## Home & Garden

The goal of the Home & Garden Program within THE Plan is to prevent and reduce health risks from exposure to lead and smelter metals in the home and yard environment. Specific goals are:

* to prevent people’s, and particularly young children’s and pregnant women’s, exposure to lead in their home and yard environments
* to inform the community, and particularly expectant families and families with young children, about the potential health risks from lead and other smelter metals in the home & yard environment
* to engage the community, and particularly expectant families and families with young children, in addressing potential health risks from lead and other smelter metals in the home and yard environment
* to prevent health risks from exposure to soil in the community.

The Home & Garden Program works towards these goals through the following main approaches:

* Community Program Office
* Healthy Homes Program
* Residential Soil Assessment and Remediation
* Home Renovation Support Program
* Other Residential Assessment and Remediation Projects
* Parks & Playgrounds (to go to Parks and Wildlands)

### Each of these approaches is described in detail below.

### Community Program Office

* Provide information, advice and support for residents regarding health risks from metals in soil
* Provide instructions and facilitate laboratory access for residents submitting their own soil samples (typically garden soil) for analysis

### Healthy Homes Program

### Residential Soil Assessment & Remediation

Assessment

* Soil assessment is prioritized for Trail and Rivervale residents to prevent and reduce health risks from exposure to metals that may be present in yard and garden soil. Top priority is expectant families, families with children age 3 and under, and families with children who have measured blood lead levels above the Family Health case management thresholds. Second priority is vegetable gardens. Third priority is yard assessment of targeted blocks of properties close to the smelter.
* Yard soil assessment is offered to every expectant family and family with children 3 years and under living in Trail and Rivervale. This is part of the Healthy Homes Program (see xx above).
* Vegetable garden soil assessment is available upon request for residents in Trail and Rivervale.
* Yard soil assessment is offered in a targeted manner to residents of city blocks in areas close to the smelter and where it is suspected that soil metal levels may exceed remediation action levels (see remediation section below). Assessment is offered to residents on a block-by-block basis each year, depending on available resources.
* People outside Trail and Rivervale can request soil sampling, which are considered on a case-by-case basis. These requests are typically low priority as other communities are likely to have soil metal concentrations below remediation action levels.
* Residential soil assessment generally takes place between April and November when the ground is snow-free. The soil assessment process includes:
* signed consent from property owner to conduct assessment;
* site reconnaissance visit: on-site inspection of property conditions, sketch and photographs of property, and interview with property owner/tenant re. metals contamination issues;
* soil sample collection: shallow soil samples (up to 0.15 m. below grade) are collected from across the property including key areas such as bare soil, sandboxes and vegetable gardens. Deeper soil samples are collected on a case-by-case basis when screening indicates high metal concentrations or in situations where it is suspected that metals may be present in soil for reasons other than aerial emissions.
* soil screening: All soil samples are screened with an XRF machine for preliminary information about metal levels.
* laboratory analysis: approximately 2-3 soil samples from each property are submitted for laboratory analysis. This typically includes the highest sample, the median and any samples from vegetable gardens.
* quality assurance/control measures: One of every 10 samples sent to the lab is a duplicate sample (one sample split into two) to evaluate laboratory precision. Occasionally, replicate samples (two samples taken from the same location) are submitted to verify sample accuracy/representation. Other quality assurance measures include calibration of the XRF machine, sterilization of field equipment, XRF certification and field training for all assessment personnel.
* data interpretation: For yard assessments, the XRF screening readings are correlated with the laboratory results and the 95% upper confidence limit of the mean is calculated for each property. For vegetable gardens, the laboratory result is the measure used to compare with remediation action levels.
* records: all property information is tracked and managed through the THE database
  + reporting: Assessment results letters are provided to property owners following the assessment work and a summary letter is submitted to Teck after the assessment season is complete. Assessment results are reviewed with property owners where properties qualify for remediation as well as for all families participating in the Healthy Homes Program or receiving Family Health case management.

Remediation

Residential properties qualify for remediation where the soil assessment results exceed established remediation action levels (see glossary). The action levels have been established using a risk-based approach, as follows:

* for vegetable gardens, the action level is 1,000 ppm lead;
* for whole yards, the action level in 5,000 ppm lead. This corresponds Upper Cap Concentrations in Protocol 11 of the BC Ministry of Environment, Contaminated Sites Regulation.
* for yards where expectant families or children age 3 and under are present, remediation is determined on a case-by-case basis to address potential risks from exposure to bare soil (even at levels below the established action levels).

Properties are prioritized for remediation to prevent or minimize health risks. (Why do we only have action levels for lead? What did the HHRA determine?) If soil is well covered, the risks are negligible. Health risks come from exposure to bare soil and the main health risks are to young children. (Is there a good reference?)

Top priority is properties with expectant families or families with children under age 3. This includes family homes, daycares and homes of extended family and other caregivers where children spend a significant amount of time. In these situations, remediation is provided:

* if the UCLM is above the whole yard action level, the entire yard will be remediated
* if the UCLM is below 5,000 ppm lead, partial remediation is provided case-by-case to minimize risks from exposure to bare soil on the property. In these situations, the remediation plan is determined based on the soil assessment results in conjunction with a visual assessment of ground conditions and land use. This includes areas of poor ground cover or bare ground in drip zones, play areas, parking areas, pathways, patios, as well as vegetable and flower gardens. In these cases, the remediation typically consists of removing existing surface soil and ground cover and replacing it with better ground cover. The objective is to prevent young children’s potential exposure to metals in the soil.

Second priority is vegetable gardens requested by Trail and Rivervale residents. Vegetable gardens are prioritized in order to prevent ingestion of metals in produce and bare soil. (Need HHRA reference.) Where lead concentrations are above 1,000 ppm, the garden is remediated to a depth of 60 centimeters.

Third priority is whole yards. Where the UCLM for the property exceeds 5,000 ppm lead the yard is remediated to a depth of 30 cm. across the property.

In situations where 1 or more soil assessment results is > 5,000 ppm, the following additional steps take place prior to developing the remediation plan:

* develop a map of lead concentrations in soil to determine the area of soil that exceeds the High Risk Site Classification in Protocol 11 of the BC Ministry of Environment’s Contaminated Sites Regulation;
* run additional soil analysis to determine levels of leachable metals for soil disposal

The remediation process involves:

* obtaining a remediation consent from the property owner and developing a remediation plan in consultation with the property owner/tenant and remediation contractor;
* Initiating remediation based on scheduled list of properties
* Submitting regulatory documentation to the BC Ministry of Environment, Land Remediation Branch Site Advisor. This includes the Notification of Independent Remediation (NOIR), Site Risk Classification Reports, a completed Exposure Pathway Questionnaire, a survey plan and copy of the land title. For High Risk Sites (as determined in Protocol 11, CSR), this also includes a map of metals concentrations in the soil (as per Protocol 12, CSR).
* For High Risk Sites; providing site reclassification documentation signed by an approved professional to change the high-risk designation on the Site Registry to either non-high risk or risk-managed high risk.
* Notification of the MoE– For remediation work being completed on a residential property, a notification of independent remediation is submitted to the Ministry of Environment. (note that notification is not provided for gardens or partial remediation work such as ground cover improvement).
* Remediation work is completed by a remediation contractor hired by Teck. Consent from the property owner is required prior to any remediation work. A remediation plan is developed with the property owner to define the scope of work planned.
* Remediation includes;
  + ground cover improvement and partial remediation for properties, soil excavation, disposal and replacement to a depth of 60 cm in vegetable gardens and 30 cm in full yards. Deeper excavation may be required where soil exceeds 5,000 mg/kg lead at 30 cm below surface.
* Soil disposal: Additional analytical testing is required prior to soil disposal. Analysis of leachable metals is completed for soil greater than 5,000 mg/kg lead. Soil below the leachate standards is hauled to Teck Metals Landfill. Soil which exceeds leachate standards is hauled for reprocessing at the Teck Metals Trail Operations.
* Remediation soil monitoring: Soil samples are collected from the base of any excavations. Following soil replacement, surface soil samples are collected to ensure quality of the replaced soil. Records related to the remediation and soil results collected during and after the remediation are recorded in the THE Database.
* Re-landscaping of remediated areas such as cover replacement of sod, rock, and plants
* Results of the remediation are provided to the property owner and to Teck. An update to the MoE on the completion of the remediation is submitted. If the property was classified as high risk, then a letter to re-classify the property as non-high risk is requested.
* Long term Soil Study: A study to monitor metals concentrations on remediated yards and vegetable gardens over time is being carried out. The study started in 2010 and it will likely take a number of years to determine the level to which soil metal concentrations are changing.
* Describe basis for 5000 and 1000 mg/kg targets
* Long Term Soil Study (what is it and how does it tie in)
* Produce sampling etc. Did the HHRA produce screening values for comparison?
* Grass Clipping assessment (what is it and how does it tie in?)
* Information and Advice about Soil

### Healthy Home Program

* Overview of program - soil assessment to prioritize properties for remediation based on the presence of young children, both for Case Management (where BLL are elevated), and for Primary Prevention (to prevent elevated BLL from occurring)
* Lead paint testing (is this offered only to our PP and CM families or is it offered to anyone receiving the HRSP services?)
* Collaboration with Family Health Program - describe

### Home Renovation Support Program

* Overview of program only. Details provided…….
* Communication and outreach to increase public awareness of program.
* Supplies, equipment provided. Education/information.
* Connect to BC1Call, Building Permits in the appropriate place
* Make sure that the description responds to the following recommendation made after the 2010 consultation: “Given strong public support but low awareness of this program, it is a priority to conduct more extensive promotion of the Home Renovation Support Program. This includes expanded outreach to young families throughout Greater Trail through daycares, family play groups, home & garden stores, libraries and other businesses and services that cater to young families. There also will be increased outreach to home renovation professionals and links to the RDKB building permits department.”
* Lead Paint Testing (should this be here????)
* Engagement of the home building sector - Contractor Training, what else?

### Soil Assessment (& Remediation?) in the Community

* Playgrounds, schools etc. Who remediates?

### Compliance Monitoring and Adaptation

* Describe how work will be evaluated/reviewed to determine the need for changes

### Summary and Conclusions

### References

SNC-Lavalin. 2011. Draft Trail Wide Residential Remediation Guidelines. Version 5. Prepared for Teck Metals Ltd. August 2011.

SNC-Lavalin. 2008. Draft. Soil Assessment Guidelines.

### Contacts

Please refer to Table 1-1 for more information or to obtain copies of the referenced documents.

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| **Table 1-1 Contact Information for the Home and Garden Program** | | | |
| Program Area | Contact Person | Contact Phone Number | Contact Email |
| Trail Health and Environment Program General Information | Mark Tinholt | 250-364-4385 | Mark.Tinholt@Teck.com |
| Residential Yard Remediation |  |  |  |
|  |  |  |  |
| Home Renovation Support Program |  |  |  |