APPENDIX - E

STD PROCTOR

METHODOLOGY

Field Density Testing and Compaction Control

Field Sampling Procedures

The field density test results will be compared to values determined by a relative density or a moisture-density relationship, it is very important that the soil is the same in both instances. Therefore, make sure that the sample taken is representative of the soil that is to be used.

Remove any surface organic topsoil before sampling. Generally, fill material is obtained from a location that extends from just below the topsoil to significant depths. It is, therefore, important that a representative sample or representative samples be obtained for the entire soil profile. A representative bulk sample for a homogeneous soil should be made up of smaller samples taken at several depths. If there are significant changes in soil types over the profile, several relative density and/or moisture-density relationship determinations may be required and sampling will have to be done accordingly.

In sampling material from stockpiles, it is sometimes difficult to ensure representative samples due to the segregation which usually occurs during stockpiling. The coarser particles tend to roll out and end up at the base of the pile. Every effort should be made to enlist the services of power equipment that is capable of exposing the material at various levels and locations. Take samples at or near the top of the pile, at or near the base of the pile, and at or near an intermediate point. A board shoved into the pile just above the point of sampling will aid in preventing further segregation during sampling. Combine and thoroughly mix the small samples taken from the several locations in the pile so that a representative bulk sample of the required volume is formed.

Preferably, fine aggregate samples should be obtained by means of a sampling tube approximately 25mm in diameter and 1.8m in length. With a little practice, the tube will hold damp sand, which is forced into it as the tube is inserted in the pile to be sampled. Five to eight insertions will furnish approximately 5kg of fine aggregate.

Trim an area of the sidewall of the test pit, trench or open cut, to remove all weathered or mixed material. Examine the exposed face for changes in gradation and representative strata selected for sampling.

Obtain either individual or composite samples by cutting a groove of uniform cross-section down the vertical face of the excavation. Collect the sample on a polyethylene sheet or a suitable cloth spread out at the base of the cut. The minimum cross-section dimension of the largest gravel size included in the soil.

In taking individual samples, it is important to be certain that sufficient representative material is obtained from the stratum and to see that extraneous material is not included. For composite samples, cut a vertical groove through the strata, which are to be included.

Standards

All samples should be collected and tested using the following standards:

ASTM D 4700 - Standard Guide for Soil Sampling from the Vadose Zone.
ASTM D 75 - Standard Practice for Sampling Aggregates.
ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort [12,400 ft-lbf/ft^3 (600 kN-m/m^3)].

Density of Soil in Place by Portable Gauge Nuclear Densometer

General Statement

The two major considerations of all safety measures are:

1. Protection of the user.

2. Protection of the general public.

Protection of the user is through appropriate training in the use of the instrument and periodic checks on the instrument to monitor radiation levels that may vary with use or abuse. Docimetry monitoring badges are a record of the user's accumulated exposure dosage and are included as a mandatory part of the license.

It is the intention of the safety regulations to protect all parties, not to frighten them nor bind them with laborious rituals.

Safety & General Information

Important: No employee shall operate a nuclear densometer (surface moisture-density gauge) unless authorized by the (Technical) Supervisor.

The (Technical) Supervisor shall ensure that staff are fully aware of the instructions and procedures regarding safety, operation, and day-to-day maintenance of nuclear densometers (nuclear surface moisture-density gauge) and have read and understand such instructions.

Staff undergoing training in the field operation of nuclear densometers shall be accompanied by an experienced operator until the (Technical) Supervisor is satisfied that the employee-in-training is competent and knowledgeable in the use of the device. The responsibility for such safety and training shall rest with the Supervisor.

Safety Precautions

The quantities of radioactive material contained in Nuclear Moisture-Density devices are quite small, and an operator may safely use a device day after day without receiving any bodily damage due to radiation, provided certain precautions are taken. The isotope sources and total activities are:

Radium - Beryllium	4.5 millicuries
Americium 241 - Beryllium	50.0 millicuries
Cesium 137	10.0 millicuries

Shielding against radiation can be provided by two means: distance, and the interposition of matter. Distance is one of the best protections. The intensity of radiation falls off as the inverse square of the distance between the center of the source and the target. For example, with radiation transmitted through air at a distance of 305mm from a bare source of Americium 241 - Beryllium, the exposure would be approximately 9.24 millirem per week. A one-shot whole body dosage of less

than 200 rem is not considered harmful, but a dosage greater than 600 rem results in 100% fatality. In addition, each radioactive source is doubly encapsulated and sealed to afford even greater protection for the operator. However, all radioactive sources, no matter how small, should be handled with care.

Although nuclear densometer devices can be operated quite safely, the following general precautions shall be observed.

1. Do not operate or attempt to operate a Nuclear Moisture Density device unless you have been authorized to do so by the (Technical) Supervisor.

2. DO NOT smoke or eat during operation of the device. Radioactive materials are extremely harmful if ingested and retained in the body.

3. Wear a film badge or other radiation measurement device at all times while working near, operating, or transporting the device.

4. Ensure the radiation symbol of the device is clearly visible at all times.

5. When using a piece of nuclear equipment on a job site, do not leave it unattended unless it is properly secured or protected. Lock the equipment in the fail-safe position when not being operated.

6. Do not transport nuclear equipment in vehicles that are not specifically authorized for its transportation.

7. When transporting equipment in authorized vehicles, lock it in the fail-safe position and secure it to the vehicle in the boxes provided for that purpose.

8. Do not place the nuclear equipment in the passenger area of a vehicle. Equipment may be stored in a locked vehicle only when people are not in the vehicle at the same time.

9. Store nuclear equipment in the locked lead lined box provided in the storage room area of the company's office building.

10. Be familiar with, and follow established procedures, when using the device.

11. Never lift or move the device from a test site when the probe is extended in the testing position.

12. Be familiar with instructions for emergency action in incidents involving radioactive materials and the handling of film badges.

13. When in doubt, ASK.

Radiation Safety Training

The testing company must be licensed by the Canadian Nuclear Safety Commission (CNSC) to store, transport and operate portable nuclear moisture-density gauges. A condition of the licence

requires all personnel to be trained to transport and operate the gauges.

The testing company should provide training and certificate upon completion for the following:

2. Radiation Safety
3. Gauge Operation
4. Transportation of Dangerous Goods - Class 7 Radioactive
5. Radioisotope Licenses and Other Regulating Requirements
6. Emergency Procedures

The above training certificate must be carried at all times when operating the gauges.

Docimetry Badges

The Canadian Nuclear Safety Commission requires that docimetry badges be worn at belt level when working with the Nuclear Moisture-Density devices. This badge is for the operator=s protection and should be handled and stored very carefully. Listed below are general rules to be followed when using the Badges.

1. Wear the docimetry badge when working with the device.

2. Place the badge in safe storage when not being used. Do not store the badge near the Nuclear Moisture-Density device, or in the open, or near any type of radiation.

3. Do not remove the film from the holder at any time.

4. Do not place near excessive heat, keep dry and away from moisture, keep light from inside the packet.

5. Do not clip the film badge on the sun visor of the vehicle and close the vehicle up on a warm day.

6. Do not place the film badge on the dashboard near the windshield so the sun will shine on the badge or so the defroster will blow on the badge.

7. Never stand near a stove with the film badge because the heat will affect the film.

8. Remove your film badge in the case of medical X-rays.

9. Do not stand near a television, especially color TV, with your badge.

10. Do not remove your badge when transporting the nuclear device to or from the laboratory. Leave badge in the laboratory during non-working hours.

11. Place the film badge in the records safe when not in use.

12. Be careful with the holders as they break easily. These holders are plastic and are for the protection of the film.

Although there are several units of radiation measurement, there are only two with which the

operator of a nuclear densometer gauge needs to be familiar. These are the curie and the rem.

The curie is defined as the quantity of any radioactive material giving 3.7×10^{10} disintegrations per second (dps). That is, in a curie of radium, 3.7×10^{10} atoms would decay each second.

The strength of sources used in nuclear densometer gauges is usually expressed in millicuries (one millicurie is one-thousandth of a curie, or 3.7×10^{7} dps). Therefore, a 3 millicurie radium source yield $3 \times (3.7 \times 10^{7}) = 11.1 \times 10^{7}$ dps , or 111 million dps.

In order to calculate the amount of radiation absorbed by a human being, a unit called the rem is used. Because the amount of absorbed radiation is usually small, doses are usually expressed in millirem (thousandths of a rem). The millirem is actually a measure of the effectiveness of the body in absorbing radiation, and depends on the type and energy of the radiation.

In order to protect personnel from overexposure to radiation, the Canadian Nuclear Safety Commission (CNSC) and the Federal Radiation Council have established exposure limits for radiation workers. These limits, expressed in millirems, are reproduced in the following table.

These limits are intended to be conservative, and do not represent the absolute maximum exposure a person could receive without becoming ill or suffering radiation damage. However, it is advisable to remain under the limits whenever possible. This can be done quite easily with nuclear densometer gauges, by following established precautions.

Table 1: Exposure Limits for Radiation Workers

Type of Exposure	Millirem Limits for 13 Weeks	Millirem Limits for 1 Week
Sensitive Regions (whole body, eyes, gonads, skull)	1,250	96
Kidney, spleen, lungs, liver	5,000	385
Skin of whole body	7,500	577
Hands, arm, feet, ankles	18,750	1,422

To calculate the accumulated radiation or dosage, multiply the amount of radiation present (mrem/hr) by the length of time within the field equals the dosage (rem).

The CNSC regulations permit an occupational dose to an adult worker of 5.0 rem - per year, or 1.25 per quarter, or approximately 100 mrem per week. This is whole body exposure, not merely exposure to hands or feet.

Normal operation circumstances do not require the operator to be within 0.6m of the gauge more than approximately 15 seconds per test. Site preparation is normally done with the gauge set aside or in the vehicle, and the gauge is brought out only when the site is ready. An operator can make

approximately 1 to 20 tests per day on an average, with a gauge.

Assume he makes 20 tests per day in a busy five-day week. How much radiation will be absorbed?

Example 1:

(15 seconds - 1/4 minute)

1/4 minute x 20 tests x 5 days = 25 minutes
Close work with the gauge per week
Round it off to 30 minutes or 2 hour

2 hour @ 0.5 mrem/hr = 0.25 mrem dosage

The weekly allowance is approximately 100 mrem.

The operator received 1/400th of his allowed weekly occupational dose in this busy week.

NEVER EXPOSE THE SOURCE UNNECESSARILY AND

NEVER, NEVER, UNDER ANY CIRCUMSTANCES, TOUCH THE SOURCE.

THE SAFEST AMOUNT OF RADIATION IS *NO* RADIATION!

Site Preparation and General Procedures

- All nuclear meters are sensitive to the test surface presented to them. It is the responsibility of the operator to present a representative seating area to the meter.

- Remove the top 50mm (approx.) of material so that soil with a representative moisture content is visible. After the passage of a sheepsfoot, or a similar type of compaction equipment, be sure to remove material to at least 30mm below the deepest penetration of the foot. The scraper plate supplied with the densometer can be used to scrape and lightly tamp an area large enough to seat the densometer.

- Remove all loose or projecting pebbles. Fill in surface voids with native fines, Texas frack or Ottawa sand to obtain intimate contact with the complete bottom of the meter. Use the least amount of fill necessary. A properly prepared surface will still allow original surface to show through.

- Ensure that other nuclear equipment is not located within 5 m during a test. Have no large equipment near. Keep at least 300mm away from abutments, curbs, sidewalls in a trench, etc. If it feels as if a stone is being pushed by the rod when driving the rod, move over at least 300 mm and make a new hole. Do not place the densometer so that the counter is over a large pebble, cobble or boulder. This will result in a lower than representative moisture count and a higher than representative density. When making tests in a trench, it is a good idea to locate the densometer parallel to the trench axis for density tests.

- Moisture tests made with the source over a large pebble, cobble or boulder will give a lower

then representative count. The nuclear densometer measures moisture content of materials due to thermalization of fast neutrons by the hydrogen content of the water. Therefore, water bound in crystalline form such as in gypsum or the hydrocarbons in organic materials, such as coal, will distort the moisture counts. If significant amounts of coal, gypsum or other organic material are present at the test site, it is advisable to use a conventional moisture content test procedure. If the moisture test is being done in a confined area, such as in excavations near solid objects such as concrete blocks, pillar walls, large boulders, and piles of soil. Be sure to carry out a calibration count for moisture at the test location. This will reduce errors due to reflection neutrons. You must also obtain a sample of the material (clay only) in order to determine water (moisture) content by the standard method, that is ASTM D 2216-80.

- Use the direct transmission method for density measurements, Using the rod guide (scraper plate), drill rod and a two or three kilogram hammer, punch a hole into the material at least 50mm deeper than the direct transmission depth to be used. Place one foot on the rod guide while driving the rod into the material. Remove the rod by pulling straight up in order to avoid disturbing the hole. In heavy clay, it may be necessary to lightly tap the rod to loosen it or use a optical rod jack for removal. When making density tests, do not place the counter over a large pebble, cobble or boulder. The high density of the stone will distort the count. Make sure the densometer is located so that the source is tight against the hole on the counter side to avoid excessive voids and a resultant distorted count. Pulling the unit with the counter towards you, and with a slight shaking motion, will seat the source in the best position in the hole.

Standard

All testing using a nuclear demsometer should be completed following ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) and subsequent references.

APPENDIX – F

ENVIRONMENTAL EFFECTS MATRIX.

ENVIRONMENTAL EFFECTS MATRIX

What is this for?

			PROJECT PHASES		
			DESIGN	CONSTUCTION	OPERATION AND MAINTENANCE
ECOLOGICAL EFFECTS	Terrestrial	Vegetation			
		Wildlife (including waterfowl)			
		Habitats/Communities			
		Rare or Endangered Species			
	Aquatic	Fish			
		Vegetation			
		Aquatic Furbearers			
		Habitats/Communities			
		Rare or Endangered Species			
HUMAN HEALTH		Toxicological			
		Psychological and Emotional Well-being			
		Long Term Effects			
		Inhalation/Ingestion			
PHYSICAL/CHEMICAL EFFECTS	Groundwater	Flow and Water Table Alteration			
		Interaction with Surface Drainage			
		Water Quality Changes			
	Surface Water	Drainage/Flood Characteristics			
		Flow Variation			
		Water Quality Changes			
		Shoreline and Bottom Alteration			
	Land	Erosion			
		Soil Suitability			
		Unique Physical Features			
		Stability (Slides and Slumps)			
		Flood Plain Usage			
		Buffer Zones			
		Stress-Strain (Earthquakes)			
		Alteration of Permafrost Regime			
		Compatibility of Land Uses			
		Compaction and Settling			
	Noise	Intensity			
		Duration			
		Repetition			
	Atmosphere	Air Quality			
		Atmosphere			
		Ice Fog/Inversions			
		Air Characteristics/Visual			

AESTHETIC EFFECTS	Relief and Topographic Character	
	Odours	
	Sounds	
	Visual	
	Biota—Animals/Diversity of Vegetation	
	Composite Effect/Unique Composition/Mood/Atmosphere	
	Water Appearance and Taste	
	Anthropogenic Objects/Consonance with Nature	
SOCIO-ECONOMIC EFFECTS	Employment and Labour	
	Demography	
	Regional Transportation	
	Housing and Community Infrastructure	
	Economic Benefits to Community	
	Health, Education and Social Services	
	Local Governments	
	Lifestyle and Quality and Life	
PHYSICAL AND CULTURAL HERITAGE	Protection of Sites	
	Cultural Interests and Values of Aboriginal Peoples	

LEGEND

N/S	Not Significant
B	Beneficial
S	Slight Impact (localized, short duration)
M	Potentially Significant (mitigable)
N/M	Potentially Significant (not mitigable)
U	Unknown Effect

APPENDIX - G

SAMPLING PROTOCOLS

WERI

SOIL SAMPLING PROTOCOL

1.0 INTRODUCTION

The purpose of this protocol is to provide standard methods and procedures for soil sampling.

2.0 SITE ASSESSMENT PROCEDURES

2.1 Site Characteristics

Note any surface structures for evidence of subsurface pathways. Describe the history of the location, present status and future disposition. Obtain or prepare maps of the general area. Obtain information from published material, site visits and contacts.

2.2 Contaminant Characteristics

Describe contaminant(s) under investigation including sources, types, quantities, concentrations, properties and risk factors. Identify locations of fuel storage tanks, pipes and dispensers, onsite plans, and diagrams. Note their proximity to the proposed boreholes.

3.0 SAMPLE COLLECTION METHODS

All soil sampling will be carried out in accordance with the methods and procedures outlined in this protocol. Clean latex gloves will be worn during each sampling event.

3.1 Documentation

All pertinent information is to be recorded in a field note book. This information should include:

- soil discoloration if present;
- impounded water on surface;
- proximity to vehicle pathways and public access;
- anecdotal observations (weather, ground conditions, wildlife, people, machinery, etc.); and
- a rough site sketch showing former sampling locations and identifiable markers that will help establish the location of the excavations.

3.2 Sample Locations

The boreholes are to be located in the highest potential areas where contamination may occur.

3.3 Sampling Equipment

The samples will be taken from split spoon samplers where available. If the split spoon samplers cannot be used, samples will be obtained directly off of the auger flights. The top 5 mm of soil will be scraped off the auger flight before a soil sample is obtained. Areas where the drill rig cannot be used, samples will be obtained using a hand auger or shovel. The equipment required for soil sampling includes:

- 500 ml clear glass wide mouth jars with continuous threaded lids;
- 250 ml clear glass wide mouth jars with Teflon ™ lined lids;
- Latex gloves;
- coolers for transporting samples to laboratory;
- field note book;
- site sketches or drawings;
- MicroTip PhotoVac IS-3000C for headspace analysis;

- electric cooler used to keep samples cool in field; and
- tin foil used to cover samples for headspace readings.

3.4 Sampling Procedure for Soil

The procedure for collecting the soil sample is as follows:

- wear clean latex gloves for each sampling event;
- obtain soil from the borehole;
- fill a large Zip Loc bag with 250 ml jar worth of sample for headspace analysis

Headspace Procedure (once a soil sample has been extracted):

- once sample is in bag shut quickly to seal bag;
- shake the bag for 15 seconds;
- allow headspace development for a minimum of 10 minutes;
- if the outside temperature is <10°C, place sample in warm environment (eg. running vehicle) to bring temperature up to 10 to 20°C. Ensure the sample is **not** placed directly over the heater vents. This will heat the sample and may cause high readings on the PID;
- vigorously shake the bag for another 15 seconds;
- open bag only enough to insert meter probe;
- insert meter probe into hole and take reading for 15 seconds and record maximum.

3.5 Sampling Interval

Soil samples will be collected every 0.75 m starting from the surface. In cases where this interval cannot be taken, the soil sample will be taken from the bottom of the borehole. Soil samples collected from the boreholes are used to determine the level of hydrocarbon contamination. This determination is done using the PID.

3.6 Sample Containers

The following guidelines will be administered:
Use only 250 ml glass jars with Teflon ™ lined lids for soil samples shipped to the laboratory; ensure that a minimum amount of air is left in the sample jar.

3.7 Labeling

Sample jar labels will contain the following information: (1) the date the sample was taken, (2) the sire code, (3) the location of the sample (e.g. side, bottom), (4) samplers initials. The letter(s) identify the sire and the number is to identify the sample location. Record all information in the sample log. Samples provided to the laboratory are to be identified by sample number to limit bias.

3.8 Sample Preservation

To ensure preservation of the samples they will be stored in soil sample jars in an electric cooler or non-electric cooler with ice packs. The optimum storage temperature is 4°C. The samples will be protected from direct exposure to light.

3.9 Sample Transit Form/Chain of Custody

Record all required information on a sample transit form (attachment number 1). The information is to include sample numbers and parameters to be measured. Use a separate sample transit form for each location, indicating the site location under project (top right hand corner). The chain of custody, located at the bottom of the transit form, is to be completed from sample collection in the field to receipt of samples by the

laboratory. Sign and date the form each time the sample is transported or shipped during transit from the field to the laboratory. Send the form along with the sample container and retain a copy of the form each time it is signed off for the project file.

4.0 SAMPLE STORAGE AND TRANSPORT

4.1 Storage

Protect the samples from prolonged exposure to light. Samples are to be stored at 4°C in a dark refrigerator or walk-in cooler. Record the date and time when the samples are placed in interim or longer term storage.

4.2 Transport

The jars must be packaged in such a way that they will sustain a drop from one meter onto a concrete floor without breakage. Individually wrap each sample container with bubble wrap, place cardboard between sample containers and pack samples in coolers. Place ice packs on the top of the samples. Ensure that each bottle is protected from breakage and label damage. Address the coolers with the address of the laboratory, contents of cooler (e.g. glass jars containing environmental water samples) and mark the cooler with 'FRAGILE' and 'THIS WAY UP' labels. Deliver or ship samples to the laboratory immediately after collection by the fastest and safest means possible. Samples can be shipped by Air Canada Cargo or Canadian Cargo, Greyhound, etc.

Notify the laboratory that the samples have been shipped and provide the waybill number. Fill out chain of custody form and send.

5.0 SAMPLE ANALYSIS

5.1 Laboratory Analysis

Samples will be submitted to the Canadian Association for Environmental Analytical Laboratories (CAEAL) accredited laboratory for analysis. Some of the more common analyses are listed in Table 1.

Table 1: Common parameters measured and laboratory procedures followed for environmental testing.

PARAMETER	MEDIUM	UNITS	TEST METHOD
Oil and Grease	Soil	mg/kg	EPA 3550 and Std. Methods 5520E, P (18th ed. 1992)
BTEX	Soil	mg/kg	EPA 5030, 8020
Total Volatiles	Soil	mg/kg	EPA 5030, 8015
Total Semi-volatiles	Soil	mg/kg	EPA 9073
Lead	Soil	mg/kg	EPA 3020
Heavy Metals	Soil	mg/kg	EPA 6010
PAHs	Soil	mg/kg	EPA 8310
PCBs	Soil	mg/kg	EPA 8080
Phytotoxicology	Soil	ppm, mS/cm, %	See Attachment 2

5.2 Calibration of PhotoVac meter (may vary from model to model)

Calibration of Micro Tip PhotoVac IS-3000C:

- take meter out of carrying case and turn on to let warm up;

- take gas sampling bag out of instrument carrying case (clear bag with valve);
- attach calibration gas bottle to bag via hose assembly in carrying case;
- open valve on bag and turn gas valve on to fill bag (3-5 seconds);
- remove cylinder from bag and remove gas in bag. This flushes out any ambient air trapped in the lines and sample bag;
- hook the gas cylinder back up and fill bag until the top is round and soft. DO NOT OVERFILL;
- close valves on bag and cylinder and disconnect calibration gas;
- calibrate meter to zero ppm by running meter in clean air for 15 seconds. This will zero readings;
- hook up meter to bag and open valve;
- in a few moments, the LED reading should correspond with the calibration gas valve;
- if readings are outside allowable parameters, refer to manual for adjustment;
- if readings are within allowable parameters, continue with soil capour analysis.

6.0 QUALITY ASSURANCE (QA)/QUALITY CONTROL(QC)

6.1 Duplicate Samples

Duplicate samples are required to check accuracy of laboratory results. There will be one duplicate per site. Collect two samples from the same location in the excavation, but label the second one with a different number. Record all labeling information in the field notes. There can be no indication to the laboratory of the actual location it came from or which sample is being duplicated.

7.0 ANALYTICAL LABORATORY

Samples will be analyzed by Enviro-Test Laboratories, a CAEAL accredited laboratory.

8.0 ATTACHMENTS

1. Sample transit/Chain of custody form.
2. Test Methods.

ATTACHMENT 1

Sample Transit/Chain of Custody Form		
Laboratory: Enviro-Test Laboratories 745 Logan Avenue Winnipeg, Manitoba R3E 3L5 Ph.: (204) 345-3705 Fx.: (204) 945-0763	Location:	Project:
	Project No:	Date:
	Sender:	

Sample ID	Description	Number & Type of Container	Analysis Required
Sent By:	Received By:	Comments:	

ATTACHMENT 2

Test methods for carious parameters.

Parameter	Procedure
Ba, Be, Cd, Cr, Co, Pb, Mo, Ni, Ag, V, Zn	Mod. USEPA 3050B/6010B
Sb, As, Se	Mod. USEPA 7061A, 7741A/Std Mth 3114B
Hg	Mod. USEPA 7471A
Cr^{6+}	Mod. USEPA 7196A
Specific Conductance	Mod. USEPA 9050A/Std Mth 2510
pH	USEPA 9045C
Oil and Grease	Mod. USEPA 3550/Std Mth 5520E,F
Sodium Absorption Ratio	Ammonium acetate extr. (calc. as per OMAF/MOEE guidelines)
Total Kjeldahi Nitrogen	Mod. Std Mth 4500-N_{org} B