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**RAB Sample Technician
Standard Operating Procedure
Training Document**

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1 Scope

This Standard Operating Procedure (SOP) covers all GroundTruth Exploration employees and any subcontractor's employees that are performing work for GroundTruth Exploration.

2 Objective

The objective of this SOP is to outline all steps that must be taken to ensure that samples are collected systematically and safely.

3 Large Equipment

- 1 Splitter
- 1 Cyclone
- 1 Dust suppression system (2 pieces of ducting, 1 fan motor)

4 Other Equipment

- 1 Blue Roll-a-Table

- 6 five Gallon Buckets with handles, no holes
- 3 Rubbermaid bins with lids (2 in constant use, one spare that can also be used as storage for sampling consumables)

5 Box Kit Equipment

- 1 Medium size action packer 90.8L for equipment
- 1 Binder with documents and lists
- 1 Rubber Mallet
- 3 metal wire sieves
- 1 Sample PVC spear/spike
- 1 Chip tray funnel
- 1 Spoon
- 1 Stapler
- Staples
- 2 Air gun
- 2 Bungee cords (1 for around bucket, 1 for around cyclone)
- 10m Rope
- 1 Skinny Snowbrush
- 1 STORE N LOCK 1.1L 4423-466 (Square) No smaller than that. The sizes are on the underside of the container. This contains:
 - 1 Compass
 - 1 Inclinator
 - 1 S5 charger
- 1 box of Sharpies
- 2-3 rolls Paper Towel
- 1-2 cans Bug Spray for cleaning tags
- 1 Mr. Buddy Heater with 20L Propane
- 1 Side cutters for removing zip ties
- Small Tarp to set up over sampling station when needed. If you keep it nice and tucked away in your box kit it won't turn into a nasty, wrecked mess. (YT specific)

4 Shift Gear

This is gear you bring to and from the drill EVERY SHIFT.

- S5 with spare battery
- Compass
- GPS (In Nunavut it stays at drill unless project manager or supervisor changes that)
- PPE: Hard Hat, ear protection, eye protection, safety boots, hi vis clothing, gloves

4 Consumables

- 4 Part plastic sample ID tags (25/book)
- 1 Write in the rain pad and pencil
- Ore Bags (12" x 20")
- Ore Bags (24"X36")
- Zip Ties
- Zipper Bags (2" x 4")
- Rice Bags
- Chip trays
- Sharpies
- Paper Towel
- Bug Spray for clearing tags
- Staples
- QAQC samples
- Security Zip Tags
- Flagging tape of all colors
- Water (know where your water sources could you use a natural water source or do you need to bring water jugs. Always have extra water because the Driller may use your water for stuck rods or other tasks. It is up to you to have that water available for yourself and the driller. If water is being hauled or heli supported, keep in contact with your driller and the person in camp placing orders when you will need water and how much ahead of time)

5 Job Hazard Analysis

Working in the wild is inherently dangerous. Working **alone** in the wilderness makes it more likely to sustain an injury, and makes the consequences of an injury much more severe. If one was to be injured and lose consciousness, it would be next to impossible to find them in the terrain and remoteness that GroundTruth typically works in. Similarly, if a serious injury is sustained, getting medical help to a worker as soon as possible, preferably within the first "Magic Hour," is essential to their prospects of survival.

This makes planning and communication an essential lifeline to all staff working in the field.

6 PPE

- CSA approved Hard Hats
- CSA approved Eye Protection

- CSA approved Ear Protection
- CSA approved Steel Toe footwear
- CSA approved High Vis
- Gloves when handling rods
- Dust Mask while drilling is occurring

7 Site Setup

Setting up the site properly is essential to safe and efficient workflows. The following sections outlines the principles of good site setup, while allowing for the flexibility to work around the various hazardous, topological and logistic factors. Circumstances can change for many reasons: mid shift, mid job or mid hole. Wind direction, terrain, weather, and traffic can all play factors. Remember to be smart and flexible.

The most important thing is to be efficient with your site setup. Minimal steps and minimal movements are key to speed and injury prevention.

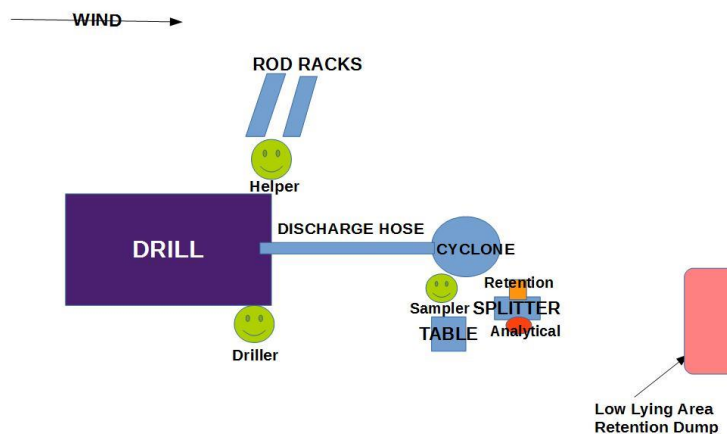
Assessing your terrain specifically where you wish to set up will save you time while sampling. The steepness of the hill, or stability of your site can be factors to how fast and safe your site is. Stepping over boulders, rocks, through the creek, over roots and deadfall, or scrambling up a steep hill will both be a tripping/slipping hazard and slow you down. You may need to look for a more suitable site, build a pad out of materials around you, clear roots and vegetation, or dig a part of the hill away to make the site more level. These are things you need to assess and mitigate. If it is not working, keep thinking of ways to make it better.

When possible try to set up slightly up wind from the cyclone and splitter so dust, and airborne particles are blown away from your site. This is important for health and safety of yourself as well as for sample contaminations and sight cleanliness. If the wind direction changes, be prepared to move. Of course if the wind is just circling and you'd have to move every sample, then moving may not be an efficient solution. You may then have to find ways to cover and protect your samples and stand out of the dust when you can, wearing your dust mask at all times. Another thing to consider is if the dust suppression is still working as it should.

A shelter is a great tool for keeping your supplies and samples clean. Sometimes it is hard to have the shelter close enough to the drill for efficient sampling, so you will choose to sample closer to the drill. However, it is wise to keep your spare supplies in the shelter in an organized fashion to keep them from blowing away or getting wet or snowed on. Remember to keep them organized so that if you need to ask a coworker to obtain supplies for you, the directions will be clear and easy to follow. Also be prepared that if the weather turns bad enough it may be ideal to sample in the shack and you may need to ask the driller and helper to help you move into the shelter.

Traffic may be infrequent depending on your job situation, however you may still get helicopters flying in for various reasons. Be prepared to secure your site if you hear or see traffic coming. Wind from aircraft can be very disruptive to your samples and your equipment.

Most importantly think about how you should work. In a perfect site, in perfect conditions, what would make the area safe and efficient. What can you do to make it a perfect site, with perfect conditions with what you have? I want the table, the supplies I need, the sample pile, the wash station, the splitter, and the cyclone in close proximity to limit the amount of steps I take. Samples can come from the drill fast and I don't want to have to spend my spare time moving from spot to spot. The most time should be spent ensuring the sample is quality.



Example of a Drill Sample Setup

8 The Team

One of the best parts of a team's workflow is to be flexible, and supportive of each other. The crew you immediately work with is not your whole team. Your whole team includes your cross shifts. The sampler you switch off with at the end of your shift has the potential to be your very best friend. Give them all the support you can, set them up for greatness. When you treat your cross shift with respect and support, everyone wins. My goal is to set my cross shift up to have a better shift than I did, this can be done in many ways, but sample prep is a great way. It can be very discouraging to arrive on shift to a big mess, no prepped bags, and your favourite tools

MIA. Remember to communicate with your cross shift what happened, what you have done, and where to find supplies, tools, and prepped items. And of course, do not punish your cross shift if they didn't meet your expectations, give them a pass or communicate what you would like for next time.

9 Sample Preparation

Sample preparation is key to the work flow. You will need to learn your team and find when the best time is to do your sample preparation occurs. Preparation is important so you will need to keep it as a priority, however be flexible to when you do it based on the needs of your team and the situations of the job.

Making sure your bags and tags are ready for the hole is going to help everything run more smoothly.

4 Part plastic sample ID tags. You can pre-write the fourth tag to have them ready ahead of time. Be careful that you don't get too far ahead pre-writing tags. If a hole is terminated early then your tag sequence will end sooner at end of hole. Bug spray and paper towel will wipe away sharpie off of both the tags and the ore bags if you make a mistake.

Tag 1- No writing and outside of analytical sample

Tag 2- No writing and Inside Analytical Sample

Tag 3- No writing and stapled to XRF sample.

Tag 4- retained in the book for records. The project with hole ID, and sample interval is written on the Sample ID tag. The last sample tag of the hole will also say EOH (End of Hole)

 17XXX-### INTERVAL(325-330FT) EOH <small>TAG 4 - RETAINED IN BOOK</small>  1485001	 <small>TAG 3 - NO WRITING</small>  1485001	 <small>TAG 2 - NO WRITING</small>  1485001	 <small>TAG 1 - NO WRITING</small>  1485001
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Ore Bags (12" x 20"). You should pre-write your sample tag number on your ore bags. Those can be written quite ahead of time to make sampling a smoother process. If I have extra time I will even make bags for a couple holes, so I am prepared for the possibility of a shorter prep time between holes.



Rice Bags can be difficult to prep because you cannot erase the writing on the bag. You can still write on some bags to speed the process. I typically will have the first five bags completely prepped as that brings the hole to about 100 feet, if you are uncertain that you will drill to that depth then don't prep that many bags. You can partially prep bags as well.

A completely prepped bag will have:

17XXX - ### (Hole ID, The XXX will be your project code followed by hole number.)

(This is known as your hole ID, it is the year, project code, hole #)

1485001 - 1485005 (Sample ID sequence)

5 Samples (Number of Samples)

Bag 1 of ____ (Rice Bag sequence, you will need to wait until depth to complete)

A partially prepped bag will have:

17XXX-__ _

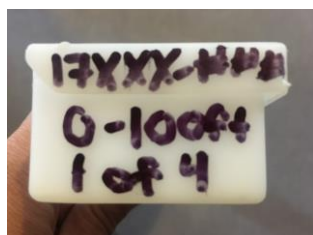
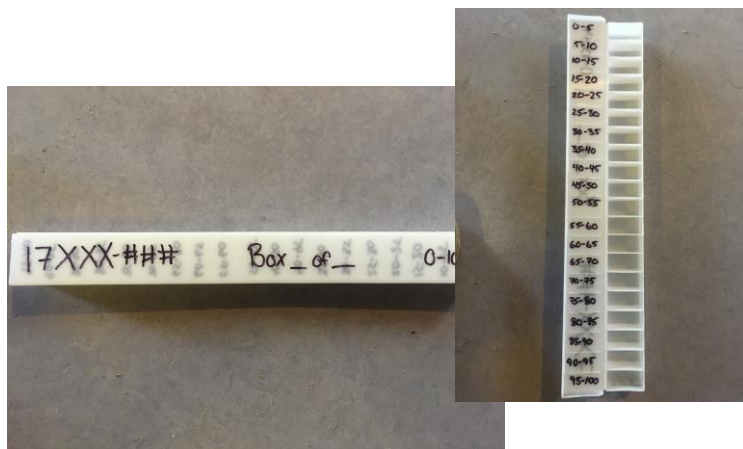
1485__ _ - 1485__ _

samples

Bag _ of _



Chip Trays can be partially prepped ahead of time and completed during use. Hole ID (17XXX-__ __), Box # of # (ie Box 1 of 4), and total depth interval of tray (ie 0 - 100 ft) is written on the outside lid and on one end of the tray. Individual sample depth interval is written on the inside of the tray lid adjacent the sample with the writing on the right side (chip sample on the left).



10 QAQC

QAQC protocols are determined on a project basis. Typically they consist of the insertion of alternating standards and blanks every 20th sample. Specific protocols for a project will be relayed to you by the project manager. Instead of writing hole depth on the fourth tag you will remove the sticker from the QAQC and stick it to the fourth tag. The QAQC will be placed inside the ore bag like an analytical sample would be and the same protocol will be followed for placing one tag inside the bag and one tag tied to the outside of the bag. You will not want anything left

on the sample to indicate which QAQC it is. The bagged QAQC sample will then be placed in the rice bag in order with the other sample IDs as a regular sample.

13 Duplicate Sample

If a duplicate sample is required the data logger will notify the sampler. In this instance another 12"x20" clear plastic sample bag should be attached to the small opening of the splitter and a second Rubbermaid bin placed under the large opening. The sample should be passed through the splitter a second time to obtain a field duplicate. Once complete sample tags should be attached, as per a regular sample and then logged into fulcrum as a duplicate sample.

11 Sample Procedure

It is important to follow the exact same procedure for all samples. Careful and meticulous sampling directly influences the confidence in the assay results. Remember that many decisions will be made based on these samples, and many people will be reviewing and analysing the results, photos, notes and methodology for many years to come.

1. Retention Sample (non analytical, 7/8 of sample) is received from splitter into a Rubbermaid container. (The specifics of this can change from job to job. Some projects may want you to retain the retention sample in large ore bags)
2. Analytical Sample (1/8 of sample) is received into 12x20 ore bag with the sample ID written across the front of the bag. One Sample ID Barcode tag is inserted into bag as backup ID tag. Bag is sealed with zip tie with external barcode Sample ID attached.
3. Buckets and Splitter are cleaned with pressurized air after each sample.
4. Representative Chip Tray sample is collected from Retention sample container by spearing 2" PVC pipe with cutaway into center of retention sample. Chip tray sample is strained to remove fines and washed in bucket of water prior to placement in chip tray. Hole ID, Box # of # (ie Box 1 of 4), and total depth interval of tray (ie 0 - 100 ft) is written on the outside lid and on one end of the tray. Individual sample depth interval is written on the inside of the tray lid adjacent the sample with the writing on the right side (chip sample on the left).
5. Representative XRF sample is collected from Retention sample by spearing. No fines are removed. XRF sample is bagged into 2" x 4" clear plastic ziploc bag with barcode Sample ID tag stapled to bag.

6. The fourth sample ID tag is retained in the book for records. The hole ID, and sample interval is written on the Sample ID tag to be used for later reference.
7. Sampling Technician logs sample ID and interval information on handheld device equipped with barcode scanner. Sample IDs are always scanned into device to initialize log entry. Entries are logged at every sample, not collected to log later.
8. Analytical sample is placed into rice bag with Project code, Bag Series and number of samples written in marker on bag. Each rice bag takes 5 samples. Make sure you double bag the rice bags. The inside bag does not need writing.
9. Retention sample is discarded. Try to be smart about where you discard your retention. Low lying areas and downhill are ideal. You cannot dump in running bodies of water such as lakes, rivers, and creeks. If you are dumping in puddles, you may want to consider saving a close puddle or two for water to clean equipment and fill your pail for washing chips. Trenches are a great place to discard the retention sample. Uphill will cause a dust storm when the helicopter comes.
10. Receive next sample.

This continues until hole depth is achieved.

Keep a notebook in your gear and take notes on everything you can. I.e when you hit water, when the driller gets the rods hung up, everything you write down could help you, the driller, or the geologist in the future.

12 Step by step breakdown

1. On a flat surface, place 5 gallon bucket underneath cyclone and secure the cyclone skirt to the bucket using a bungee cord to create a seal and prevent dust from escaping. (this is a part of dust control).
2. Secure analytical bag to the small opening at the front of the splitter. Place rubbermaid bin as tightly as possible at the back of the splitter.
3. Upon completion of a drill rod the driller will stop the drill feed and ensure all sample reaches the cyclone and blow the hole clear.
4. When bucket is full (but not overflowing) remove from under the cyclone. Replace with a clean bucket and secure as per step 1. The amount of material gathered from 1 rod will differ depending on the geology and ground conditions, it may be required to use more than one bucket per sample. And potentially more than one analytical sample. Drilling continues.
5. Pour the sample material through the top of the splitter, distributing evenly over the fins.

6. Turn on the vibrator to ensure all the sample material passes through the splitter. You may also need to hit the side of the splitter with a rubber mallet to help sample fall through the splitter. As a last resort, damp samples may require a snowbrush to push clumps through.
7. Once the sample has passed through the splitter remove the 12 x 20 analytical sample bag from the front of the splitter. Insert one Sample ID tag inside the analytical sample and secure the bag by sliding a zip tie through the second sample ID tag and closing around the neck of the bag, just above the sample. The zip tie must be tight so sample stays in the bag and no other dirt can go inside the bag. The analytical bag should already have the sample number written on it with sharpie. This is when you cross check that your sample tag has the same ID as what is written on the bag.
8. Remove rubbermaid bin containing the retention from the splitter. Use the PVC pipe spear to collect a representative sample by pushing the spear all the way to the bottom of the bin and place in dry sieve.
9. Fill 2" x 4" XRF bag (about ¾ full, if too much material is in the bag it will not seal properly). Staple the sample tag (corresponding to the analytical sample) to the XRF bag and place in a bag that will have the drill hole ID and sample sequence on it.
10. Sieve the remaining representative sample to remove fines and separate chips.
11. Wash the chips in a bucket of water, making sure to remove all fines.
12. Spoon chips into the chip tray using a funnel.
13. Log sample into Fulcrum. This is a must. Every Sample must be recorded before the next sample is started.
14. Place analytical sample in rice bag. Rice bag should already have the hole ID, sample sequence, and bag sequence written on it in sharpie. Make sure you double bag the rice bags. The inside bag does not need writing.
15. Dump the retention. (This may differ for different projects)
16. Clean all equipment (splitter, buckets, rubbermaid) with compressed air.
17. Place rubbermaid bin back underneath the splitter Repeat for next sample.

****Every few samples with the assistance of the drill sampler, clean the cyclone, dust suppression ducting, and dust suppression fan with compressed air and lifting and shaking the ducting.**

****Change your chip sample wash water when your chips are no longer coming clean more often is acceptable if you have an accessible natural water source.**

Commented [1]: Insert reference to MX Deposit workflow

13 Water

It is common to hit water when drilling in the Yukon. At this time it is important to remove the dust suppression to keep the ducting and fan clean of water and mud. Remember to use the compressed air to clean the ducting before putting it away. It is also important to make your driller aware if you have hit water and if you suspect you are to hit water. With experience you will start to learn the markers of potential water. The sample changes texture, temperature, and general appearance before you hit the flow of water.

When your sample gets too wet it does not split accurately. Typically we give time for the sample to settle, to do this you may need to back load a few samples. Keep your samples in order so you know which is which. You may need to write on flagging tape and attach it to the sample to avoid mix up. Once the sample has a little time to settle, typically about 3 samples, you can pour the clean water off the top. Using your pvc spear you can spear out 1/8th of the sample to place in your analytical sample bag. This replaces running the sample through the splitter and the rest of the sample can continue as usual. Do leave a comment in your sample in Fulcrum that there is water. If you do run a wet sample through the splitter, care must be taken to thoroughly clean splitter and all equipment involved to prevent cross-contamination.

It is also important to report water or the suspicion of water to your driller in the event you are drilling in a location where water can cause major problems, such as Nunavut. Hitting water can cause more challenges in some areas over other areas. A call from the driller to project manager may be very important in these instances.

14 Shipment Bag

(Yukon specific)

Reference survey-specific Shipment Bag SOP

A collection of 5 samples within a double bagged rice bag.

1. Scan each sample into each rice bag (double rice bagged).
2. After the samples have been logged into the rice bag then you will seal the rice bag with a security zip tie.
3. Scan the security zip tie to correspond to the Shipment Bag

15 Shipment Set

(Yukon specific)

Reference survey-specific Shipment Set SOP

A collection of shipment bags (rice bags) make a shipment set

1. Scan the security zip tie from the shipment bag into the shipment set
2. When all shipment bags have been scanned into the shipment set the shipment is then complete.

16 Shipments sent to HQ

For Yukon, HQ is likely GroundTruth Yard in Dawson. For Nunavut, HQ is likely the camp you are basing from.

Yukon

1. Reference the Chain of Custody SOP

Nunavut

1. Bring your samples (or as many as you can) back to HQ(camp) at the end of every shift, as close to in order as you are able.