

Guide to the Code of Practice for Energy Recovery

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ALBERTA ENVIRONMENT

**GUIDE TO THE
CODE OF PRACTICE FOR ENERGY RECOVERY**

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Copies

Information and copies of the *Code of Practice for Energy Recovery* and this *Guide* may be obtained from:

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<http://www3.gov.ab.ca/env/contact/index.html>

Important Note

This document provides additional information and clarifies the intent of the *Code of Practice for Energy Recovery*. For a comprehensive perspective the following documents should be consulted:

- *Environmental Protection and Enhancement Act (EPEA or the Act)*
- *Activities Designation Regulation (ADR)*
- *Waste Control Regulation (WCR)*
- *Substance Release Regulation*
- *Code of Practice for Energy Recovery (the Code)*
- *Code of Practice for Small Incinerators*
- *The Alberta User Guide for Waste Managers (the User Guide)*

Acronyms

AENV	Alberta Environment
AUOMA	Alberta Used Oil Management Association
AFC	Alberta Fire Code
CSA	Canadian Standards Association
EPEA Guide	Environmental Protection and Enhancement Act Guide to the Code of Practice for Energy Recovery
ERCB	Alberta Energy Resources Conservation Board
O&GCA	Oil and Gas Conservation Act
MOU	Memorandum of Understanding

1. INTRODUCTION

The first Alberta Environment (AENV) guideline on fuel derived from waste was introduced by AENV in 1993. The guideline was replaced by a *draft Code of Practice for the Production of Alternate Fuel and the Burning of Fuel Derived from Waste* in 1998. Finally, in September 2005, the *Code of Practice for Energy Recovery* (the *Code*) replaced the draft document. Since 1998, more than 200 operators have registered with AENV to produce alternate fuel or burn waste as fuel. Registrations issued prior to the publication of the *Code of Practice for Energy Recovery* are valid and registration holders need not to re-apply pursuant to new *Code*.

The *Code* specifies the requirements to be met by persons who prepare small quantities of liquid fuels or recover energy from recyclables or waste. These two related but distinct activities are:

- the production of *alternate fuel* from 10 tonnes or less of recyclable material per month; and
- the burning of any quantity of waste as fuel.

Part A of the *Code* applies to both activities, Part B is relevant to the production of *alternate fuel*, and Part C relates to *wastes or recyclables burned as fuel*.

The *Code of Practice for Energy Recovery* reflects AENV shift from conventional to advanced waste management with a focus on resource conservation and the beneficial use of waste including waste-to-energy options whenever appropriate. Wastes or recyclables with a high heat value include a broad range of substances from used car lubricating oil or spent cooking oils to shredded polystyrene scrap or miscellaneous non-recyclable plastic material.

This Guide provides information to support the *Code* and explains when and how the *Code* applies. Within this context, section 2 identifies Alberta legislation applicable to fuels production and waste-to-energy activities. Section 3 identifies the type of authorization (approval or registration) required under the *Environmental Protection and Enhancement Act*.

2. BACK-UP LEGISLATION

Any person responsible for a waste-to-energy activity, including the activities identified above and to which the *Code of Practice for Energy Recovery* applies, should be familiar with the legislation identified next. All Alberta's legislation is available to view free of charge on the Queen's Printer's Bookstore website at <http://www.qp.gov.ab.ca>.

- ***Environmental Protection and Enhancement Act (EPEA)***
 - *Section 38* establishes the legal back-up for the codes identified in the Regulations.
- ***Activities Designation Regulation (ADR)*** (AR 276/2003 including AR 113/2006)

- Sections 2(1), 2(2) and 3(1), specifically the definitions for *alternate fuel*, *burning waste as fuel*, and *energy recovery*.
- Section 5 (2) on the designation of activities and approvals required;
- Section 6 on combined authorizations that empower the Director to issue combined or individual approvals or registrations where more than one activity takes place at one particular plant site, as appropriate;
- Clause (a) in Schedule 1, Division 1, Waste Management, identifies the treatment of more than 10 tonnes of waste by thermal processes as an activity that requires approval under the *EPEA*.
- Clause (c) in Schedule 1, Division 1, Waste Management, identifies the collection and processing of more than 10 tonnes of waste or recyclables per month to produce fuel as an activity that requires approval under the *EPEA*.
- Clauses (b) and (d) in Schedule 2, Division 1, Waste Management, identify the operation of small incinerators and conducting energy recovery, respectively, as activities that require registration under *EPEA*.
- ***Waste Control Regulation (WCR)*** (AR 192/96 including AR 87/2007):
 - Section 11 or section 18 on requirements for the storage of hazardous wastes or hazardous recyclables.
 - Section 14 empowers all the Codes of Practice under the *EPEA* and the *WCR*; links to Schedule 4 which identifies waste/recyclable activities and the respective Codes of Practice; addresses the status of current registration holders; and defines the scope of these codes vis-à-vis *EPEA* approvals.
 - Schedule 4 in Column A imposes compliance with the *Code* identified in Column B.
- ***Substance Release Regulation*** (AR 124/93 including AR 159/2005)
 - Sections 4 and 8 on opacity and particulate matter apply when not covered by an approval or a code of practice.
- ***Release Reporting Regulation*** (AR 117/93 consolidated up to 386/2003)
 - Section 3 on quantities and accidental releases of specific substances into surface water, watercourses or groundwater.
- ***Code of Practice for Energy Recovery*** (the *Code*).
- ***Alberta Fire Code***, 1997 (*AFC*)

3. **DEFINITIONS**

All definitions in the *EPEA* and its *Regulations* apply to the *Code of Practice for Energy Recovery*. Specifically, the *Code* includes definitions relevant to the activities regulated in the document. The following comments are intended for interpretation and clarification of some of the *Code* related definitions.

3.1 “alternate fuel” [3(1)(a), *ADR*; 1.2(b) *Code*] is a liquid derived from suitable organic recyclable materials that is used as a fuel in combustion units or space heaters for the purpose of producing heat or electricity.

The *ADR* defines *alternate fuel* as a liquid that

- (i) is capable of being pumped,
- (ii) is derived from recyclables,
- (iii) has a net heat value equal to or greater than 12 780 kilojoules per kilogram (5500 BTU per pound),
- (iv) meets all of the quality limits for the parameters as specified in Table 10-1 of the *Code of Practice for Energy Recovery, 2005*, published by the Department, as amended from time to time, and
- (v) may contain, without limitation, one or more of the following substances:
 - (A) oils, including but not limited to, automotive lubricating oil, compressor oil, fuel oil, gear oil or hydraulic oil;
 - (B) fuels, including but not limited to, diesel, naphtha, gasoline or kerosene;
 - (C) condensate that contains less than 0.2 parts per million of hydrogen sulphide;
 - (D) antifreeze;
 - (E) glycols;
 - (F) alcohols;
 - (G) non-halogenated solvents that contain less than 0.2 parts per million of hydrogen sulphide; and
 - (H) animal or vegetable based oils;

Most *alternate fuel* produced in Alberta is derived from used mineral-based engine lubricating oil. Used lube oil from motor engines and undrained oil filters removed from internal combustion engines is designated as hazardous waste (Waste Type 201) by the *Alberta User Guide for Waste Managers*. Used lube oil from internal combustion engines generally has hazardous characteristics and shall be handled as stipulated by the *WCR* and *ADR* during collection, transport, and storage or when processed to meet the quality identified in Table 10-1 of the *Code of Practice*.

Though most *alternate fuel* is produced from used crankcase oil, the Alberta definition of *alternate fuel* is comprehensive enough to include oily tank bottoms and waste animal fats and waste vegetable oils that are being recycled. For a liquid to qualify as *alternate fuel* it must have a minimum heat value or heat of combustion of 12780 kJ/kg (5500 BTU/lb) and meet the criteria of Table 10-1 of the *Code*.

Oils, fuels, and other products identified in the definition of *alternate fuel* include substances that are either contaminated or unfit for its primary purpose. However, the *Code* definition of *alternate fuel* does **NOT** apply to

- solid or gaseous fuels prepared from waste or biomass,
- liquid fuels prepared from more than 10 tonnes of recyclables per month,
- biofuels such as bioalcohols (i.e., ethanol, methanol, etc.) prepared from crops or biomass, or biodiesels prepared from oily seeds or animal fats.

To assess the suitability of substances used as a source of *alternate fuel*, the primary reference is the list of substances identified in the definition of *alternate fuel* and the limits identified in Table 10-1 of the *Code*. These limits, exception made for PCBs, were set to reflect the typical quality of engine car lubricating oil after use. Mixing and diluting hazardous halogenated or metal-containing wastes with genuine recyclables even when the final mixture does not exceed Table 10-1 limits, contravenes section 16 of the *WCR*.

Preferably, suitable recyclables for the production of any fuel, including *alternate fuel*, should be compared against the hazardous waste limits identified in the *WCR* (Table 2, *User Guide*) and Table 10-1 of the *Code*, and taking in due account Section 16 of the *WCR* which takes precedence over the *Code* criteria. Suitable PCB-containing waste or oil used in the preparation of *alternate fuel* and the fuel itself shall not exceed the maximum allowable limit of 2 milligrams of PCB per kilogram of waste or oil and, of course, the maximum acceptable PCB content in the final *alternate fuel* shall not exceed 2.0 mg/L as indicated in Table 10-1 of the *Code*.

3.2 “appliance” means a device used to convert fuel, including *alternate fuel*, into energy and consists of all components, controls, wiring, and piping required to be part of the device by the applicable standard.

For purposes of this guideline standalone individual storage tanks or containers are not considered part of the appliance unless these tanks or containers are incorporated in the appliance.

3.3 “burning waste as fuel” [3(1)(a.1), *ADR*] means the thermal destruction of waste or recyclable for energy recovery in a thermal converter, combustion unit or space heater, but does not include

- the burning of alternate fuel,
- the burning of 4500 litres or less of used oil per year provided that the used oil had been generated on-site and is burned in equipment that meets *CSA* standards, or
- activities under the *ERCB*'s mandate.

A person who wants to burn any quantity of waste or recyclable as fuel to produce heat or electricity and that waste or recyclable does not meet the definition of alternate fuel (before or after processing) needs to register with AENV under Part C of this *Code*. Subject to the exemptions identified above, a registration is required regardless of the amount of waste or recyclable involved. The waste or recyclable being burned has to meet the quality identified in Table

10-2 of the *Code*. In addition, emissions from the burning have to respect current requirements of the *Substance Release Regulation* for particulates and opacity. When burning more than 10 tonnes of waste as fuel per month, the burning unit must include features that ensure compliance with the emission limits indicated in Table 14-2 of the *Code*.

The burning of waste as fuel under controlled conditions is distinct from open burning. The burning of prohibited debris by means of an open fire does not fall under the scope of this *Code*. This activity, if allowed, has to be regulated under an *EPEA* approval [clause (k) in Schedule 1, Division 1, of *ADR*].

This definition affects the current wording of subsections 8(6), 8(7), and 8(8) of the *Code of Practice for Asphalt Paving Plants (COPAPP)*. This *Code* is being amended but until that amendment takes place and for consistency between the two codes, those subsections should be understood to mean the following:

All liquid fuel, other than virgin fuel grade product, used in the production of asphalt at asphalt paving plants shall come from a facility authorized under the Environmental Protection and Enhancement Act.

Regarding subsection 8(8) of the *COPAPP*, it is noted that the burning of waste as fuel is now addressed under Part C the *Code of Practice for Energy Recovery*. On the other hand, the burial of waste, including the burial at asphalt plant sites, is prohibited in Alberta unless it is done in compliance with section 23 of the *WCR*. Consequently subsection 8(8) of *COPAPP* is now obsolete.

3.4 “combustion unit” [2(1)(b), *ADR*] means an industrial kiln, an oven, a furnace, a boiler or a process heater.

This definition includes combustion units at facilities that may use the fuels discussed here as a source of heat or electricity. Industrial kilns include rotary kilns used in cement or aggregate production plants and industrial furnaces, such as roasters used for decontaminating empty containers or electrical equipment.

3.5 “container” means any portable device which is or was used to store flammable or combustible fuel (i.e., with a flash point less than 93.3^o Celsius) and from which the fuel-burning equipment is not intended to be fed automatically. Compare with definition 2(1)(c.1) in the *ADR*]

3.6 “energy recovery” [1.2(e) *Code* and 3(1)(c.1), *ADR*] means

- (i) the production of alternate fuel, or
- (ii) burning waste as fuel for the purposes of producing heat or electricity but does not include
 - (A) the burning of 4500 litres or less of used oil per year provided that the used oil
 - (1) is generated on-site, and
 - (2) it is burned in equipment that meets *CSA* standards; or
 - (B) an activity that has been authorized under the *Oil and Gas Conservation Act*.

Any time a person uses substances (otherwise unwanted and commonly known as wastes or recyclables) as a source of heat or electricity, the person is conducting energy recovery. Candidate waste/recyclables must have a high heat value, being suitable to combust in approved units, and be free of persistent organics or metals. These substances might be:

- *Alternate fuels* – these are pumpable liquids that meet before or after processing the definition of *alternate fuel*. Examples include cleaned used engine oil, off spec vegetable oil, etc., or
- *Wastes or recyclables burned as fuels* – these ones are used directly as fuel or processed to produce gaseous, liquid or solid fuels. Examples include landfill gas, refuse-derived fuel, off-spec plastics, shredded plastic containers, tire rubber crumb, meat meal, etc.

These substances are not and should not be managed as wastes, even if they were generated as such by the producer. They constitute a resource. What is legally considered a hazardous waste or a hazardous recyclable is defined in Schedule 1 of the *Waste Control Regulation (WCR)*.

3.7 “material safety data sheet” or “MSDS” [1.2(h) *Code*] means a document that contains, at a minimum, the information required by the *Hazardous Products Act (Canada)* and the information set out in section 11.1(a) of the *Code of Practice*

The producer of *alternate fuel* shall gather and provide technical information on the characteristics of the *alternate fuel* produced and supplied to third parties. This information should be described in the MSDS for the *alternate fuel* and include without limitation the following:

- identification of the alternate fuel;
- physical and chemical data (e.g., type and quality of the alternate fuel as specified in Table 10-1 of the *Code*);
- hazardous or dangerous classification;
- handling and storage procedures; and
- first aid and emergency response to accidental releases, etc.

This definition will be superseded by definition of “MSDS” proposed to the revised upcoming versions of the *WCR* and the *User Guide*.

3.8 “production of alternate fuel” [3(1)(f.1), *ADR*] means the collection and processing of 10 tonnes or less per month of recyclables to produce *alternate fuel*. The recyclables collected are in most cases used oil from cars or trucks but they may include many other suitable liquid organic substances that processed as needed, result in a product that meets the quality criteria identified in Table 10-1 of the *Code*.

A person who collects and processes these recyclables in quantities that do not exceed 10 tonnes per month and produces *alternate fuel* meeting the quality

specified in Table 10-1 of the *Code* needs a registration under *EPEA*. When the quantity of recyclables collected to produce any fuel, including *alternate fuel*, exceeds 10 tonnes per month, in any month, the person doing so needs an *EPEA* approval [*ADR*, Schedule 1, Division 1, clause (c)]. Because this might be confusing, **it is emphasized that only the production of *alternate fuel*, and not its burning in space heaters or combustion units, requires registration or approval under *EPEA*.**

3.9 “prohibited debris” [1(1)(j), *SRR* or 2(1)(n), *ADR*] means any combustible waste that, when burned, may result in the release to the atmosphere of dense smoke, offensive odours or toxic substances and includes but is not limited to

- (i) animal manure,
- (ii) pathological waste,
- (iii) non-wooden material,
- (iv) waste material from building or construction sites, excluding wooden materials that do not contain wood preservatives,
- (v) combustible material in automobile bodies,
- (vi) tires,
- (vii) rubber or plastic, or anything containing or coated with rubber or plastic or similar substances, except rubber or plastic attached to shredded scrap steel,
- (viii) used oil,
- (ix) wood or wood products containing substances for the purpose of preserving wood.

3.10 “recyclable” [1(eee) *EPEA* and 1(gg) *WCR*] means a substance or mixture of substances that is intended to be recycled. In *EPEA* “*recycle*” means to do anything that results in providing a beneficial use for a thing that otherwise would be disposed of or dealt with as waste, including collecting, transporting, handling, storing, sorting, separating and processing the thing, but does not include the application of waste to land or the use of a thermal destruction process.”

EPEA states that the thermal destruction of a waste is not recycling. However, any time that we sort out suitable substances, including wastes, and process them into fuel or other a beneficial product that meets well-defined specifications we are no longer dealing with a waste but rather with a product. These substances are not intended to be disposed of and thus do not meet the definition of waste any more. Examples abound: used tires, cleaned pesticide plastic containers, specific off-spec organics, styrene scrap, creosote treated wood, plastic containers, filters or cartridges, etc. For handling and process reasons, these substances are generally shredded or otherwise reduced in size before use as fuel.

3.11 refuse-derived fuel” means a solid fuel prepared from the combustible and /or organic fraction of mixed municipal waste characterized by a high heat value.

The segregation of this combustible fraction uses a range of processing techniques including screening, air classification, magnetic separation, and shredding to achieve a product with higher heat value than raw municipal waste.

3.12 “secondary containment” means a containment system including double walls that

- (i) is external to the primary storage tank/container, pipes and tubing;
- (ii) is designed to prevent the contents of the primary tank/container, pipes, and tubing from leaking outside the containment system; and
- (iii) has a capacity of at least 110% of the capacity of the larger primary tank plus 10% of the accumulative capacity of all the other tanks when more than one tank is within the same containment system.

3.13 “storage tank” means a stationary device used for the storage of fuel and from which the fuel-burning equipment is not intended to be fed automatically.

Stand alone tanks and containers used for the storage of flammable and combustible fuels (flash point less than 90.3^o Celsius) should be provided with secondary containment to contain spills, including the water used for fire fighting purposes, as required by the *AFC*. The *WCR* has similar requirements for tanks and containers holding hazardous recyclables or hazardous wastes.

3.14 “thermal converter” [1.2(r), *Code*] means a device for energy recovery that uses indirect heat to separate organic components from a waste or recyclable to produce fuel.

Thermal converters use indirect heat to separate volatile organics from a matrix of wastes or recyclables and/or convert these organic constituents into waste derived fuel. This conversion may use a variety of processes that include without limitation gasification, pyrolysis, plasma systems, depolymerization, distillation, and evaporation. Prime candidate wastes are organic municipal solid waste (MSW), agricultural wastes, animal wastes including manures and carcasses, specified risk material (SRM), wood, agricultural residues, etc. The fuels obtained from these processes are often very clean, have a high heat value, and may be used directly on-site or elsewhere in the production of heat or electricity.

3.15 “used oil” [3(1)(l), *ADR*] means a petroleum-based oil that has been used primarily as lubricating oil in, without limitation, combustion engines, turbines, transmissions, gear boxes and hydraulic equipment

The *Code* states [1.2(c) and 2.3(d)] that on-site burning of used oil produced by the person responsible for the facility in quantities that do not exceed 4500 litres per year does not require registration. However to qualify for a rebate from the *Alberta Used Oil Management Association*, the person burning used oil on-site has to either hold a registration under the Code of Practice or provide evidence that the used oil with or without further processing meets the quality limits for the parameters identified in Table 10-1 of the *Code*, as applicable. In the latter case,

the used oil is an alternate fuel as defined in the *Code* and no additional registration is required for its use as fuel.

The chemical make-up of lube oils includes hydrocarbons distilled from crude petroleum and additives that improve the oil performance. Used oil contains in addition decomposition products formed when the oil is exposed to high temperatures and pressures inside an engine, metals from the wear and tear of engine parts, and small amounts of gasoline, antifreeze, and chemicals that come from gasoline when it burns inside the engine. There is no limit in Table 10-1 for the water content, which should be controlled to prevent inflating the volume of used oil eligible for rebate. The Alberta Used Oil Management Association incentive applies only to spent lube oil used in the production of *alternate fuel* or burned as such when its quality meets Table 10-1 criteria.

In Alberta, used oil removed from internal combustion engines (cars, trucks, compressors, etc.) is considered a hazardous waste – Waste Type 201 - or a hazardous recyclable. Other spent lubricating oils from gear boxes, hydraulic equipment, or cutting oils may have to be tested and classified based on their own merits.

4. WHO DOES THE CODE APPLY TO?

This *Code* applies to any person who constructs, operates, or reclaims a facility for energy recovery by:

- (a) *producing alternate fuel from recyclables where 10 tonnes or less of those recyclables are collected per month for that purpose; or***
- (b) *burning any quantity of waste as fuel to produce heat or electricity.***

To carry out any of these energy recovery activities, a person requires a registration under *EPEA*. Waste management or recycling activities that require registration under *the Act* are listed in Schedule 2, Division 1, clauses (a) to (f) of the *ADR*.

Part A of the *Code* identifies general requirements applicable to anyone engaged in either (a) or (b) described above. The only exemption applies when a person burns 4,500 litres or less of his/her own used oil, generated and used on-site, and the person does not want to register under the *Code*.

4.1 Facilities Governed by EPEA Approvals

The *ADR* in Schedule 1 identifies activities that include the production of fuel or alternate fuel as an ancillary component of the main activity at one particular site.

4.1.1 Activities Involving Fuel Production

Schedule 1, Division 1, Waste Management, clause (c) of *ADR* requires approval to produce fuel - any kind of fuel - including *alternate fuel* when the quantity of recyclables or wastes collected for that purpose exceeds 10 metric tonnes per month and is processed by using physical, chemical, biological, or thermal

processes that may include without limitation any one of the following technologies:

- plasma gasification or pyrolysis of tire crumb or organic MSW to produce liquid and gaseous fuels;
- shredding, grinding or fluffing municipal solid to produce a solid fuels;
- depolymerization of animal tissue including SRM to produce liquid fuel;
- chemical and/or biological processing of biomass residues (i.e., from wood harvesting and processing, agricultural crops, or other organic residues) to produce a fuel;
- using meat, bone or blood meal as supplementary fuel in cement kilns; or
- using shredded empty plastic containers including pesticide containers as fuel in industrial kilns.

4.1.2 Activities Other than Fuel Production

It is important to note that the *Code of Practice for Energy Recovery*, including the quality criteria for *alternate fuel* identified in Table 10-1, does not necessarily apply to activities/facilities governed by an *EPEA* approval [section 5(1) and Division 1 or Division 2, Schedules 1 or the *ADR*].

The Director has discretion to use the *Code*, parts of the *Code*, or new provisions through an approval amendment that apply to the additional unit/process dedicated to the *production of alternate fuel* or to the *burning of waste as fuel* at existing facilities (s 6 of the *ADR*). The approval conditions have to address all the environmental impacts of the overall operation that is often complex and made up of a multitude of activities with specific and accumulative environmental impacts.

4.2 Production of Alternate Fuel

Registration under Part B of this *Code* is required when a person collects 10 tonnes of suitable recyclables or less per month to produce alternate fuel. Most cases involve the collection of used oil from cars and trucks, storing and processing the used oil by settling and/or filtration to remove suspended solids and excess water, collecting a representative sample, and burning the used oil as fuel during the cold months in space heaters. A commercial laboratory, at an estimated cost of about five hundred dollars will test a representative sample for all the parameters in Table 10-1 of the *Code*.

The *Code* does not apply when the amount of recyclables collected and processed to produce alternate fuel exceeds 10 tonnes per month. In this case the activity is governed by an approval under *EPEA* [*WCR*, section 4(5)]. Once registered or approved by AENV, the registration holder should contact the AUOMA at <http://www.usedoilrecycling.com> or (780) 414 1510 to register with that association and access the rebate for the volume of used oil recycled into alternate fuel.

Space heaters or combustion units where *alternate fuel* is burned do not require authorization under *EPEA* to burn this fuel. The fuel comes from facilities that

have been either approved [ADR, Schedule 1, Division 1, clause (c)] or registered [ADR, Schedule 2, Division 1, clause (d)(i)] under *the Act* and, as such, no additional approvals apply.

4.3 Burning Waste as Fuel

Non-liquid organic wastes, recyclables, or off-spec products with high heat value but not meeting the definition of *alternate fuel* might still be burned as fuel (i.e., waste-to-energy) in combustion units. These situations are becoming more common as waste-to-energy solutions and registration under Part C of the *Code* is required under *EPEA* [ADR, Schedule 2, Division 1, clause (d)(ii)].

This burning of suitable organic solid waste as fuel should not be confused with:

- (a) the burning of *alternate fuel*, covered by part B of the *Code*, or
- (b) the production of other fuels derived wastes and recyclables when more than 10 tonnes per month of waste or recyclables are used to produce the fuel, covered by clause (c), Schedule 1, Division 1 of the *ADR*.

Examples of the last activity include the production of solid, liquid or gaseous fuels such as refuse-derived fuel from municipal solid waste; biogas from the anaerobic digestion of animal wastes; or the production of other fuels obtained by liquefaction, gasification, pyrolysis, plasma, etc., of suitable organic waste or biomass residues.

4.4 Used Oil Produced and Burned On-site as Fuel

Persons collecting their own used oil and burning it on-site as a source of heat include do-it-yourselfers, owners of oil change facilities, vehicle service shops, transport companies, garages, etc., who produce small quantities of used oil. Small quantity is any volume equal to or below 4500 litres. Over this limit, registration was dealt with in 4.1. Two options are available and either one still entitles the person to claim a rebate from the Alberta Used Oil Management Association for the used oil burned as fuel.

(a) Produce Alternate Fuel and Register under Part B of the *Code*

This option is included in 4.2 above and involves processing the used oil as needed. A representative sample shall be taken and tested for the parameters in Table 10-1. Compliance with the limits in Table 10.1, after removal of excess water and suspended solids, is needed to entitle the person to a rebate from the AUOMA for the volume of used oil recycled. Again, as in 4.2, any combustion unit or space heater used to burn this *alternate fuel* on-site or off-site does not require any further approvals or registrations under *EPEA*.

(b) Burn the Used Oil On-site Without Testing

Up to 4,500 litres of used engine lubricating oil may be burned on-site as fuel without a registration. No testing is needed. In most of these situations the person does not file a claim for a rebate from AUOMA because the potential rebate money does not offset the testing required by AUOMA. However, even in these cases, the user still has to comply with particulates and opacity limits for the gaseous emissions as required by the *Substance Release Regulation*. In

addition, the space heaters or the combustion units burning this used oil still have to meet CSA standards.

4.5 Illustrative Cases

EXAMPLE 1: LubeOil Does it All, Ltd. is a car service company. The company collects about 6,000 litres of used engine oil per month and would like to use it as fuel. Some of the common questions asked and respective responses are identified next:

- **Can the company use this spent lube oil to heat the service shop during the cold months?** Yes, they can utilize the used oil as fuel in their space heater. The unit should meet CSA standards.
- **Do they have to process the used oil to meet the quality of Table 10-1?** The used engine oil shall be collected, stored, filtered or decanted as needed to remove excess suspended solids and water. Testing and compliance with the limits in Table 10-1 dictate the need for any potential additional processing.
- **What kind of sampling and testing needs to be done?** A representative sample of the processed used oil should be obtained prior to use of the *alternate fuel* for the first time and every three years thereafter. The samples shall be split, one subsample kept for three months, and the other analyzed by a credited laboratory for the parameters in Table 10-1, except for PCBs and net heat value.
- **Why is the testing for PCBs not required?** Because spent lube oils from cars' internal combustion engines should not contain PCBs unless the used oil was purposely mixed with PCB fluids. PCBs are dielectric fluids used in electrical equipment such as capacitors or transformers. Testing for PCBs should be done for enforcement purposes or when the used oil is from unknown or suspected sources, only. On this basis, PCB testing is required when the used oil is from *uncontrolled* bottle depots, collection tanks at landfill sites, or any other unidentifiable sources.
- **Why is the testing for the net heat value not required?** Because spent lube oil from cars internal combustion engines has a very high net heat value, about four times the minimum required for alternate fuel. So, there is no need to spend money to find out the obvious.
- **What information do they have to provide to register with AENV?** Schedule 1 of the *Code* identifies the information required. Parts A and B of the *Code* apply to persons producing "alternate fuel", only. Parts A and C apply to persons burning waste as fuel, only.

EXAMPLE 2: TireFuel Ltd. wants to produce a fuel derived from tires by liquefying the rubber. They intend to process 500 tonnes of tires per month. The company is looking at a pyrolytic process where tires are shredded and thermally reduced to a liquid fuel and a solid residue (fabric and steel). The liquid fraction is a mixture of hydrocarbons, sulphur, and other additives used in tire manufacture.

- **What kind of authorization is required under EPEA?** As the company intends to produce a fuel from processing more than 10 tonnes of

waste/recyclables per month an approval is required [ADR, Schedule 1, Division 1, clause (c)].

- **Is the intended operation affected by this Code?** No, when an approval is issued the approval holder is not required to comply with the *Code of Practice for Energy Recovery* identified in Schedule 4 of the *Waste Control Regulation*.
- **How to proceed?** For application details, processing, and financial security requirements, the AENV office responsible for that particular location should be contacted at <http://environment.alberta.ca/contact.html>.

EXAMPLE 3: SynChem Inc. operates a chemical process plant in Alberta. Last month a process upset resulted in 1200 tonnes of unusable polystyrene scrap.

- **What are the management options available?** Recycling makes a lot of sense for all types of polystyrene packaging but this waste (a jelly rubber-like yellowish-brown polystyrene scrap) is not re-useable. Landfill disposal is an option but not environmentally sound. In the absence of persistent chemicals, a *waste-to-energy* alternative makes a lot of sense.
- **Can the company use this “waste” as fuel?** Yes, provided that waste meets the criteria identified in Table 14-1 of the *Code*.
- **What regulatory requirements apply?** SynChem shall complete the application form in Schedule 2 of the *Code*, for a registration or amend their current *EPEA* approval to include the additional activity (s 6, *ADR*). Pre-conditioning the scrap might be necessary to feed the material to one of their boilers.

5. WHO DOES THE CODE “NOT” APPLY TO?

In some situations persons preparing or burning fuels that are derived from wastes or recyclables are exempt from registration. The *Code* does not apply and registration is not required when:

- the person burns *fuel*, including *alternate fuel*, produced by a facility approved or registered under *EPEA* ;
- the person burns 4,500 litres or less of used oil per year generated on-site and the burning equipment meets *CSA* standards;
- the activity has been authorized by the ERCB under the *O&GCA*;
- the activity is covered by an approval issued by AENV under *EPEA*;
- the waste is from single-family detached dwelling; or
- the waste is from kitchen camps at mining, construction or demolition, drilling and exploration sites.

Due diligence and compliance with environmental legislation are still a must that the operator should adhere to. This includes the storage of wastes/recyclables, emissions, releases, etc.

5.1 Burning of Alternate Fuel

The production of *alternate fuel* is regulated under *EPEA* by registration or approval depending on the quantities of wastes or recyclables from which the fuel is prepared. When more than 10 tonnes per month of waste or recyclables are used to produce fuel including alternate fuel, an *EPEA* approval is required. When the quantity of the raw material required is equal or less than 10 tonnes per month then a registration applies.

The *Code* controls emissions from the burning of *alternate fuel* by imposing requirements on the quality of the fuel. This is a pollution prevention approach that reduces *EPEA* approvals and monitoring compared with what would be needed should AENV have chosen to regulate the burning units, instead. The design and installation of used oil-burning equipment is covered at national level by the Canadian Standards Association (*CSA*) codes. The space heater or combustion unit should be certified by ULC, C-UL or *CSA* as meeting CAN/*CSA* codes. Regulatory overlap is avoided and the approach is consistent with the regulation of conventional fuels.

5.2 Burning 4500 L or less of Used Oil/Year

The used oil has to be generated on-site and must be burned on-site in *CSA* approved units. This quantity was determined by taking into account the *CSA* space heaters minimum fuel requirements and the analytical costs required registering as a producer of alternate fuel. The limit of 4500 litres per year represents the minimum amount of used oil generally required for the operation of a conventional small *CSA* listed space heater.

5.3 Activity Associated ERCB Approval under the O&GCA

Oil and gas exploration sites and related production plants are regulated by the ERCB. All on-site activities including the type of operation discussed here should be covered by the ERCB approval for that particular site. Related proposals are to be forwarded to the appropriate ERCB regional office and no registration under *EPEA* is required.

This approach is in line with the joint AENV/ERCB waste policy of having “one regulator, one approval, one site” for the activities they regulate. This policy has been formalized in the *Memorandum of Understanding on the Harmonization of Waste Management* (ID 2000-03). The *MOU* is available on-line at www.ERCB.gov.ab.ca.

5.4 Main Activity Covered by an EPEA Approval

AENV issues comprehensive authorizations that should cover all on-site environmentally related activities regardless of their number or nature. These activities may require one or more approvals, registrations, or notices and may be covered in one or more documents, as appropriate, and at Director’s discretion. The nature of the authorization is dictated by the activity that triggers the most stringent requirements, in most cases an approval. The Director may address in this approval all the activities that take place at that particular site or,

alternatively, he may decide to issue separate authorizations (approval, registration or notice) for each and every activity. This flexibility brings efficiency to regulation by reducing the number of approvals required. Section 6 of the *ADR* and section 14 of the *WCR* address this matter.

5.5 Single-Family Dwelling Burning Its Own Waste Oil as Fuel

The waste is generated on-site and results from single-family detached dwelling, only. This waste can be managed on-site provided that the management practices comply with general environmental legislation and local municipal by-laws, as applicable.

This exemption is not to allow on-site open burning of prohibited debris. Open burning of prohibited debris requires an *EPEA* approval [clause (k) of Schedule 1 of the *ADR*] and is not covered by this exemption.

5.6 Wastes/Recyclables from Temporary Camps

Waste from camps at mining, construction, demolition, drilling or exploration sites is generally produced in limited amounts on a temporary basis and often at remote locations. Heat recovery devices used to manage suitable wastes and recyclables from temporary camps are exempted from registration.

5.7 What about Bio-Fuels?

The *Code of Practice for Energy Recovery* does not apply to production of bio-fuels (i.e., bio-alcohols and bio-diesels) resulting from processing agricultural crops, vegetable oils or animal fats. Bio-alcohols, including bio-ethanol, are generally produced from sugar-rich or starchy crops such as sugar cane, beets or cereals or from cellulosic material. Bio-diesels are oxygenated fuels or fuel additives derived from vegetable oils or animal fats by reacting these oils/fats with ethanol under acidic conditions.

EPEA approvals apply to activities related to the commercial production of bio-fuels. The construction, operation or reclamation industrial plants for the production of bio-diesel or bio-ethanol are dealt in the *ADR*, sections 2(2)(h) and 2(2)(l) under the designation of “chemical manufacturing plant” or “distillery”, respectively. Approvals for these plants are required by section 5(1) and Schedule 1, Division 2, Substance Release, Part 2(b)(i)] or Part 4(d)(vi), respectively.

6. PRODUCTION OF FUELS FROM WASTE OR RECYCLABLES

The **production of fuels**, including *alternate fuel*, from suitable wastes or recyclables means the collection and processing of organic wastes/recyclables to produce fuel that can be used on-site or sold to third parties provided that the production and quality of the fuel meet the conditions of an approval or of a registration under Parts A and B of the *Code of Practice for Energy Recovery*.

6.1 Approval Required

When the quantity of recyclables or wastes collected to produce any *fuel*, including *alternate fuel*, exceeds 10 tonnes per month, in any month, the person

responsible needs to obtain an approval pursuant to *EPEA*. This requirement is identified in the *ADR*, section 5(1) and Schedule 1, Division 1, clause (c).

6.2 Registration Required

When the recyclables collected do not exceed 10 tonnes per month, the production of *alternate fuel* requires an *EPEA* registration, only. This activity is identified in the *ADR* [3(1)(f.1), 5(2), and Schedule 2, Division 1, clause (d)] and subject to Parts A and B of the *Code*. In most cases, the production of *alternate fuel* involves used lube oil but it may include other suitable organic liquids that, processed if needed, result in a product that meets the definition of *alternate fuel*.

It is critical to keep in mind that only the production of fuel (and not its burning in space heaters or combustion units) that requires an EPEA approval or registration.

7. PRODUCTION OF ALTERNATE FUEL

Recyclables suitable for the production of alternate fuel have to be tested and processed, as required, when the feedstock does not meet the quality identified in Table 10-1 of the *Code*. The chemical data from testing the alternate fuel together with information on the proper use of the fuel and a statement advising users that the burning units have to meet *CSA* standards shall be included in a Material safety Data Sheet (MSDS).

7.1 Quality of Alternate Fuel

The quality of alternate fuel, in terms of allowable concentrations of heavy metals, halogenated compounds, and solvents has been defined based on the expected quality of engine lubricating oil upon use. This assumes that no hazardous compounds are present in concentrations higher than those expected in spent crankcase oil as it might be the case after mixing the oil with hazardous wastes for purposes of avoiding regulatory requirements. The comments in Section 8 regarding the chemical parameters identified in Table 10-1, interpret their meaning, and recommend on how to proceed when facing specific issues associated with analytical requirements.

7.2 Material Safety Data Sheet

A MSDS is a document that contains information on the characteristics and handling of a substance or product, including what to do in case of accident. The producer of *alternate fuel* with hazardous characteristics (i.e., from used oil, solvents, etc.) is required by the *Code* to develop a MSDS.

Alternate fuel produced by *EPEA* approved or registered facility and supplied to third parties or transported off-site shall be accompanied by an MSDS. Used oil that does not originate from Alberta is classified as Waste Type 201, a hazardous waste/recyclable. Consequently, it requires a **recycle docket** or a **manifest/movement document** during provincial or transboundary transport, respectively. Movement in Alberta of less than 205 L of used oil does not require a recycle docket. Information on the AENV manifest and recycle docket is available at www3.gov.ab.ca/env/waste/rr/Manifest.html.

8. BURNING OF WASTE AS FUEL

The burning of waste as fuel is the thermal destruction of waste or recyclable for energy recovery. This activity, as defined in the *Code*, does not include the production and burning of fuel (including *alternate fuel*), or the burning of 4500 litres or less of used oil per year, provided that the used oil is generated on-site and is burned in equipment that meets *CSA* standards.

8.1 Registration Required

Burning a waste or recyclable as fuel to produce heat or electricity requires a registration with Alberta Environment under the *Code* [5(2) of the *ADR*].

The waste or recyclable being burned has to be tested for the applicable parameters and meet the quality identified in Table 14-1 of the *Code*. In addition, emissions from the burning process have to meet the particulate and opacity requirements of the *Substance Release Regulation*. When burning more than 10 tonnes of waste as fuel per month, the burning unit must comply with the emission limits in Table 14-2 of the *Code*.

9. PRODUCTION OF POWER*

When the burning of wastes or recyclables to produce steam or thermal electrical power that exceeds a rated production output of one megawatt under peak load, an *EPEA* approval is required, upon consideration of existing approvals and section 6 of the *ADR*.

Emissions requirements in Table 14-2 of the *Code* for particulate matter, NO_x and SO₂, are consistent with *EPEA* power plant emission requirements.

10. SUMMARY OF EPEA AUTHORIZATIONS

In summary, *EPEA* authorizations required for waste-to-energy projects, including the production of fuel including alternate fuel, power or the burning of waste as fuel are as follows:

Table 1 - EPEA Authorizations for Waste-to-Energy Projects

Activity		Approval	Registration	Form to Use
Production of fuel including alternate fuel	From ≤ 10 tonnes of recyclables/month	-	X	Schedule 1
	From > 10 tonnes of recyclables/month	X	-	Contact Regional Office
Production of power from waste/recyclable	Rated production output > 1 MW or > 10 MW at a sawmill	X	-	Contact Regional Office
Burning waste as fuel	≤ 4,500 litres of used oil per year	-	-	Exempt
	Burning waste as fuel (any quantity)*	-	X	Schedule 2

* Check 2(2)(vv) and Schedule 1, Division 2, Part 9, (i) of the *ADR*. When a plant burns waste or a recyclable to produce steam or thermal electrical power and has a rated production output greater than one megawatt under peak load, then an *EPEA* approval may be required.

Persons currently holding a registration issued prior to September 30, 2005 under *EPEA*, to produce alternate fuel or to burn used oil in space heaters or combustion units, do not require additional registration under the *Code of Practice for Energy Recovery* for continued operation.

11. HOW TO REGISTER

Except as identified in section 5 of this Guide, a person

- *producing alternate fuel from ≤ 10 tonnes of recyclables/month, or*
- *burning waste as fuel*

is required to apply for a registration from AENV. To obtain information on how to register contact the respective AENV regional office. Contacts and information on AENV regional offices dealing with the application for registration are available on line at is available at <http://www3.gov.ab.ca/env/contact/index.html>.

11.1 Application Forms

The forms in Schedule 1 or Schedule 2 are to be used when submitting an application for a registration. **Schedule 1 applies to the *production of alternate fuel from ≤ 10 tonnes of recyclables/month* and Schedule 2 applies to the *burning of waste as fuel*.** The application must include **ALL** the information identified in either schedule, as applicable. Delays in registration completion caused by waiting for missing information, such as analysis, postpone registrant access to AUOMA incentives.

Completed applications for registration should be sent to the Regulatory Approvals Centre at the address below. The application is recorded, forwarded to the appropriate AENV regional office, and reviewed prior to issuance of a registration number.

**Regulatory Approvals Centre
5th Floor, Oxbridge Place
9820 106 Street
Edmonton , Alberta
T5K 2J6**

**Phone (780) 427 6311
Fax (780) 422 0154**

For regulatory consistency and illustration purposes an example of a registration template issued under the *Code* is attached as Appendix 2.

11.2 Who collects the technical data?

Space heaters or combustion units that burn alternate fuel (cleaned spent used oil) are generally manufactured in large numbers and sold to many end users by a few companies. In many cases, the information required for registration such as the design features, operating conditions, and emissions from these units are comprehensively collected, assessed, and gathered by the manufacturer in a user's manual supplied with the unit. In these cases, the relevant technical information and contacts should be available from the suppliers or vendors of this equipment instead of the many users (often car business service company, mom & pop operation, or a farmer).

For purposes of compliance with 9.2 or 13.2 of the *Code*, specifically clauses (h) in both Schedules 1 and 2, AENV is prepared to accept the information required in the application for registration from the manufacturer, supplier or a Professional Engineer.

12. ANALYTICAL REQUIREMENTS

Section 3 of the *Code* includes information on test methods and accreditation requirements that are familiar to most laboratories. Section 10 identifies the parameters and quality that have to be met by *alternate fuel* burned in Alberta. Criteria are similar to what is being used elsewhere in other North American jurisdictions. The definition of alternate fuel includes the identification of common suitable fluids. The parameters to be measured on representative samples of *alternate fuel* are identified in Table 10-1. The frequency and parameters to be tested are case dependent and dictated by the nature and origin of the recyclable from which alternate fuel will be produced. Details on the rationale for decision-making are described in subsections 12.1 to 12.6 of this *Guide*.

The accreditation required from the Standards Council of Canada (SCC) includes those cases where a laboratory is accredited, for the specific parameter analyzed, by an organization designated for that purpose by the SCC. This includes methods used by the Underwriters' Laboratories of Canada, the organizations identified in the *Code*, or any other method authorized in written by the Director. The limit of detection for the specific parameter tested needs to be well below the limit indicated in Table 10-1 of the *Code*.

12.1 Heavy Metals (As, Cd, Cr, and Pb)

The level of heavy metals in alternate fuel is regulated in a manner that reflects maximum allowable limits in alternate fuel produced from used lube oil from internal combustion engines that has not been otherwise mixed or contaminated with unknown chemicals. The presence of metals in used oil, including zinc and copper, is due to their role as additives, inhibitors, and to the wear and tear of the engine components with which the oil interacts.

Lead had been used in gasoline since the 1930s to improve engine performance as an anti-knock, octane-boosting gasoline additive. Lead had also provided lubrication of the engine valve seats, allowing car manufacturers in the past to use low-grade soft metals.

The phase out of lead additives in gasoline and to a lesser extent the elimination of lead solders has led to a continuous decrease of lead in used lube oil from well over 350 mg/L to less than 50 mg/L at the present.

12.2 Ash Residue

The metal content in the exhaust gases from burning units correlates with the suspended and dissolved solids present in the *alternate fuel* (i.e., in most cases decanted used lube oil). Consequently, a limit on the ash residue effectively controls the allowable level of salts, metals, rust and other matter present in the fuel and in particulate matter released from the burning units and space heaters. The ash residue limit has been set at 1.0% weight-by-weight, which is met by

most lube oils after normal use. The 1.0% value has been determined by taking into account ASTM D6448-99 Standard Specification for Industrial Burner Fuels from Used Lubricating Oils. High levels of ash residue damage burner system components and have negative impact on the performance of that system.

12.3 Halogenated Organic Compounds

The total concentration of halogenated organic compounds is set at 1000 milligrams per litre (mg/L) instead of 1500 mg/L used elsewhere in Canada and the US. The limit recognizes the presence of organic halogens in used oil as produced due to additives and also limits illegal mixing, blending or dilution of halogenated solvents with used oil.

12.4 Polychlorinated Biphenyls (PCB)

The maximum allowable concentration for PCB in products is now 2.0 mg/L to reflect the new federal *PCB Regulations* and to ensure compliance with the *Canada Wide Standards for Dioxins and Dibenzofurans* without requiring expensive stack surveys. That limit shall not be met through dilution of fluids with higher concentrations of PCB.

Should testing for PCB be routinely done in used lubricating oil? Spent lube oils are not expected to contain PCB, unless the oil has been improperly managed. As long as the person responsible states in writing that there are no PCB present, then no routine testing for this parameter shall be required. On the other hand, PCB testing of used oils or recyclables going into *alternate fuel* shall be done as per Section 12 of the *Code* when these fluids are from unknown, uncontrolled or suspected sources that meet at least one of the following conditions:

- contain or are suspected of containing residual PCB dielectric fluids from electrical equipment such as transformers;
- are from non-identifiable sources or origin such as uncontrolled bottle depots or landfills accepting third party waste;
- are imported into Alberta;
- the *alternate fuel* is to be exported; or
- the person responsible does not identify in the application the source of the spent lubricating oil or other recyclables used to produce *alternate fuel*.

12.5 Flash Point

The flash point is the lowest temperature at which a liquid or solid gives off enough vapor to form an ignitable air-vapor mixture near its surface. The higher the flash point, the less likely the fuel is to burst into flames when it contacts a spark or flame.

The minimum acceptable value for this parameter – 38.0° Celsius – is included for safety reasons to prevent the use of highly flammable fuels in other than industrial settings. It is a safety concern rather than an environmental one. There is no minimum limit for the flash point of alternate fuel consumed in controlled industrial combustion units.

12.6 Net Heat Value

The heat value of lube oil is about 46 520 kilojoules per kilogram (or 20 000 BTU per pound). This is almost four times higher than the minimum required from alternate fuel. Consequently, when we know the hydrocarbon fraction present in a recyclable, it is easy to estimate the heat value of the recyclable without any lab testing and assess the value against the limit in Table 10-1 of the *Code*. More generally, it suffices to know the net heat value of combustion of the combustible substance(s) and the fraction present in the recyclable, candidate to alternate fuel, to find out whether testing for the heat value is required or not.

12.7 Other Parameters

Sporadically, there might be a need to expand the suite of analytical parameters required for testing. The source and nature of the recyclables used in producing alternate fuel would dictate when other chemicals might be present. One example might be oily tank bottoms from API separators or oil and gas exploration. In these cases it makes sense to also test for salt as its presence may require control to avoid corrosion of equipment.

13. DESIGN/INSTALLATION OF BURNING UNITS

Section 4 of the *Code* includes design and installation of burning units and fuel tank storage requirements. The design and installation of space heaters and combustion units have to respect CSA code requirements for oil burning equipment and oil burners. Fuel storage tank requirements are set in Part 4 of the *Alberta Fire Code (AFC)* and in CSA B139-04 Code. Fuel oil tank installations of any size underground and above ground installations over 2500 litres (550 gallons) have to comply with and register under the *AFC*. For registration and installation details contact the Petroleum Tank Management Association of Alberta toll free at 1-866-222-8265 or on-line at www.ptmaa.ab.ca.

Heating equipment available in the market generally respect CSA standards, and users have to ensure that in terms of equipment capability the quality of the alternate fuel required by Section 10 of this *Code* is respected. Underwriters' Laboratories of Canada (ULC) and U-CL test equipment to meet CSA requirements.

13.1 Space heaters and combustion units

Space heaters and combustion units that burn alternate fuel (i.e., most times, used oil) must comply with *CAN/CSA B140-M97, General Requirements for Oil Burning Equipment*, and *CAN/CSA B140.2.1-M90 (R1995), Oil Burners; Atomized Type*, published by the CSA, as amended, or other standards specified in writing by the Director. The installation of combustion units or space heaters that burn *alternate fuel* prepared from used oil must comply with *CAN/CSA B139-04, Installation Code for Oil-Burning Equipment*.

As per section 4 of the *Code*, information on the design, construction and installation of space heaters and combustion units is not required in the application for registration (Schedule 1 or Schedule 2 of the *Code*). To meet

registration application requirements on this regard it is enough to prove that this equipment meets CSA standards because an approved organization or laboratories, like CSA, or ULC have tested it.

13.2 Storage Tanks and Containers

The AFC requires registration of any size underground storage tanks and above ground storage tanks exceeding

- a maximum individual capacity over 2,500 L (550 gal), or
- a maximum aggregate capacity of 5,000 L (1,100 gal).2,500 litres.

In addition, storage tanks and containers used for flammable and combustible fuels as defined by the AFC (i.e., fuels with a flash point less than 90.3^o Celsius) should be provided with secondary containment to contain leaks or spills, including the water used for fire fighting purposes, as required by the AFC.

13.2 Installation of Oil-Burning Equipment

Though exempt from the AFC, oil-burning equipment and associated piping and fittings still have to meet AFC Part 4 standards on the design, construction, locations, quantities, layout and other requirements, as applicable. For detail, please check Part 4 of the AFC.

On the other hand, the installation of oil-burning equipment, including fuel storage tanks and containers with a capacity below the above mentioned limits, and the piping and tubing systems from the tanks to the oil-fired appliance, is subject to *CAN/CSA B139-04 Installation Code for Oil-Burning Equipment*.

13.3 Secondary Containment

The WCR, in Table 3 of the *Alberta User Guide for Waste Managers* states that lube oil removed from internal combustion engines is a hazardous recyclable (Waste Type 201). Therefore, used oil received from generators is a hazardous recyclable and secondary containment is required when storing this substance (ss 11, 18 and 42 of the WCR and definition 3.11 of this Guide).

In addition, the AFC requires secondary containment for tanks or containers holding flammable and combustible fuels (i.e., fuels with a flash point less than 93.3^o Celsius).

Secondary containment may be achieved through a variety of means, which may include but not be limited to double wall tanks or secondary containment systems with at least 110% of the capacity of the primary container, bermed or diked areas, etc. Single wall tanks that meet AFC or the *Installation Code for Oil-Burning Equipment (B-139-04(R2009))*, as applicable, located within an enclosed structures also meet the secondary containment requirements of the WCR.

14. MONITORING REQUIREMENTS

A registration holder who produces alternate fuel shall collect one representative sample from each tank prior to shipment or use for the first time and split this sample in two subsamples. Thereafter, the frequency of sampling is once every three years. Analyse one sample for the parameters specified in Table 10-1, as

applicable, and keep the other sample for a period of three months should a need arise to re-analyse the sample.

For wastes burned as fuel, the person responsible for the waste should collect a representative sample from the candidate waste to be burned as fuel; test it for the parameters in Table 14-1 or any other as dictated by the nature of the waste and as needed for characterization and classification.

15. RECORD KEEPING/REPORTING REQUIREMENTS

Section 6 of the Code of Practice specifies the information that must be recorded and submitted by the registration holder to the Director or inspector when a contravention occurs while producing alternate fuel or burning waste as fuel. Routine records of data collected as per the Code design and operational requirements should be kept and made available to Alberta Environment as requested. It is not necessary to submit these records to Alberta Environment on a regular basis; however the records must be kept for a minimum of five years from the date that the information was recorded.

16. AMENDMENT OF THE CODE OF PRACTICE

The Code of Practice may be amended from time to time to address issues and problems that are identified, as well as changes to technology and standards. To assist in these amendments, persons with concerns and comments can provide them in writing to the Director for consideration and review.

17 MORE INFORMATION ON THE CODE OF PRACTICE

More information about this *Code* including contacts, addresses and telephone numbers of AENV regional offices are available at www3.gov.ab.ca/env/contact/index.html.

APPENDIX 1

FREQUENTLY ASKED QUESTIONS

1. *When does the Code apply to me?*

When you produce alternate fuel from an amount of recyclables that does not exceed 10 tonnes per month, or when you burn any quantity of waste as fuel, except when the waste is used oil generated on-site in an amount that does not exceed 4,500 litres per year.

Most alternate fuel is derived from used lube oil (i.e., engine crankcase oil) with or without further processing but tested to ensure compliance with the quality criteria of Table 10-1 of the *Code*.

2. *Do space heaters and combustion units THAT BURN ALTERNATE FUEL require registration or approval under EPEA?*

NO. In Alberta, space heaters and combustion units that burn *alternate fuel* do not require authorization under *EPEA* to burn this *fuel*. The production of *alternate fuel* is already controlled through *EPEA* approvals or registrations and, as such, no additional *EPEA* approval or registration is required for on-site or off-site units that burn this fuel [*ADR*, Schedule 1, Division 1, clause (c)] or registered (*ADR*, Schedule 2, Division 1, clause (d)(i)). (see definition 3.1 of *alternate fuel*)

3. *I have a registration under the drafts of the Code of Practice for the Production of Alternate Fuel and the Burning of Fuel Derived from Waste obtained from AENV in 2002. Do I have to re-apply again for a registration under the new Code of Practice for Energy Recovery?*

NO. Persons who hold a registration under any of the Draft Codes that preceded the *Code of Practice for Energy Recovery* do not require another registration under this *Code*. However, they should become familiar and ensure compliance with the current *Code*. Previous draft Codes circulated by AENV included:

- *Draft Code of Practice for the Production and Burning of Alternate Fuel* (1998-2000),
- *Draft Code of Practice for the Production of Alternate Fuel and the Burning of Fuel Derived from Waste* (2000-2002), or
- *Draft Code of Practice for Energy Recovery* (2003-05).

4. *A person who generates and burns less than 4500 L of used oil had the oil tested according to Table 10-1. Can he apply for the AUOMA return incentive even if he is exempt under the Code of Practice?*

YES. If the used oil has been tested, why not get some money back from AUOMA? The decision on applying should be based on balancing the testing costs against the AUOMA incentive.

5. *Is an MSDS required for producers of alternate fuel who do not supply it to a third party? In another words, if they use it on-site for energy recovery?*

YES. To obtain a registration, the producer has to develop a MSDS pursuant section 11.1 of the *Code*. Critical information includes analytical data from testing a representative sample of the *alternate fuel*. Third parties need to receive a MSDS from the producer. Also, check section 11.2 of the *Code* to see if a manifest is required when exporting *alternate fuel*.

6. *Does the Director need to be notified of changes in the volume of used oil generated?*

The registration holder who produces alternate fuel shall provide written notice to the Director within fourteen days of any significant change on the items identified in section 9.3 of the *Code*. That does not include volumes of used oil generated but rather volumes of recyclables collected to produce alternate fuel on a monthly basis.

7. *How much is it going to cost me to comply with the Code?*

It varies. For a producer of *alternate fuel* from used oil the initial cost reflects the analytical work needed to satisfy section 10. Testing of used oil for all the parameters identified in Table 10-1 may cost about \$500/sample. Testing for metals alone may cost about \$150/sample. Similar amounts will be disbursed once every five years thereafter or as often as there is a change on the nature of the feedstock used to produce alternate fuel.

When the alternate fuel is derived from a recyclable feedstock or product of known chemistry, for instance, canola oil or tallow oil, then there is no need to do analytical work to prove compliance with the limits of Table 10-1. A signed statement by the person responsible suffices regarding the description, origin and quantities of the feedstock.

8. *What burning units meet the requirements of the Code?*

CSA approved units do so. This includes equipment certified by Underwriters Laboratories of Canada or any other organizations also recognized by CSA.

9. *Why are there new standards?*

There are no new standards introduced with the publication of this code. Some changes on the parameters and limits involved have taken place, such as the water and sediment content of alternate fuel that was included in previous draft versions of this *Code*. The limit in those versions was for administrative rather than environmental reasons.

10. What do I need to do to meet the new standards?

For used oil, it is prudent to avoid mixing the used oil with oily sludges containing heavy metals or chlorides, anti-freeze (i.e., to inflate volumes), halogenated hydrocarbons, and organic solvents with a low flash point. Adding these substances may cause combustion problems or damage to the equipment. For used oils, simple settling and water removal will do the job in most cases.

When considering other suitable organic liquids find out the source and processes involved in the generation of these substances and define the required processing, accordingly, and by taking also into account the specifications of the fuel-burning equipment.

11. If I only burn used crankcase oil, is there any new requirements here?

No new requirements when you burn used oil. No registration is required when one person burns 4500 L or less per year. Written statement and registration with AUOMA is needed for entitlement to a rebate. Over this limit, registration with AENV is required when producing alternate fuel from used crankcase oil, burning it on-site, and claiming a rebate from the AUOMA.

12. Can I still run my furnace as usual with a 2003 registration?

YES, you can still run your furnace. Any previous registration is valid under the Code.

13. If I burn crankcase oil that includes other stuff like used grease, transmission fluid, brake fluid, power steering fluids, and antifreeze, are there any new requirements for me?

You have to test a representative sample and comply with the criteria in Table 10-1. You can still run your furnace as usual provided that the criteria are met, processing the oil if needed. If you cannot meet the Table 10-1 limits, then you may register under Part C of the Code and “burn waste as fuel” provided that you comply with Part C of the Code.

14. Should I test for PCB as per Table 10-1?

Even though Table 10-1 identifies a maximum concentration for PCB in *alternate fuel* there is no need to routinely test for PCB when the used oil is generated on-site or the generator states in writing that no PCB fluids are present in the used oil. Testing for PCB may be conducted for compliance, when there is uncertainty on the origin and quality of the used oil, or for import-export. For more detail check section 12.4 of this Guide.

15. Which form do I use?

The appropriate application form is identified in either Schedule 1, which deals with the production and processing of liquids suitable to prepare *alternate fuel*, or in Schedule 2. This one is to be completed when the intent is to burn a particular waste or recyclable as fuel. For instance, this might be the case of an off-spec batch of polystyrene from a chemical plant. Given its chemistry and high heat

value, this material is quite suitable to be used as a source of energy by burning under controlled conditions in specific industrial combustion units. The applicable form should be completed and submitted to the local Alberta Environment regional office to obtain a registration.

16. What requirements do space heaters and combustion units have to respect when burning alternate fuel?

AENV regulates the production of alternate fuel. AENV does not regulate space heaters or combustion units. Proving that the design and installation of space heaters or combustion units meet applicable *CSA* standards is what is required in the application for registration.

17. Does a burning unit using alternate fuel require registration under the Code?

No. *EPEA* regulates the production of *alternate fuel* not its use.

18. What are the requirements to respect when I store liquid hazardous recyclables (including used oil)?

The storage of hazardous wastes/recyclables and fuels has to comply with sections 11 or 18 of the *Waste Control Regulation*. Similarly, the *AFC* requires secondary containment for tanks or containers holding flammable and combustible fuels (i.e., with a flash point less than 93.3^o Celsius).

Secondary containment may be achieved through a variety of means, which include but are not limited to dual wall tanks or secondary containers with at least a capability to contain 110% of the capacity of the primary tank/container, bermed or diked areas, etc.

Single wall tanks that meet *Alberta Fire Code* or *CAN/CSA B-139-04* requirements, as applicable, located within an enclosed structure also meet the secondary containment requirements of the *WCR*.

Information on storage requirements is detailed in section 13 of this *Guide*. More detail is available in the *Waste Management Information for Businesses that Store Hazardous Waste and Hazardous Recyclables* at www3.gov.ab.ca/env/waste/rr/index.html, third bullet under “waste information sheets”.

19. How do I claim a rebate for used oil?

A copy of the registration obtained from Alberta Environment is used to claim the economic incentive from the Alberta Used Oil Management Association for the recycling of used oil. This incentive is available to producers of the alternate fuel, only. Those who buy *alternate fuel* prepared from used oil are not entitled to claim any rebate. This association can be reached at www.usedoilrecycling.com.

20. When do I need to register under the Fire Code?

Any underground fuel storage tank and aboveground fuel storage tanks over 2,500 litres capacity or greater require design and registration under the Fire

Code. To register these tanks contact the Petroleum Tank Management Association at www.ptmaa.ab.ca.

21. Do space heaters or combustion units that burn alternate fuel have to meet CSA standards? What about Underwriters' Laboratory of Canada (ULC) tested equipment?

Yes, a written statement in the application with the unit identification number, make, and model suffices. See section 4 of the *Code*. **Space heaters or combustion units burning this oil must be listed by ULC, C-UL, or CSA to the CAN/CSA B140 standard.** CSA does not conduct the tests. ULC tests equipment to meet CSA standards. For instance, there is no CSA approved chimney as there is no such thing. ULC is the only lab that tests chimneys to the CSA standard.

24. Is ULC the only recognized laboratory to test equipment to meet CSA standards?

No. There are three recognized labs that test furnaces to the CSA standard:

- ULC – Underwriters' Laboratories of Canada;
- C-UL – Canada-Underwriters' Laboratories; and
- CSA – Canadian Standards Association.

25. Does someone buying alternate fuel require registration?

No. Only the producer of *alternate fuel* needs to register under the *Code*. A person buying *alternate fuel* does not need to register to avoid double registration. He/she is not entitled to claim a rebate from AUOMA because the incentive is claimed by the recycler of the used oil (i.e., the producer of *alternate fuel*) and not the user, unless the producer and user is the same person.

26. Does CSA approve space heaters and combustion units?

No. CSA doesn't "approve" anything. They, and other labs, test products and equipment or provide accreditation to labs, products or equipment that meet the CSA standard.

27. What about the burning of waste which comes from the production of biodiesel?

Check the definition of *alternate fuel*. Subsection (v)(H) identifies animal fats or vegetable oils as potential alternate fuels.

28. Regarding (h) of Schedule 1, is a technical assessment by a professional engineer needed to assess a gravity induced phase separation system?

No. Physical, including gravity induced phase separation systems, is not considered “treatment”. As such these passive systems installed upfront of space heaters, boilers or other combustion units do not require an assessment by a professional engineer.

29. The ash residue limit is 1.0%. What happens if the oil fails this test?

Further gravity settling or filtration and re-testing may resolve this problem.

30 How to dispose of the ash produced when burning alternate fuel?

Ash resulting from the burning of alternate fuel prepared from used crankcase oil generally shows hazardous characteristics due to the metal content of used oil. Disposal options have to be assessed but generally small quantities (i.e., less than 5 kg per site and per month), properly contained, may be disposed of with regular garbage. Quantities exceeding 5 kg per month require treatment to a non-hazardous condition prior to disposal at the local Class II landfill. Larger quantities, again properly contained, have to go to a Class I landfill or treated to a non-hazardous condition. Ashes from the burning of other alternate fuels are classified based on their own merits. Most fluids candidate to alternate fuels do not contain persistent hazardous chemicals and the resulting ash, properly contained, may be disposed of at Class I or Class II sites.

31. Where in the Code is the limit on water and sediment (W&S)?

The limit of 3% for W&S included in previous draft Codes has been removed.

APPENDIX 2
REGISTRATION TEMPLATE

REGISTRATION

PROVINCE OF ALBERTA

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT

R.S.A. 2000, c.E-12, as amended

REGISTRATION NO. 999999-00-00

APPLICATION NO. 001-999999

EFFECTIVE DATE: July 10, 2007

REGISTRATION HOLDER LubeOil Does it All, Ltd.

REGISTRATION IS ISSUED FOR THE FOLLOWING ACTIVITY:

the construction, operation and reclamation of the energy recovery facility located at Hwy 999 - P.O. Box 999, Small Valley, Alberta Z0Y 0W0, for <<the production of alternate fuel ~**OR**~ for the burning of waste as fuel>>

IS SUBJECT TO THE CODE OF PRACTICE FOR ENERGY RECOVERY, SEPTEMBER 2005, AS AMENDED

Caesar Augustus

Designated Director under the Act

July 15, 2009

Date Signed