340	<5	<5	<0.1	<2	<5
SMs LT025B	7.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT025B	9.5	<5	<10	<1	<1	<2	<2	<5	60	<5	<5	<0.1	<2	<5
SMs LT031B	0.75	<5	<10	<1	<1	<2	<2	<5	190	<5	<5	<0.1	<2	<5
SMs LT031B	5.5	<5	<10	<1	<1	<2	<2	<5	90	8	<5	<0.1	<2	<5
SMs LT031B	6.5	<5	<10	<1	<1	<2	<2	<5	110	11	<5	<0.1	<2	<5
SMs LT031B	7.5	<5	<10	<1	<1	<2	<2	<5	60	<5	<5	<0.1	<2	<5
SMs LT032B	0.75	<5	<10	<1	<1	<2	<2	<5	440	42	<5	<0.1	<2	<5
SMs LT032B	3.5	<5	<10	<1	<1	<2	<2	<5	700	<5	<5	<0.1	<2	<5
SMs LT032B	5.5	<5	<10	<1	<1	<2	<2	<5	90	<5	<5	<0.1	<2	<5
SMs LT032B	7.5	<5	<10	<1	<1	<2	<2	<5	230	<5	<5	<0.1	<2	<5
SMs LT033B	0.5	<5	<10	<1	<1	<2	<2	<5	810	<5	<5	<0.1	<2	<5
SMs LT033B	2.5	<5	<10	<1	<1	<2	<2	<5	2320	<5	<5	<0.1	<2	<5
SMs LT033B	5	<5	<10	<1	<1	<2	<2	<5	1280	5	<5	<0.1	<2	<5
SMs LT033B	7.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT034B	0.25	<5	<10	<1	<1	<2	<2	<5	60	<5	<5	<0.1	<2	<5
SMs LT034B	1.25	<5	<10	<1	<1	<2	<2	<5	80	<5	<5	<0.1	<2	<5
SMs LT034B	5.5	<5	<10	<1	<1	<2	<2	<5	130	6	<5	<0.1	<2	<5
SMs LT034B	7.5	<5	<10	<1	<1	<2	<2	<5	60	5	<5	<0.1	<2	<5
SMs LT035B	0.75	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT035B	2	<5	<10	<1	<1	<2	<2	<5	180	<5	<5	<0.1	<2	<5
SMs LT035B	5.5	<5	<10	<1	<1	<2	<2	<5	230	9	<5	<0.1	<2	<5
SMs LT035B	7.5	<5	<10	<1	<1	<2	<2	<5	190	8	<5	<0.1	<2	<5
SMs LT036B	1	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT036B	4.25	<5	<10	<1	<1	<2	<2	<5	1480	<5	<5	<0.1	<2	<5
SMs LT036B	5.5	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5
SMs LT036B	7.5	<5	<10	<1	<1	<2	<2	<5	160	<5	<5	<0.1	<2	<5
SMs LT040B	0.5	<5	<10	<1	<1	<2	<2	<5	360	<5	<5	<0.1	<2	<5
SMs LT040B	1.5	<5	<10	<1	<1	<2	<2	<5	1720	<5	<5	<0.1	<2	<5
SMs LT040B	8	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5

Statistical Summary														
Number of Results	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Number of Detects	0	1	0	0	28	0	0	45	12	0	0	1	7	0
Minimum Concentration	<5	<10	<1	<1	<2	<2	<5	<50	<5	<5	<0.1	<2	<5	<5
Minimum Detect	ND	10	ND	ND	2	ND	ND	50	5	ND	ND	3	5	ND
Maximum Concentration	<5	10	<1	<1	10	<2	<5	3340	42	<5	<0.1	3	21	<5
Maximum Detect	ND	10	ND	ND	10	ND	ND	3340	42	ND	ND	3	21	ND
Average Concentration	2.5	5.1	0.5	0.5	2.6	1	2.5	340	4	2.5	0.05	1	3.4	2.5
Median Concentration	2.5	5	0.5	0.5	1	1	2.5	120	2.5	2.5	0.05	1	2.5	2.5
Standard Deviation	0	0.64	0	0	2.3	0	0	599	5.3	0	0	0.25	3.1	0
Number of Guideline Exceedances	0	0	0	0	62	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances (Detects Only)	0	0	0	0	28	0	0	0	0	0	0	0	0	0

Area = 'LT' And Sample_Type = 'Normal' AND

Chem_Group = 'Metals'

Prepared by jstegen 19/07/2013

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