

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILE 8672

1335 SCOMM 50: HOUSE SPECIAL COMMITTEE ON STATE LOANS 1985-86

4. Sample Recovery Apparatus

- 4.1 Probe brush and nozzle brush - nylon bristle or equivalent at least as long as the probe liner and the nozzle respectively.
- 4.2 Wash bottles - inert to the solvent used in them (usually acetone).
- 4.3 Sample storage containers - glass with glass or Teflon¹ lined cap or other material which is leak tight, resistant to chemical attack from acetone and allows complete recovery of particulate matter.
- 4.4 Petri dishes - for filter samples, glass or plastic. Alternately, individual paper envelopes with waxed paper liners may be used, but tare and final weights should not be included in the weight of the envelope or liner.
- 4.5 Graduated cylinder and/or balance - to measure condensed moisture to within 1 ml or 1 g. Graduate cylinders shall have subdivisions of 2 ml or less and balances shall be sensitive to 1 g.
- 4.6 Plastic storage containers - air tight containers to store silica gel unless it is weighed at the sampling site or transported to the laboratory in the impinger.
- 4.7 Rubber policeman - to aid in recovering sample from the train previous to the filter.
- 4.8 Dessicator - laboratory type using Drierite¹, indicating dessicant or equivalent.
- 4.9 Analytical balance - accurate and sensitive to ± 0.1 mg.

5. Reagents

- 5.0 Separating funnel - 500-1000 ml with Teflon¹ stopcock and plug.
- 5.1 Beakers - 250 ml & 400 ml Pyrex¹ or equivalent.
- 5.2 Filters - glass fiber filters, without organic binder, of near neutral pH, free of pinhole leaks, and exhibiting at least 99.95% efficiency on 0.3 micron DOP smoke particles. MSA-11602H or equivalent, individually numbered for identification and pre-weighed as described in Section 6.1.
- 5.3 Silica gel - indicating type 6-16 mesh, dried at 175°C (350°F) for 2 hours if previously used.
- 5.4 Water - distilled, with a maximum total residue content of 0.001%. (0.01 mg/ml).
- 5.5 Acetone - reagents grade with a maximum total residue content of 0.001%. (0.01 mg/ml)
- 5.6 Crushed ice - any grade, crushed fine enough to provide efficient cooling for the impingers.

- 5.7 Stopcock grease - acetone resistant, heat stable, silicone grease.
- 5.8 Diethyl ether - reagent grade with a maximum total residue content of 0.001%. (0.01 mg/ml)
- 5.9 Chloroform - reagent grade with a maximum residue content of 0.001%. (0.01 mg/ml)

6. Sampling Train Preparation

- 6.1 Weigh numbered glass fiber filter paper to the nearest 0.1 mg on an analytical balance after dessication over Drierite for 24 hours or more.
- 6.2 Insert the filter into the filter holder and assemble taking care not to tear or bend the filter. Tighten the filter holder sufficiently to prevent leaks.
- 6.3 Add 100 ± 1 ml of distilled water to each of the first two impingers.
- 6.4 Add approximately 200 g of accurately weighed silica gel (± 1 g) to the fourth impinger.
- 6.5 Alternately after charging each of the impingers with the appropriate material, weigh the impinger and contents on balance to the nearest 1 g.
- 6.6 Assemble the train as shown in Figure 5-1 and check for leaks as in Section 8.
- 6.7 Seal the train with aluminum foil, a blanked connector or some other means to prevent contamination.

7. Pretest Preparations

- 7.1 Select a sampling site and the minimum number of traverse points as described in Source Sampling Method 1.
- 7.2 Determine the approximate moisture content as described in Source Sampling Method 4.
- 7.3 Make a preliminary pitot traverse to determine the maximum, minimum, and average pitot reading, duct temperature, and static pressure as described in Source Sampling Method 2.
- 7.4 Choose a nozzle size based on the range of pitot readings as described in Section 12 such that it is not necessary to change the nozzle size in order to maintain the isokinetic sampling rates for all traverse points.
- 7.5 Clean the chosen nozzle and probe (the shortest available which will reach all the traverse points), assemble and seal each end with aluminum foil to prevent contamination.
- 7.6 Attach the probe to the sample case, attach the electrical and hose

connections, and turn on the probe and filter heating system. Adjust the heater controls to maintain the appropriate temperatures.

8. Leak Check

- 8.1 Plug the inlet to the filter.
- 8.2 With the fine flow adjustment (bypass) completely open, open the coarse flow adjustment completely and adjust to a vacuum of 15 in. Hg by closing the fine flow adjustment.
- 8.3 After sufficient time has elapsed for stabilization, measure the leakage rate for 1 minute or more and record. A leakage rate of less than 0.02 cfm at 15 in. Hg is acceptable. Use acetone resistant stopcock grease on impingers and ball joints if necessary to seal against leaks.
- 8.4 Slowly remove the plug from the filter inlet and immediately close the coarse flow adjustment.

9. Particulate Train Operation

- 9.1 Each point should be sampled a minimum of 2 minutes and a complete set of data readings should be taken at every point. If each point is sampled more than 5 minutes, a complete set of data readings should be taken at equal intervals during the sampling of every point but not less frequent than every five minutes.
- 9.2 Pack crushed ice around the impingers, turn on the probe heater and adjust so that the gases leaving the probe are 250°F. Add ice occasionally during the test in order to keep the temperature of the gas leaving the train at 70°F or less.
- 9.3 Position the probe nozzle at the first traverse point (taking care not to allow the nozzle to touch the stack walls) and block off the openings around the probe. Record the initial gas meter reading, temperatures, static pressure and pitot reading on the Particulate Field Data Sheet (Figure 5-5).

Note: The probe should never be left in the stack when not sampling as particulate will be collected in the nozzle.

- 9.4 Calculate (as described in Section 12) and record the desired orifice setting, open the coarse flow adjustment and immediately start the timer.
- 9.5 As rapidly as possible, adjust the orifice reading using the coarse and fine flow adjustments to the desired reading.
- 9.6 At the end of the first sampling point (or not more than 30 seconds before) reposition the probe nozzle at the next sampling point.

Note the gas meter reading exactly at the end of the first time interval.

- 9.7 After the pitot readings have stabilized, note the pitot reading, calculate the desired orifice setting, and adjust with the fine and coarse flow adjustments to the new setting. This should be done as rapidly as possible to avoid anisokinetic sampling.
 - 9.8 Continue the above steps until all traverse points have been sampled at an equal interval of time (except adjusted traverse points as described in Source Sampling Method 1.)
 - 9.9 At the conclusion of the run, close the coarse flow adjustment, note the final gas meter reading and temperatures and withdraw the probe completely.
 - 9.10 Seal the nozzle with aluminum foil as soon as it cools sufficiently to do so, disconnect the probe from the sample case, seal all other openings and transport to the cleanup (or storage) area.
 - 9.11 Throughout the sample run, collect an integrated gas sample for composite analysis as described in Source Sampling Method 3.
 - 9.12 Under no circumstances disconnect or loosen any part of the airtight train until the probe has been completely removed from the stack.
10. Particulate Train Cleanup
- 10.1 Cleanup should be performed in an area free of wind and airborne dust which may contaminate the sample or cause sample loss. If possible, the train should be cleaned in a laboratory.
 - 10.2 After the probe and nozzle have cooled, remove the end seals and brush while rinsing with acetone into a suitable container (labelled).

Note: Exercise caution so that none of the rinse is lost and no extraneous material enters the rinse (such as from the pitot tubes).
 - 10.3 Should it be necessary to clean the train in the field, use the following procedure:
 - 10.3.1 Rinse all sample exposed surfaces prior to the filter (including the front half of the filter holder) with acetone. Remove any adhering particles with the aid of a rubber policeman. Place the rinsings in the probe rinse bottle.
 - 10.3.2 Remove the filter without disturbing the particulate cake, place in a petri dish and seal.
 - 10.3.3 Measure and record the volume (or weight) increase of the first three impingers and transfer their contents into a labelled container. Rinse the impingers and interconnects with distilled water and add to the container.

- 10.3.4 Rinse all sample exposed glassware between the filter (excluding the glass frit filter support) and the fourth impinger with acetone and store in a suitable marked container.
- 10.3.5 Determine the weight gain of the silica gel in the fourth impinger and record. Alternately transfer the silica gel quantitatively to an airtight container to be weighed in the laboratory.
- 10.3.6 Collected samples should be analyzed within one week of collection in order to prevent any possibility of biological or chemical degeneration.

11. Analysis

- 11.1 Dessicate the filter (in the field container) for 24 hours and weigh to constant weight.
- 11.2 Transfer the acetone rinse (Section 10.3.1) into a tared beaker or evaporating dish. Be sure all particulate is removed from the container. Evaporate the solvent at laboratory temperature and pressure, dessicate for 24 hours and weigh to constant weight (± 0.5 mg change in 6 hours or more).
- 11.3 Transfer the acetone rinse from the back-half (Section 10.3.4) to a tared beaker or weighing dish. Evaporate as in 11.2 and weigh to constant weight.
- 11.4 Transfer the water in the impingers to a separatory funnel (Teflon stoppered). Rinse the container with distilled water and add to the separatory funnel. Stopper and vigorously shake the separatory funnel 1 minute, let separate and transfer the chloroform (lower layer) into a tared beaker or evaporating dish. Repeat twice more. Repeat the above procedure using three 25 ml portions of diethyl ether in place of the chloroform.
- 11.5 Transfer the remaining water in the separatory funnel to a tared beaker or evaporating dish and evaporate at 105°C . Dessicate for 24 hours and weigh to constant weight.
- 11.6 Evaporate the combined impinger water extracts from Section 11.4 at laboratory temperature and pressure, dessicate for 24 hours and weigh to constant weight.
- 11.7 Evaporate portions of the solvents used in a manner similar to the sample evaporation to determine the solvent blanks.
- 11.8 Record all laboratory data on the Laboratory Data Reporting Sheet, Figure 5-9.

12. Ncmograph Operation

12.1 Correction factor

- 12.1.1 Determine ΔH for the orifice as described in the calibration Section 13.1
- 12.1.2 Estimate the probable meter temperature, T_m , often 20°F above ambient temperature, H_2O in stack gas, and P_s/P_m (ratio of absolute stack pressure to absolute meter pressure) as described in Section 7.

- 12.1.3 Determine the correction factor "C" using the correction factor nomograph, Figure 5-2a, as described on the nomograph. Correction of the factor "C" for a pitot C_p other than 0.35 can be made using the following equation:

$$C(\text{corrected}) = C \frac{C_p^2}{(0.35)^2}$$

12.2 Operating Nomograph

- 12.2.1 Adjust the sliding scale on the operating nomograph, Figure 5-2b, such that the "C" factor determined in Section 12.1.3 is opposite Reference Point A.
- 12.2.2 Using the preliminary pitot traverse data and duct temperature determined in Section 7, draw a line from T_s to the values of ΔP and select a suitable D (nozzle diameter) from the probe tip diameter scale.
- 12.2.3 Draw a line from T_s through D (actual diameter of nozzle to be used) and note where the line crosses the ΔP scale.
- 12.2.4 Draw a line from the ΔP obtained in 12.2.3 to Reference Point B on the ΔH scale and note where the line crosses the K factor scale. This point should be marked for future reference.
- 12.2.5 During sampling, align the pitot reading, ΔP , with the K factor setting, Section 12.2.4, to obtain the desired ΔH .
- 12.2.6 If T_s (absolute) changes by more than 50° F the K factor should be recalculated starting with 12.2.3.

13. Calibration

13.1 Orifice and dry gas meter

- 13.1.1 Connect the components as shown in Figure 5-3. The wet test meter is a 1 cf per revolution with $\pm 1\%$ accuracy and capable of operating at a rate comparable to the expected sampling rate.
- 13.1.2 Run the pump about 15 minutes at an orifice reading of about 0.5 in. H_2O to allow the dry gas meter and pump to warm up and to wet all interior surfaces of the wet test meter.
- 13.1.3 Gather the information as required in Figure 5-4.
- 13.1.4 Calculate γ and ΔH_0 as described in Figure 5-4. If an average γ of 1.00 ± 0.01 is not obtained, the dry gas meter must be adjusted. If an average ΔH_0 of 1.34 ± 0.25 is not obtained, the orifice opening should be enlarged or replaced. Additionally the ΔH_0 should not vary more than ± 0.15 over the range of operation of 0.5 to 2 inches of H_2O .

- 13.1.5 Calibrate the orifice and dry gas meter every month or after every 5 tests whichever occurs first.

13.2 Temperature gauges

- 13.2.1 Check temperature gauges against mercury-in glass thermometers of certified accuracy or against suitable temperature standards (boiling or freezing points) at least yearly.

13.3 Probe Nozzle

- 13.3.1 Measure the inside nozzle diameter on at least 10 different diameters - to the nearest 0.001 inch using a micrometer or caliper. The nozzle diameter is the average of these readings to the nearest 0.001 inches.
- 13.3.2 The largest deviation from the average should not exceed $\pm 1\%$ of the average diameter.
- 13.3.3 Calibrate the nozzle at least before every test.

14. Calculations

14.1 Gas velocity

- 14.1.1 Calculate the average gas velocity, V_s , from the pitot tube readings and gas temperatures using equation 5-2

$$(V_s)_{avg} = \frac{K_p C_p}{\sqrt{\frac{P_s M_s}{T_s}}} \sqrt{(\Delta P_s T_s)_{avg}} \quad (5-2)$$

Where the symbols and units are the same for equation 2-2 in Source Sampling Method 2.

14.2 Gas volumetric flow rate

- 14.2.1 Calculate the volumetric flow rate of the gas from the duct area and the average gas velocity using equation 5-3

$$Q_s = \frac{0.123 A_s (V_s)_{avg} (1-B_w) P_s}{T_s} \quad (5-3)$$

where the symbols and units are the same as equation (2-3) in Source Sampling Method 2.

14.3 Dry gas volume

- 14.3.1 Calculate the volume of gas sampled using equation 5-4

$$Q_d = \frac{17.65 Q_s (P_o + \frac{\Delta H}{13.6})}{T_m} \quad (5-4)$$

where Q_d = volume of gas sample, SDCF
 Q_m = volume of gas through meter (meter conditions), CF
 P_o = barometric pressure, absolute, in. Hg.
 ΔH = average pressure drop across the orifice, in. H_2O
 T_m = average dry gas meter temperature, $^{\circ}R$

- 14.3.2 In the event the gas passing through the dry gas meter was not dry, the above equation must be multiplied by $(1-B_{vm})$ where B_{vm} is the volume fraction of water in the metered gas (assume saturation at the temperature of the last impinger).

14.4 Moisture content of duct gas

- 14.4.1 Calculate the moisture content of the duct gas from the total volume of water vapor condensed using equations (5-5), (5-6), and (5-7).

$$Q_v = 0.0474 V_v \quad (5-5)$$

where Q_v = volume occupied by water vapor, SCF
 V_v = volume of water condensed in impingers and on silica gel, g or ml.

$$m_v = \frac{100 Q_v}{Q_d + Q_v} \quad (5-6)$$

where m_v = volume percent of moisture in the sampled gas.

$$m_d = \frac{Q_d}{Q_d + Q_v} = \frac{1 - m_v}{100} \quad (5-7)$$

where m_d = volume fraction of dry gas in the sampled gas

- 14.5 Calculate the molecular weight of the wet gas using the volume fraction of dry gas and the dry molecular weight using equation 5-8.

$$M_s = m_d M_d + 18 (1 - m_d) \quad (5-8)$$

where M_s = molecular weight of the wet stack gas, lb/lb mole

M_d = molecular weight of the dry stack gas as defined in Source Sampling Method 3, equation (3-2)

- 14.6 Calculate the total particulate grain loading and correct to 12% carbon dioxide (when necessary) from the volume of gas sampled, the total weight of particulate sample and the % CO_2 using equation 5-9, and 5-10.

$$C_g = \frac{0.0154 W}{Q_d} \quad (5-9)$$

where C_g = total particulate grain loading, gr/sdcf

W = weight of particulate sample, mg

$$C'_g = \frac{12 C_g}{\% CO_2} \quad (5-10)$$

where C'_g = total particulate grain loading corrected to
12% CO_2 , gr/SCCF @ 12% CO_2

% CO_2 = percent by volume carbon dioxide as determined
in Source Sampling Method 3.

14.7 Calculate the total particulate emission rate from the total particulate grain loading and the volumetric flow rate using equation 5-11

$$C_e = 0.00857 C'_g q_s \quad (5-11)$$

where C_e = total particulate emission rate, lbs/hr

q_s = Volumetric flow rate in duct, DSCFM as determined
in Source Sampling Method 2.

14.8 Calculate the percent of isokinetic sampling rate from equation 5-12.

$$I = \frac{1039 T_s Q_d}{V_s P_s m_d D_n^2 t} \quad (5-12)$$

where I = Percent of isokinetic sampling rate

T_s = Average stack temperature, °R

P_s = Average stack absolute pressure, in. Hg

D_n = Average nozzle inside diameter, in.

t = Total sampling time, min.

Q_d = Volume of gas sampled, SDCF

V_s = Average gas velocity, FPM

m_d = Volume fraction of dry gas

15. Minimum Acceptable Test Requirements

15.1 In order for a source test by this method to be acceptable as sufficiently accurate, the following requirements must be met unless otherwise indicated by the Department in writing:

15.1.1 A minimum sample volume of 60 SDCF of gas per run must be sampled.

15.1.2 A minimum run time of 60 minutes on continuous operations or one complete cycle covering at least 60 minutes on cyclic operations. A minimum of two runs per test is required.

15.1.3 The Department is notified in advance of all source tests so that it may have an observer present if desired.

15.1.4 All equipment used in the test shall be as specified in Section 3, 4, and 5.

15.1.5 All equipment used in the test shall be calibrated at the specified

interval or more often and the calibration data and results included in the test report.

15.1.6 Accurate description of the sampling site including photographs.

15.1.7 Sufficient data to confirm that the sampling rate was within $\pm 10\%$ of isokinetic.

16. Minimum Test Report Information - the following information concerning the source shall be included in the source test report.

16.1 Boilers

16.1.1 Name of manufacturer, nameplate capacity, and installation date of boiler and associated control equipment.

16.1.2 Control equipment on boiler (including cinder reinjection equipment).

16.1.3 Steam production rate, steam pressure and range of steam flow where possible. Use of a steam flow integrator is desirable.

16.1.4 Fuel composition (including estimated moisture content where applicable).

16.1.5 Opacity readings during or immediately after test by a certified reader.

16.2 Asphalt Plants (See Note 1)

16.2.1 Type, location and capacity of plant.

16.2.2 Control Equipment present.

16.2.3 Pressure drop across control equipment, water pressure on scrubber nozzles when present.

16.2.4 Production rate and type of mix during test.

16.2.5 Dryer fuel and firing rate.

16.2.6 Mix temperature (on drum mix plants)

16.2.7 Fines content of total aggregate feed.

16.2.8 Opacity readings during or immediately after test by a certified observer.

16.2.9 Photographs of plant in operation including plume after steam dissipation.

16.2.10 Special testing or production problems encountered.

NOTE 1: The source test requirements for asphalt plants constructed or modified after June 11, 1973 differ from this method in that only the particulate collected in the front half of the train (from the probe to the filter inclusive) is used for compliance evaluation. The impinger catch, however, must still be reported.

16.3 Incinerators

- 16.3.1 Manufacturer and capacity of incinerator.
- 16.3.2 Control equipment present.
- 16.3.3 Type and quantity of material incinerated.
- 16.3.4 Charging and stoking times.
- 16.3.5 Auxiliary fuel used and quantity consumed during test (measured).
- 16.3.6 Opacity readings during test by a certified observer.
- 16.3.7 Photographs of incinerator in operation including plume.

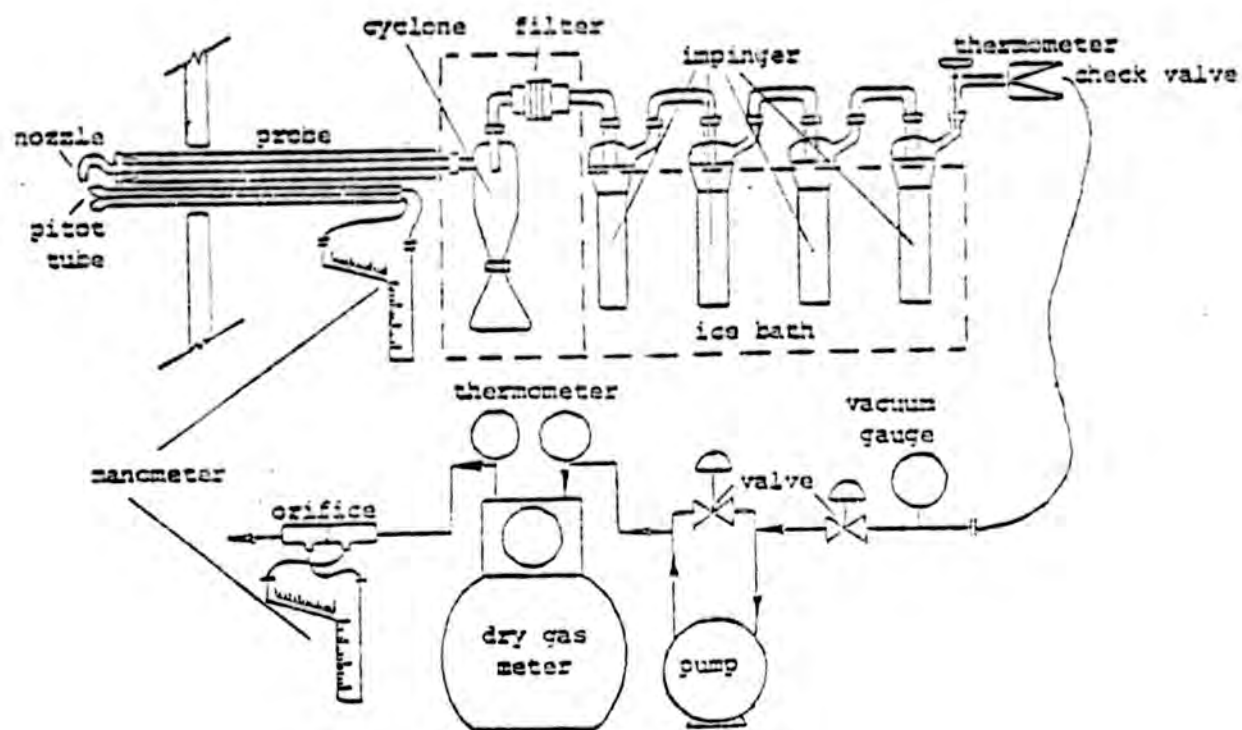


FIGURE 5-1



Figure 5-2 (a)

EXAMPLE: $A = 1.1$

$B = 100$

$C = 1.0$

FIND C 1.0

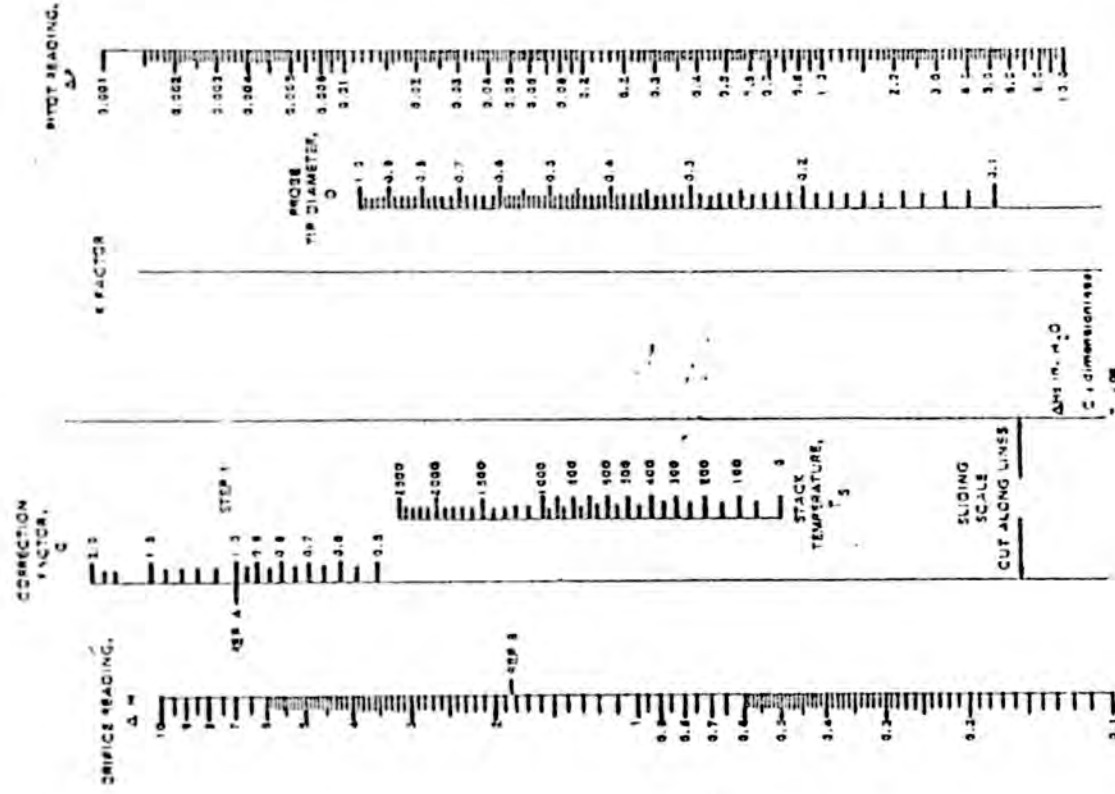


Figure 5-2 (b)

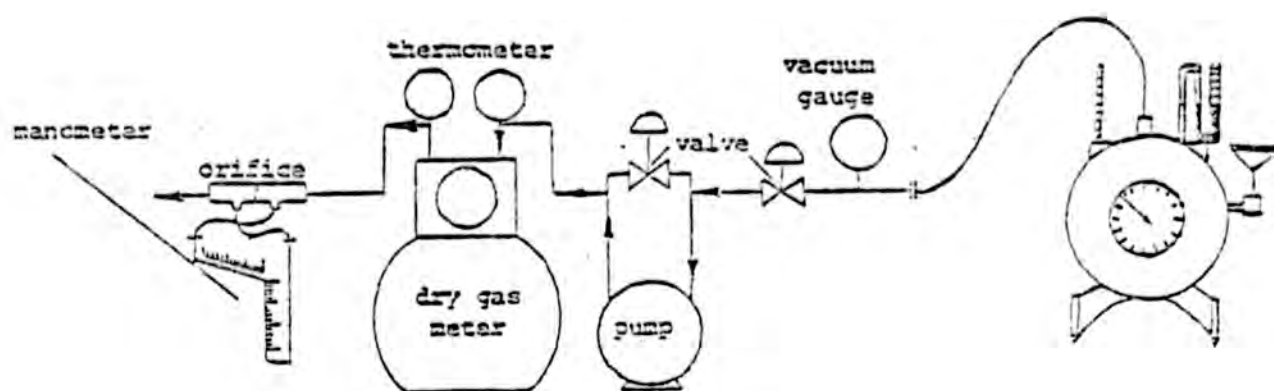
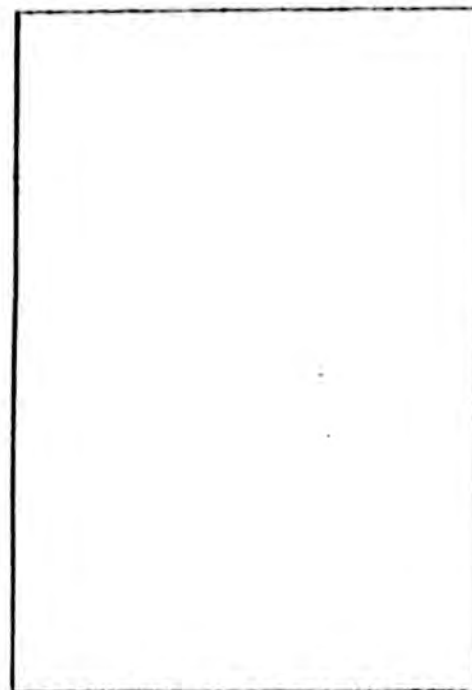


Figure 5-3

SOURCE SAMPLING FIELD DATA SHEET

Figure 5-5a

Plant _____
 Address _____
 Source _____
 Date _____ Run _____
 Train No. _____ Box No. _____
 Probe Length _____ Probe material _____
 Pitot C_p _____
 Findings:



Sketch of Sampling Site

DB Temp. _____ WD Temp. _____
 Assumed Moisture _____ P. baro _____
 Static Pressure _____ Alt _____
 "C" Factor _____ Nozzle _____
 Stack Dimensions _____
 Train Operator _____
 Box Operator _____

Orsat

CO ₂				
O ₂				
CO				

Other Samples:

Remarks:

Figure 5-5b

Run No. _____ Date _____
Plant _____
Sampling Location _____

Static Pressure, P_s _____ in. H_2O
Atmospheric Pressure, P_b _____ in. Hg
Stack Pressure, P_s _____ in. Hg
Dry Bulb Temp. _____ °F
Wet Bulb Temp. _____ °F
Moisture _____

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Figure 5-7

COMBUSTION GAS ANALYSIS DATA SHEET

Source _____ Date _____

Sampling Point Location _____

RUN _____

	CO ₂	O ₂	CO	N ₂	
Analysis 1	_____	_____	_____	_____	Time _____
Analysis 2	_____	_____	_____	_____	Test conditions: _____
Analysis 3	_____	_____	_____	_____	_____
Average	_____	_____	_____	_____	_____

	CO ₂	O ₂	CO	N ₂	
_____	Atomic Wt. (44)	Atomic Wt. (32)	Atomic Wt. (28)	Atomic Wt. (28)	
_____	+	_____	+	_____	= Total Atomic Wt.

RUN _____

	CO ₂	O ₂	CO	N ₂	
Analysis 1	_____	_____	_____	_____	Time _____
Analysis 2	_____	_____	_____	_____	Test conditions: _____
Analysis 3	_____	_____	_____	_____	_____
Average	_____	_____	_____	_____	_____

	CO ₂	O ₂	CO	N ₂	
_____	Atomic Wt. (44)	Atomic Wt. (32)	Atomic Wt. (28)	Atomic Wt. (28)	
_____	+	_____	+	_____	= Total Atomic Wt.

ARTICULATE SAMPLING CALCULATIONS

Plant _____

Sampling Location _____

Date of Test _____

FIGURE 5-3

PARAMETERS TO BE CALCULATED			RESULTS			
Symbol	Definition, Units	Calculating Equation	Run	Run	Run	Avg.
Qm	Sample gas volume at meter conditions, ft. ³	Avg. from field data sheet				
H ₂ O	% H ₂ O	Moisture escaping last impinger				
tm	Gas meter temp., °F	Avg. fr. field data sheet				
H	Orifice pressure drop in H ₂ O	Avg. fr. field data sheet				
Po	Barometric pressure (in. Hg)	Field data sheet				
Vv	Tot. vol. of condensed water	Total fr. lab data sheet				
Md	Molecular weight of dry gas	Gas analysis-Atomic Wt.				
Ps	Stack pressure in Hg abs	.07355 x Ps' + Po				
S	$\sqrt{VP \times 15}$	Avg fr. Vel calc. sheet				
Cp	Pitot Tube Coeff.	From Calibration Data				
As	Stack area (in. ²)	Field data sheet				
Ts	Stack temp., °R	Avg. fr. field data sheet				
Dm	Nozzle diameter (in.)	Field data sheet				
t	Total sampling time, min.	Total fr. field data sheet				
W	Wt. of particulate sample, mg	Total fr. lab data sheet				
%CO ₂	% CO ₂	CO ₂ analyzer				
Qd	Dry gas sample vol. at std. cond., scf	$Qd = \frac{17.65 (Qm)}{(tm-460)} \left[\frac{Po - \frac{\Delta H}{13.6}}{13.6} \right]$				
Qv	Tot. vol. of condensed water vapor @ std cond. (scf)	$Qv = 0.0474 Vv$				
mv	% moisture in stack gas	$mv = \frac{100 Qv}{Qv + Qd}$				
md	Mole fraction of dry gas	$md = \frac{Qd}{Qv + Qd}$				
Ms	Molecular wt. of stack gas	$Ms = mdMd + 18 (1-md)$				
Vs	Stack velocity at stack, fpm	$Vs = 5129 (Cp)(S) \sqrt{\frac{1}{PsMs}}$				
qs	Stack flowrate at standard cond., scfm	$qs = \frac{0.123 (Vs)(As)(md)(Ps)}{Ts}$				
I	Percent Isokinetic	$I = \frac{1039 Ts Qd}{(Vs)(Ps)(md)(Dn^2)(\Delta t)}$				
Cg	Total particulate grain load., gr/scf	$Cg = \frac{0.0154 W}{Qd}$				
Cg'	Grain load. at 12% CO ₂ gr/scf	$Cg' = Cg \times \frac{12}{(\% CO_2)}$				
Ct	Total particulate emission lb/hr.	$Ct = .00857 (Cg')(qs)$				

Figure 3-3 (Revised)

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY CONTROL DIVISION

PARTICULATE SAMPLING CALCULATIONS

Plant _____ Sampling Location _____

Date of Test _____

Sym- bol	Definition, Units	Calculating Equation	Run	Run	Run	Avg.
Qm	Sample gas volume at meter conditions, ft. ³	Avg. from field data sheet				
tm	Gas meter temp., °F	Avg. from field data sheet				
H	Orifice pressure drop in H ₂ O	Avg. from field data sheet				
Po	Barometric pressure (in. Hg)	Field data sheet				
Vv	Tot. vol. of condensed water	Total fr. lab data sheet				
Md	Molecular weight of dry gas	Gas analysis-Atomic Wt.				
Ps	Stack pressure in Hg abs	.07355 x P _s + Po				
S	$\sqrt{\frac{P}{\rho} \times T_s}$	Avg. fr. Vel. calc. sheet				
C _p	Pitot Tube Coeff.	From calibration data				
As	Stack area (in. ²)	Field data sheet				
Ts	Stack temp., °R	Avg. fr. field data sheet				
Dm	Nozzle diameter (in.)	Field data sheet				
Δt	Total sampling time, min.	Total fr. field data sheet				
W	Wt. of particulate sample, mg.	Total fr. lab data sheet				
%CO ₂	% CO ₂	CO ₂ analyzer				
Qd	Dry gas sample vol. at std. cond., scf	$Qd = \frac{17.65(Qm)}{(273 + tm)} \left[\frac{Po - H}{13.6} \right]$				
Qv	Tot. vol. of condensed water vapor at std. cond. (scf)	$Qv = 0.0474 Vv$				
mv	% moisture in stack gas	$mv = \frac{100 Qv}{Qv + Qd}$				
md	Mole fraction of dry gas	$md = \frac{Qd}{Qv + Qd}$				
Ms	Molecular wt. of stack gas	$Ms = mdMd + 18 (1 - md)$				
Vs	Stack velocity at stack, fpm	$Vs = 5129 (Cs) (S) \left[\frac{1}{Ps - Ps_{std}} \right]^{\frac{1}{2}}$				
qs	Stack flowrate at standard cond., scfm	$qs = \frac{0.123 (Vs) (As) (md) (Ps)}{Ts}$				
I	Percent Isokinetic	$I = \frac{1039 Ts Ts_2}{(Vs_1 (Ps_1) (md) (7.2) (\Delta t))}$				
Cg	Total particulate grain load, gr/scf	$Cg = \frac{0.0154W}{Qd}$				
C _g ¹²⁴	Grain load, at 124 CO ₂ gr/scf	$Cg^1 = Cg \times \frac{124}{100 - CO_2}$				
Ct	Total particulate emission lb/hr	$Ct = .00857 (Cg) (qs)$				

Figure 5-9

SOURCE SAMPLING-LABORATORY ANALYSIS OF PARTICULATE SAMPLE

Test _____
 Date of Test _____

CONDENSED WATER DETERMINATION

Run No.	Impinger:	#1	#2	#3	#4	Total Condensate
	Final weight					
	Initial weight					
	Net weight					
	Final weight					
	Initial weight					
	Net weight					
	Final weight					
	Initial weight					
	Net weight					

GRAVIMETRIC RESULTS

Run No.	Contents	Filters, Probe & Filter Holder	Impinger Rinse	Impinger Extract	Impinger Water	Total Wt.
	Beaker No./Vol.					
	Gross wt.					
	Tare wt.					
	Net wt.					
	Blank wt.					
	Final wt.					
	Beaker No./Vol.					
	Gross wt.					
	Tare wt.					
	Net wt.					
	Blank wt.					
	Final wt.					
	Beaker No./Vol.					
	Gross wt.					
	Tare wt.					
	Net wt.					
	Blank wt.					
	Final wt.					

Sample Preparation: Volatiles evaporated at _____ C, Duration _____ hrs
 Water evaporated at _____ C, Duration _____ hrs
 Desiccated at _____ C, Duration _____ hrs
 Laboratory Balance Type _____

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
Source Sampling Method 7

Sampling Condensable Emissions From Stationary Sources

1. Principle and Applicability

- 1.1 Principle: Particulate matter including condensable gases is withdrawn isokinetically from a flowing gas stream. The particulate matter is determined gravimetrically after extraction with organic solvents and evaporation.
- 1.2 Applicability: This method is applicable to stationary sources whose primary emissions are condensable gases. It should be considered a modification of Source Sampling Method 5 and applied only when directed to do so by the Department.

2. Sampling Apparatus (Figure 7-1)

- 2.1 The probe, sampling train, and metering system are the same as outlined in 3. Sampling Apparatus of Source Sampling Method 5 with the following exceptions:
 - 2.1.1 The heated filter and cyclone are optional, but should be used if significant quantities of solid particulate are present.
 - 2.1.2 An unheated glass fiber filter is placed between the third and fourth impingers.

3. Sample Recovery Apparatus

- 3.1 The sample recovery apparatus is the same as outlined in 4. Sample Recovery Apparatus of Source Sampling Method 5.

4. Reagents

- 4.1 The reagents are the same as outlined in 5. Reagents of Source Sampling Method 5.

5. Sampling Train Preparation

- 5.1 The sampling train preparation is the same as outlined in 6. Sampling Train Preparation of Source Sampling Method 5 with the following exception:
 - 5.1.1 Insert numbered and weighed filters into each of the front (if used) and rear filter holders.

6. Pretest Preparations and Leak Check

- 6.1 The pretest preparations and leak check are the same as outlined in Sections 7 and 8 of Source Sampling Method 5.

7. Condensible Particulate Train Operations

- 7.1 The train operation is the same as outlined in Section 9 of Source Sampling Method 5. It is important to note that the gas temperature leaving the last impinger must not exceed 70°F as temperatures above this may cause loss of condensible material by revolatilization.

8. Condensible Particulate Train Cleanup

- 8.1 Cleanup should be performed in an area free of wind and airborne dust which may contaminate the sample or cause sample loss. If possible, the train should be cleaned in a laboratory.
- 8.2 After the probe and nozzle have cooled, remove the end seals and brush while rinsing with acetone into a suitable marked container.

Note: Exercise caution so that none of the rinse is lost and no extraneous material enters the rinse (such as from the pitot tubes or condensed material from the outside of the nozzle).

- 8.3 Should it be necessary to clean the train in the field, use the following procedures:

- 8.3.1 Thoroughly rinse all sample exposed surfaces prior to the front filter support, with acetone. Remove any adhering particles with the aid of a rubber policeman. Place the rinsings in the probe rinse bottle. If the front filter is not used, all sample exposed surfaces prior to the first impinger should be included in this rinse.
- 8.3.2 Remove the front (if used) and rear filters, place in a petri dish and seal. Since a heavy loading of condensible material on the rear filter may leave a residue in the filter container which would necessitate removal with solvent, glass petri dishes are preferred.
- 8.3.3 Measure and record the volume (or weight) increase of the first three impingers to the nearest 1 ml (or 1 g) and transfer their contents to a labeled container. Rinse the impingers and interconnects with distilled water and add to the container.

- 8.3.4 Rinse all sample exposed glassware between the front filter (if used) or the first impinger (if the front filter is not used) and the fourth impinger (including glass filter frits) with acetone and place in a suitable marked container. If the moisture condensate in Section 8.3.3 was determined by use of a graduated container, it should also be rinsed with acetone and the rinse added to the impinger rinse container.
- 8.3.5 Determine the weight gain of the silica gel in the fourth impinger and record. Alternately transfer the silica gel quantitatively to an air tight container to be weighed in the laboratory.
- 8.3.6 Collected samples should be analyzed within one week of collection in order to prevent any possibility of biological or chemical degradation.

9. Analysis

- 9.1 Desiccate the filter(s) at 70°F or less in the field container for 24 hours and weigh .

Nota: In some cases, desiccation may give rise to a slow vaporization of the condensable material. Therefore it is not recommended that an attempt to weigh to constant weight be made.

- 9.2 Transfer the acetone rinse (Section 8.3.1) into a tared beaker or evaporating dish. Rinse the container with acetone (police to remove particulate) and add the rinse to the beaker. Evaporate the solvent at 70°F or less and laboratory pressure, desiccate 24 hours and weigh . See note in Section 9.1.
- 9.3 Transfer the acetone rinse from the impingers (Section 8.3.4) to a tared beaker or evaporating dish and treat as in Section 9.2.
- 9.4 Transfer the water (Section 8.3.3) to a separatory funnel. Rinse the container with distilled water and add to the separatory funnel. Add 25 ml of chloroform to the separatory funnel, stopper and vigorously shake 1 minute, let separate and transfer the chloroform (lower layer) into a tared beaker or evaporating dish. Repeat twice more. Repeat the above extraction using three 25 ml portions of diethyl ether in place of the chloroform. Transfer the ether (upper layer) to the same container as used to contain the chloroform.

Nota: It is necessary to rinse the field container for water (if used) with solvent. This rinse may be made using the extracting reagents in which case it is added to the impinger extract container or with acetone in which case it is added to the container in Section 9.3.

- 9.5 Transfer the remaining water from the separatory funnel to a tared beaker or evaporating dish and evaporate at 105°C . Desiccate for 24 hours and weight.
- 9.6 Evaporate the combined impinger water extracts from Section 9.4 at 70°C or less and laboratory pressure, desiccate for 24 hours and weigh . See note in Section 9.1.
- 9.7 Evaporate portions of the solvents used in a manner similar to the sample evaporations to determine the solvent blanks.
- 9.8 Record all laboratory data in the Laboratory Data Reporting Sheet, Figure 5-9, Source Sampling Method 5.

10. Calculations

- 10.1 The calculations are the same as outlined in 14. Calculations of Source Sampling Method 5.

11. Minimum Acceptable Test Requirements

- 11.1 The minimum acceptable test requirements are the same as outlined in 15. Minimum Acceptable Test Requirements of Source Sampling Method 5.

12. Minimum Test Report Information

- 12.1 The test report should contain sufficient information about the source to accurately define its operation during the test. Also sufficient data and calculations shall be included to document the source test results.

Appendix 1 - Errata (12-12-84)

1. Subsection 3.4.1, page 3; delete "shielded" in first sentence.
2. Subsection 3.10.1, page 5; replace "relative humidity" with "wet and dry bulb temperatures and barometric pressure."
3. Subsection 3.12.5(a), page 7; "rotometer" is misspelled in the first sentence. The correct spelling is "rotameter."
4. Subsection 3.12.5(a), page 7; replace "such as a dry or wet gas meter or an accurate volume (displacement)" with "(dry gas meter) or an accurate volume displacement device (wet test meter)."
5. Subsection 6.3.1(a), page 18: "rotometer" is misspelled in the first sentence.
6. Subsection 6.3.1(a), page 18; the third impinger should not contain silica gel, therefore, the last sentence in the first paragraph, should read "Impingers one, two and three shall be empty for water collection."
7. Equation 6.3.1(a), page 18;
$$\text{"Flow(cfm)} = \frac{I_r}{D_c} \times \frac{1}{60} \times \frac{T_r}{P_r \times 17.65^a}$$

should read:
$$\text{"Flow(dscfm)} = \frac{I_r}{D_c} \times \frac{1}{60} \times \frac{P_r \times 17.65}{T_r}$$
8. Equation 6.3.1(a), page 18; "rotometer" is misspelled on the last line.
9. Footnotes to equation 6.3.1(a), page 19; "a=Density specific for SO₂" should be deleted.
10. Equation 6.4.1(a), page 19; "a = % Dry basis moisture (free and combined) -1800" should read "a = % Dry basis moisture (free and combined) - 1800."
11. Equation 6.4.1(a), page 19; "a = Mole fraction of oxygen in air supply" is replaced by "a = Moles O₂ supplied per mole of stack gas."
12. Equation 6.4.1(h), page 20;

$$\frac{\text{"TSG} \times 386.2}{60}$$

should read

$$\frac{\text{"TSG' } \times 386.2}{60}$$

13. Equation 6.5.2(c), page 21; the heat of combustion for carbon monoxide should read " $= 121,716 \text{ Btu/mole.}$ "
14. Equation 6.5.2(d), page 22; all expressions for specific heat appearing as "Btu/mole" where the definition starts with $C_p\text{CO}_2$ should read "Btu/mole^{OF}."
15. Subsection 7.1.5, page 23; delete "and an hourly average over the entire test cycle at each heat output level."
16. Subsection 7.1.9(a), page 24, "Average flow rate cfm" is deleted.
17. Subsection 7.1.10(b), page 24, "Hydrocarbon: grams/kg, and grams/10⁶ joule (calculated)" is deleted.
18. Subsection 8.2.1, page 25; "certifiatio" is misspelled in the first sentence. The correct spelling is "certification."
19. Dichloromethane should be substituted for chloroform or diethyl ether for the Method 7 analysis.

Note for Clarification only: All catalytic combustor aging procedures must be conducted by a DEQ accredited test laboratory for stove certification purposes.

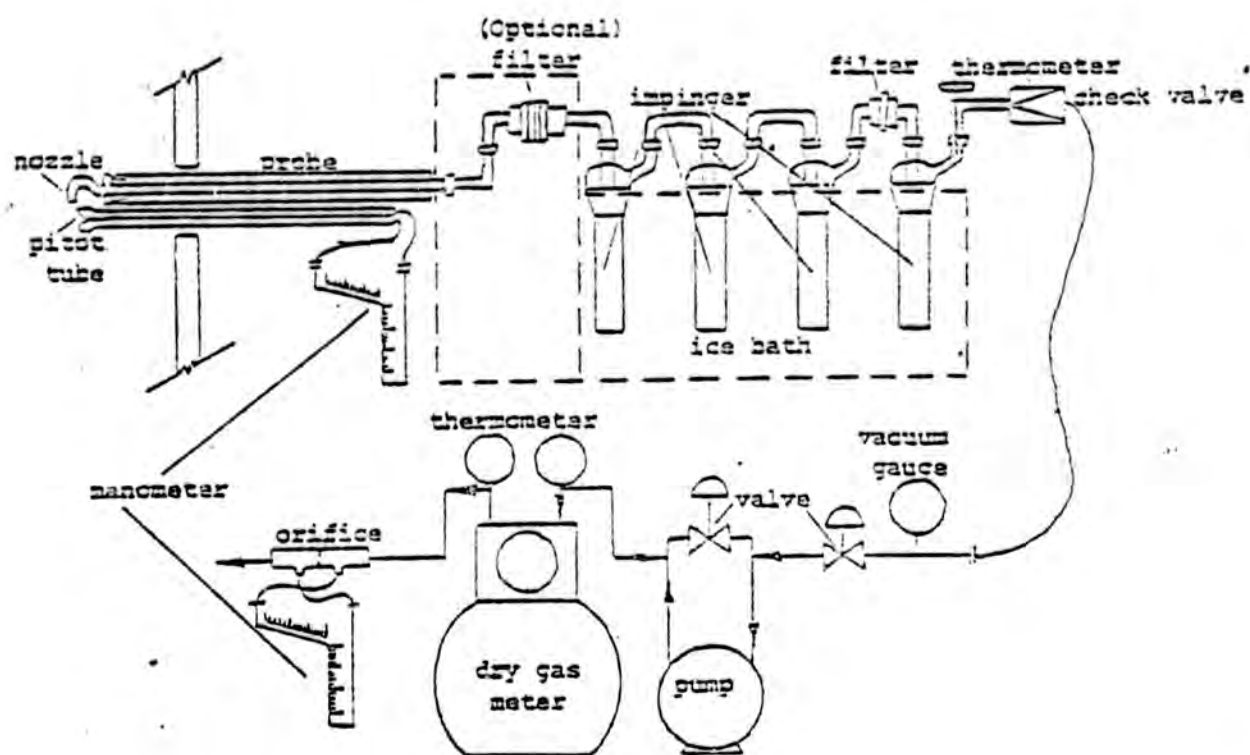


Figure 7-1

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Scheduled Maintenance

340-21-070 (1) In the case of shutdown of air pollution control equipment for necessary scheduled maintenance, the intent to shutdown such equipment shall be reported to the Department at least twenty-four (24) hours prior to the planned shutdown. Such prior notice shall include, but is not limited to the following:

(a) Identification of the specific facility to be taken out of service;

(b) The expected length of time that the air pollution control equipment will be put out of service;

(c) The nature and quantity of emissions of air contaminants likely to occur during the shutdown period;

(d) Measures, such as the use of offshift labor and equipment, that will be taken to minimize the length of the shutdown period, and where practical, minimize air contaminant emissions;

(e) The reasons that it would be impractical to shut down the source operation during the maintenance period.

(2) Additionally, in the case of maintenance scheduled more frequently than one time in a 90-day period, requiring shutdown of air pollution control equipment, or for any maintenance requiring shutdown of air pollution control equipment for a time period longer than 48 hours, prior approval of the maintenance program may be required by the Department. Application for approval shall be submitted in writing within 30 days after a request by the Department and shall include, in addition to subsections (a) through (e) in section (1) of this rule, specific information as to the frequency and the necessity of the scheduled maintenance. Approval of the program by the Department shall be based upon a determination that the proposed maintenance schedule is necessary and that all reasonable precautions have been taken to minimize the extent and frequency of air contaminant emissions in excess of applicable standards.

(3) No scheduled maintenance resulting in the emission of air contaminants in violation of applicable standards shall be performed during any period in which Air Pollution Alert, Air Pollution Warning, or Air Pollution Emergency has been declared.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 37, f. 2-15-72, ef. 3-1-72

Malfunction of Equipment

340-21-075 In the event that any emission source, air pollution control equipment or related facility malfunctions or breaks down in such a manner as to cause the emission of air contaminants in violation of applicable standards, the person responsible for such equipment shall:

(1) Notify the Department, by telephone or in person, of such failure or breakdown within one (1) hour of the occurrence, or as soon as is reasonably possible, giving all pertinent facts including the estimated duration of the breakdown.

(2) With all practicable speed, initiate and complete appropriate action to correct the conditions, and to reduce the frequency of such occurrences.

(3) Cease or discontinue operation of the equipment or facility no later than 48 hours after the beginning of the breakdown or upset period if the malfunction is not corrected within that time. The Director may, for good cause shown, which shall include but not be limited to, equipment

availability, difficulty of repair or installation, and nature and amount of the emission, authorize the extension of the operation period beyond 48 hours under this section for a reasonable period of time as determined by him to be necessary to correct the malfunction or breakdown.

(4) In the event an Air Pollution Alert, Air Pollution Warning, or Air Pollution Emergency is declared, or in the event the nature or magnitude of emissions from malfunctioning equipment is deemed by the Department to present an imminent and substantial endangerment to health, immediately proceed to cease or discontinue operation of the equipment or facility.

(5) Notify the Department when the condition causing the failure or breakdown has been corrected, and upon request, submit a written statement of the causes and the action taken to prevent future similar upset or breakdown conditions.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 37, f. 2-15-72, ef. 3-1-72

Woodstove Certification

Definitions

340-21-100 Unless otherwise required by context, as used in this Division:

(1) "Accredited" means a woodstove testing laboratory holds a valid certificate of accreditation issued by the Department.

(2) "Audit test" means a test conducted by the Department to verify a laboratory's certification test results.

(3) "Catalyst-equipped" means a woodstove with a catalytic combustor that is an integral component of the design and manufacture of a woodstove.

(4) "Certify" means the Department has acknowledged in writing that a woodstove meets Department emission standards when tested by an independent laboratory according to Department test procedures.

(5) "Consumer" means any person who buys a woodstove for personal use.

(6) "Dealer" means any person engaged in selling woodstoves to retailers or other dealers for resale. A dealer which is also an Oregon retailer shall be considered to be only a retailer for purposes of these rules.

(7) "Fixed air supply" means an air supply system on a woodstove which has no adjustable or controllable air inlets.

(8) "Heat output" means the heat output (Btu/hour) of a woodstove during one test run, measured under test conditions prescribed by OAR 340-21-120.

(9) "Informal Departmental conference" means a meeting of a manufacturer, dealer, retailer, or laboratory representative and a representative of the Department to discuss certification or accreditation denial or revocation, or civil penalties. An informal Departmental conference is not part of a judicial process or the formal hearing process as described in Oregon Administrative Rules Chapter 340, Division 11.

(10) "Manufacturer" means any person who constructs a woodstove or parts for woodstoves.

(11) "New Woodstove" means any woodstove that has not been sold, bargained, exchanged, given away or has not had its ownership transferred from the person who first acquired the woodstove from the manufacturer's dealer or

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agency, and has not been so used to have become what is commonly known as "second hand" within the ordinary meaning of that term.

(12) "Overall efficiency (%) over the range of heat outputs tested" means the weighted average combustion efficiency (%) multiplied by the weighted average heat transfer efficiency (%) measured under test conditions (range of heat outputs) and calculated according to specific procedures prescribed by OAR 340-21-115(5). This definition is applicable to the Stack Loss Methodology. For the Calorimeter Room Method, the weighted average overall efficiency means the useful heat output released to the room, divided by the total heat potential of the fuel consumed.

(13) "Retailer" means any person engaged in the sale of woodstoves directly to consumers.

(14) "Smoke emission rate (grams/hour) over the range of heat outputs tested" means the weighted average particulate emissions (grams/hour) that are produced by a woodstove under test conditions (range of heat outputs) specified in OAR 340-21-120 and calculated according to procedures specified in OAR 340-21-115(5).

(15) "Weighted average" means the weighted average of the test results to the distribution of home heating needs in Oregon. (Refer to OAR 340-21-115(5)).

(16) "Woodstove" means a wood fired appliance with a closed fire chamber which maintains an air-to-fuel ratio of less than 30 during the burning of 90 percent or more of the fuel mass consumed in the low firing cycle. The low firing cycle means less than or equal to 25 percent of the maximum burn rate achieved with doors closed or the minimum burn achievable, whichever is greater.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 11-1984, f. & ef. 6-26-84

Requirements for Sale of New Woodstoves in Oregon

340-21-105 (1) On and after July 1, 1986, a person shall not advertise to sell, offer to sell, or sell a new woodstove in Oregon unless:

(a) The woodstove has been tested to determine its emission performance and heating efficiency in accordance with criteria and procedures specified in OAR 340-21-120; and

(b) The woodstove is certified by the Department in accordance with procedures in OAR 340-21-125 as meeting the emission performance standards specified in OAR 340-21-115; and

(c) The woodstove is labelled for emission performance and heating efficiency as specified in OAR 340-21-135; provided, however, that section (1) of this rule shall not apply to any sale from any manufacturer or dealer to any Oregon manufacturer or dealer; or to any out-of-state manufacturer, dealer or retailer; or to any offer or advertisement for such sale directed only to such a manufacturer, dealer or out-of-state retailer.

(2) No manufacturer, dealer or retailer shall alter either the permanent or removable label in any way from the label approved by the Department pursuant to OAR 340-21-155.

(3) Violators of any of the above rules may be subject to civil penalties pursuant to OAR Chapter 340, Divisions 11 and 12 or other remedies prescribed by rule or statute.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 11-1984, f. & ef. 6-26-84

Exemptions

340-21-110 (1) Wood-fired appliances that are not suitable for heating equipment in or used in connection with residences or commercial installations are excluded from 340-21-105. For example, portable camping stoves.

(2) Wood-fired forced air furnaces that primarily heat living space or water through indirect heat transfer using forced air duct work or pressurized water systems are excluded from 340-21-105.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 11-1984, f. & ef. 6-26-84

Emissions Performance Standards and Certification

340-21-115 (1) New woodstoves with minimum "heat output" of less than 40,000 Btu/hr advertised for sale, offered for sale, or sold in Oregon within the period July 1, 1986 to June 30, 1988, shall not exceed the following weighted average particulate emission standards when tested to procedures in OAR 340-21-120:

(a) 15 grams per hour for a non-catalytic woodstove; or

(b) 6 grams per hour for a catalyst-equipped woodstove.

(2) New woodstoves with minimum "heat output" of less than 40,000 Btu per hour advertised for sale, offered for sale, or sold in Oregon on or after July 1, 1988 shall not exceed the following weighted average particulate emission standard when tested and measured according to test procedures in OAR 340-21-120:

(a) 9 grams per hour for a non-catalytic woodstove; or

(b) 4 grams per hour for a catalyst-equipped woodstove.

(3) New woodstoves with a minimum "heat output" of greater than 40,000 Btu per hour, advertised for sale, offered for sale, or sold in Oregon after July 1, 1986 shall not exceed an average particulate emission standard equal to the sum of 8.0 grams per hour plus 0.2 grams per hour for each thousand Btu per hour heat output when tested to procedures in OAR 340-21-120.

(4) The Department will certify a woodstove as meeting the applicable woodstove emission standard after July 1, 1984 in accordance with procedures in OAR 340-21-125.

(5) The weighted average particulate emission shall be calculated as set out in Exhibit 1.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 11-1984, f. & ef. 6-26-84

Testing Criteria and Procedures

340-21-120 (1) To be considered eligible for certification, a woodstove must be tested in strict conformance with criteria and procedures contained in the document **Standard Method for Measuring the Emissions and Efficiencies of Residential Woodstoves** dated June 8, 1984, and incorporated herein by reference and on file at the Department.

(2) A testing for certification purposes shall be conducted by a stove testing laboratory accredited by the Department in accordance with procedures specified in OAR 340-21-160.

(3) The Department may permit minor changes in the testing criteria and procedures which the Department believes does not affect its accuracy with respect to compliance with the emission standard providing such changes are approved in writing by the Department prior to the actual conducting of such tests.

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[Publications: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

General Certification Procedures

340-21-125 (1) Any woodstove manufacturer, or dealer, wishing to obtain certification of a woodstove shall file an application with the Department.

(2) An application for certification must include:

(a) An appliance description which includes the woodstove model name and design number, a copy of the appliance's operating manual and a photograph of the stove.

(b) Design plans of the woodstove, identified by design number, which include overall dimensions of the appliance and all dimensions and specifications of components critical to emission control and heating efficiency performance. These components shall include combustion chamber configurations, all air inlet controls, heat exchanger design and make and model numbers of applicable purchased parts.

(c) All test data and support documentation showing that the woodstove has been tested in accordance with OAR 340-21-120 and that it meets the emission performance standard specified in OAR 340-21-115.

(d) A non-refundable certification fee, payable to the Department at the time the application is submitted to the Department, is required for each stove model seeking certification. The fee is:

(A) \$1600 for a manufacturer's first model seeking certification; and

(B) \$ 800 for each additional model submitted by the manufacturer.

(3) The Department will promptly review an application for certification and:

(a) Notify the applicant in writing within 30 days of receipt of the application, of any deficiencies in the application that cause the application to be incomplete.

(b) Notify the applicant within 60 days of receipt of a completed application whether certification is granted or denied pursuant to sections (4) and (7) of this rule.

(4) When all the preceding requirements have been met, the Department will issue or deny a certification document to the manufacturer or dealer for the specified woodstove.

(5) If the Department grants certification, the certification status shall be effective for no longer than five years unless extended or terminated by rule or order.

(6) An application for a new document of certification shall be made by submitting a completed application including retests and fees at least 60 days prior to expiration of certification. The Department may waive the retest and fees if the applicant demonstrates the previous evidence used to certify the woodstove has not changed and remains reliable and applicable.

(7) If the Department denies certification of a woodstove, the Department will notify the manufacturer or dealer in writing of the opportunity for a hearing pursuant to OAR Chapter 340, Division 11.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Changes in Woodstove Design

340-21-130 Certification of woodstoves shall be valid for only the specific model, design, plans and specifications which were originally submitted, tested and approved for certification. Any modification to the model, design, plans or specifications shall cause the certification to be ineffective and any so modified woodstoves to be uncertified, unless prior to making such modification the certification holder submits the proposed modification to the Department for approval, and the Department approves it. The Department may approve the proposed modification if the holder demonstrates and the Department finds that the proposed modification would not affect emission performance or heating efficiency.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Labelling Requirements

340-21-135 Woodstoves which must be labelled pursuant to OAR 340-21-105 and shall have affixed to them:

(1) A permanent label, that has been previously approved by the Department in writing as to form, content and location, that shows the test emissions and heating efficiency for the range of heat outputs tested.

(2) A point-of-sale removable label that verifies certification and shows how the appliance's emission test results compare with the Oregon emission performance standard; and shows the heating efficiency and heat output range of the appliance. The label shall be affixed to the appliance at the point-of-sale near the front and top of the stove and remain affixed until sold and delivered to the consumer.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Permanent Label

340-21-140 All woodstoves certified by the Department from July 1, 1984 on, shall be labelled with a permanent and a removable label.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Contents of Permanent Label

340-21-145 (1) The permanent label, or "Certified Test Performance" label, shall contain the following information:

(a) Testing laboratory;

(b) Date tested;

(c) Test procedure used;

(d) Manufacturer of appliance;

(e) Model;

(f) Design number;

(g) The statement: "Performance may vary from test values depending on actual home operating conditions";

(h) A graph showing:

(A) Smoke emission rates, in grams/hour, over the range of heat outputs tested.

(B) Overall efficiency over the range of heat outputs tested.

(2) The axis of the graph shall be identified as follows:

(a) Vertical axis, left side: "Smoke - grams/hour", with a scale of 0 to a maximum of 20, bottom to top.

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(b) Vertical axis, right side: "Efficiency - %", with a scale of a minimum of 50 to a maximum of 90, bottom to top.

(c) Horizontal axis, bottom: "Heat Output - Btu/hour", with a scale from 0 to a maximum of 5,000 Btu/hour higher than the highest tested heat output.

(3) Curves describing emissions and efficiency at various heat outputs shall be printed on the graph, and will be developed by the Department as follows:

(a) The emissions curve will be developed by the Department by fitting the emission test data to the quadratic equation:

$$y = a_0 + a_1x + a_2x^2$$

where:

(A) y = particulate emissions (grams/hour).

(B) x = heat output (Btu/hour).

(C) a_0, a_1, a_2 = regression coefficients.

(b) The overall efficiency curve shall be developed by the Department by fitting the efficiency test data to the quadratic equation:

$$y = a_0 + a_1x + a_2x^2$$

where:

(A) y = overall efficiency (%).

(B) x = heat output (Btu/hour).

(C) a_0, a_1, a_2 = regression coefficients.

(4) For woodstoves with a fixed air supply which have only two data points for emissions and two data points for overall efficiency the Department will:

(a) Develop the emission performance description by averaging the two emission data points and describe the performance on the graph with a single point representing the average.

(b) Develop the overall efficiency performance description by averaging the two efficiency data points and describe the performance on the graph with a single point representing the average.

(5) The curves or single points will be developed and fit on the graph by the Department and transmitted to the appliance manufacturer for printing on the label. Changes from the above criteria may be made by the Department as necessary to insure readability. Approval of the label design, layout, and location on the woodstove will be made by the Department and shall be obtained pursuant to OAR 340-21-155.

(6) The label shall be permanently secured or fixed to the appliance so that it is visibly located on the appliance and legible, and meets the following criteria:

(a) A permanent label shall be a label that cannot be removed from the appliance without damage to the label. The label shall remain legible for the maximum expected useful life of the appliance in normal operation.

(b) A label shall be readily visible after installation. Approval of the location of the label on a woodstove will be made by the Department and shall be obtained pursuant to OAR 340-21-155. The label may be located on:

(A) Any visible exterior surface except the bottom of the appliance; or on

(B) Any interior surface of the appliance, within stove compartments, or under overlapping covers or doors, or at

another interior location, if the label can be seen after installation and will remain legible for the life of the stove.

(c) A legible label shall be quickly and easily read.

(d) It shall be acceptable to combine the permanent label with another label, such as a safety label, if the design and integrity of the permanent label is not compromised, and if the combination label meets the approval of the Department.

(7) Physical and Material Specifications:

(a) The minimum dimensions of the label shall be at least 3-1/2" long by 2" wide.

(b) The graph on the label shall be at least 3" long by 1-1/2" wide; and any enlargement of the graph shall maintain a proportion represented by the length to width ratio of 2:1.

(c) The label must be made of a material that will satisfy the permanency rule (340-21-145(6)(a)). For instance, it may be made of aluminum, brass, galvanized steel, or another metal, and of a thickness that will ensure permanence of the label.

(d) The information on the label shall be applied to the label in a way that will satisfy the permanency and legibility rules (340-21-145(6)(a) and (c)). For instance, the information may be etched, silk-screened, or die-stamped onto the label.

(e) The label shall be secured to the appliance in a way that it will satisfy the permanency and visibility rules (340-21-145(6)(a) and (b)). For instance, the label may be riveted, screwed, or bolted onto the appliance.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 11-1984, f. & ef. 6-26-84

Removable Label

340-21-150 (1) The point-of-sale removable label, or "Emissions and Efficiency Performance" label, shall contain the following information:

(a) "Smoke (Ave.) _____ grams/hour", weighted average of tested values.

(b) "Efficiency (Ave.) _____ %", weighted average of tested values.

(c) Summary of the applicable emissions standard.

(d) Heat output range, tested values.

(e) Manufacturer of appliance.

(f) Model of appliance.

(g) Design number of model.

(h) A statement verifying certification.

(i) The statement "Performance may vary from test values depending on actual home operating conditions".

(2) The label shall be visibly located on the appliance when the appliance is available for inspection by consumers.

(3) This label may not be combined with any other label or with other information.

(4) The label shall be attached to the appliance in such a way that it can be easily removed by the consumer upon purchase. For instance, the label may be attached by adhesive, wire, or string.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 11-1984, f. & ef. 6-26-84

Label Approval

340-21-155 (1) Permanent label:

(a) The Department will provide guidance on the design of labels by supplying information that shall be placed on the label at the time certification is granted.

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(b) The manufacturer or dealer shall submit to the Department:

(A) The name, phone number and address of the label manufacturer.

(B) A proof copy of the label, printed on a representative sample of the label stock, shall be submitted to the Department, if practical; if not, a sample of the label stock shall be submitted for review with a proof copy of the label. The copy shall be as representative of the intended final printed label as practical. The copy shall be actual size; and shall show the proposed label design; layout; artwork; print size, style and color; and shall show all the information required on the label, including curves or points.

(C) A drawing, diagram, or photograph that identifies the location of the permanent label on the woodstove.

(D) Information that describes or shows how the permanent label will be affixed to the woodstove. For instance, it may be a description of an adhesive type, adhesive manufacturer, and performance characteristics; or rivet type, rivet manufacturer, and performance characteristics.

(c) Within 14 days of receipt of all information required in subsection (b) of this section, the Department will approve or deny use of the proposed label.

(2) Removable label:

(a) The Department will provide the manufacturer or dealer, at the time of certification with:

(A) A copy of the standardized printed removable label, with all printing specifications; and

(B) The specific information that shall be printed in the spaces on the label by the manufacturer.

(b) The manufacturer or dealer shall submit to the Department for review:

(A) A proof copy of the proposed label with the required information printed on the labels.

(B) The method of attaching the removable label to the woodstove.

(C) The name, telephone number, and address of the label printer.

(c) Within 14 days of receipt of all the information required in subsection (b) of this section, the Department will approve or deny use of the proposed label.

(3) The manufacturer shall submit to the Department three final printed permanent, and three final printed removable labels within one month of receiving the labels from the printer.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Laboratory Accreditation Requirements

340-21-160 A laboratory submitting test data pursuant to requirements in this rule shall have a valid certificate of accreditation issued by the Department. A laboratory may initiate application for an accreditation certificate by submitting written documentation to the Department that accreditation criteria contained in OAR 340-21-165 are met. In addition, the laboratory must demonstrate stove testing proficiency pursuant to OAR 340-21-170, in order to qualify for accreditation.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Accreditation Criteria

340-21-165 (1) All laboratories shall meet the following

criteria and standards at the time of application and shall continue to meet these criteria as a condition of maintaining accreditation:

(a) The laboratory shall be an independent third-party testing organization with no organizational, managerial, or financial affiliation with any manufacturer, supplier or vendor of any woodstove covered under its testing programs. For example:

(A) The laboratory shall not be owned by any manufacturer or vendor, or own any manufacturer or vendor of woodstoves.

(B) The management of the laboratory shall not control or be controlled by any manufacturer or vendor.

(C) The laboratory shall not be engaged in the promotion or design of the woodstove being evaluated or tested.

(D) The laboratory shall have sufficient diversity of clients or activity so that the loss or award of a specific contract regarding testing would not be a determinative factor in the financial well being of the laboratory.

(E) The employment security status of the personnel of the laboratory shall be free of influence or control of any one or more manufacturers or vendors of woodstoves tested.

(b) The laboratory shall be operated in accordance with generally accepted professional and ethical business practices. For example:

(A) The laboratory shall accurately report values that reflect measured data.

(B) The laboratory shall limit certification program test work to that for which it can perform competently.

(C) The laboratory shall immediately respond and attempt to resolve every complaint contesting test results.

(c) The laboratory shall be staffed by personnel competent to perform the test procedures for which accreditation is sought. For example:

(A) The laboratory shall assure the competency of its staff through the observation or examination or both of each relevant staff member in the performance of tests, examinations, and inspections that each member is assigned to perform. The observations must be conducted at intervals not exceeding one year by one or more individuals judged qualified by the person who has technical responsibility for the operation.

(B) The laboratory shall make available the description of its training program for assuring that new or untrained staff will be able to perform tests and inspections properly and uniformly to the requisite degree of precision and accuracy.

(C) The laboratory shall maintain records, including dates of the observation or examination of performance of all personnel.

(d) The laboratory shall be equipped with the necessary instrumentation and equipment to test all appliances in accordance with the Department's test procedures.

(e) The laboratory must have in place and maintain a viable record keeping system. This means that records must be easily accessible, in some logical order and contain complete information on the subject. Records covering the following items are required and will be physically reviewed during the on-site assessment either in total or by selected sampling:

(A) Measuring equipment: each instrument name and description, name of manufacturer, model, style and serial number. Specifications on range or level of precision, date

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and documentation of calibration, record of maintenance and frequency of calibration.

(B) Data systems: samples of raw and reduced data sheets, test report format, method (manual or automated) of data recording, analysis and reporting.

(C) Staff training dates and results.

(D) Staff competency review dates and results.

(E) Equipment calibration (or verification) records shall include the following: equipment name or description; model, style, serial number; manufacturer; notation of all equipment variables requiring calibration or verification; the range of calibration/verification; the resolution of the instrument and allowable error tolerances; calibration/verification date and schedule; date and result of last calibration; identity of the laboratory individual or external service responsible for calibration; source of reference standard and traceability.

(F) Test data and reports, including emissions and efficiency calculations fully documented and all other items required by the specific test method.

(G) Sample tracking and logging records shall trace the movement of each stove through the laboratory from its receipt through all the tests performed to the final test report. Dates, condition of sample, and laboratory personnel involved should be included.

(I) The laboratory shall maintain a quality control system to help assure the accuracy and technical integrity of its work consisting of the following:

(A) The laboratory's quality control system must include a quality control manual containing written procedures and information in response to the applicable requirements of the test procedures. The procedures and information may be explicitly contained in the manual or may be referenced so that their location in the laboratory is clearly identified. The written procedures and information must be adequate to guide a testing technician and inspector in conducting the tests and inspections in accordance with the test methods and procedures required for the stove testing for which accreditation is sought.

(B) The laboratory shall have a current copy of its quality control manual or laboratory operations control manual available in the laboratory for use by laboratory personnel and shall make the manual available to the Department for review and audit.

(C) The quality control manual shall consist of general guidelines for the quality control of the laboratory's method of operation. Specific information shall be provided for portions of individual test methods whenever specifics are needed to comply with the criteria or otherwise support the laboratory's operations.

(g) The laboratory shall maintain an emissions and efficiency computer program that produces reasonably the same results to the Department's, using a standard data set provided by the Department.

(h) Neither the laboratory owners or business affiliates shall discriminate in management or business practices against any person or business because of race, creed, color, religion, sex, age, or national origin. In addition, neither the laboratory nor its owners or operators shall be certified by any association or are members of any association that discriminates by business or management practices against any person or business because of race, creed, color, religion, sex, age, or national origin.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 11-1984, E. & ef. 6-26-84

Application for Laboratory Accreditation

340-21-170 (1) A laboratory applying for accreditation shall state in writing and demonstrate by providing documentation, that they comply with the criteria and standards in OAR 340-21-165 at the time of application, and how they will continue to meet the criteria and standards on an ongoing basis.

(2) The laboratory shall notify the Department in writing within 30 calendar days should it become unable to conform to any of the criteria and standards in OAR 340-21-165.

(3) The laboratory shall demonstrate to the Department that the laboratory's emission and efficiency computer program produces reasonably the same results to the Department's, using a standard data set provided by the Department.

(4) Deficiency in the application will be identified by the Department in writing, and must be resolved by the laboratory before further processing occurs.

(5) The application will not be considered complete for further processing until the laboratory certifies in writing that the deficiencies have been resolved. The application will be considered withdrawn if the applicant fails to certify resolution within 90 days of postmark of notification by the Department.

(6) When the application is approvable, the Department will inform the laboratory in writing and schedule an on-site laboratory inspection.

Stat. Auth.: ORS Ch. 468

Hist.: DEQ 11-1984, E. & ef. 6-26-84

On-Site Laboratory Inspection and Stove Testing Proficiency Demonstration

340-21-175 (1) An on-site inspection will be conducted by a Department representative after all laboratory information required by OAR 340-21-165, has been provided by the laboratory, reviewed and approved by the Department. The on-site visit will be conducted when a laboratory initially applies for accreditation and when the laboratory reapplies for a new certificate of accreditation.

(2) During the on-site inspection, the Department representative will:

(a) Observe the Stove Testing Proficiency Demonstration specified in OAR 340-21-170(3).

(b) Meet with management and supervisory personnel responsible for the testing activities for which the laboratory is seeking accreditation.

(c) Review representative samples of laboratory records. To facilitate examination of personnel competency records, the laboratory should prepare a list of names of staff members who perform the tests.

(d) Observe test demonstrations and talk with laboratory personnel to assure their understanding of the test procedures. Refer to OAR 340-21-120 and 340-21-170(3).

(e) Physically examine selected equipment and apparatus.

(f) At the conclusion of the on-site visit, the Department will discuss observations with responsible members of the

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TABLE 2
(340-21-115)

CUMULATIVE PROBABILITY FOR A GIVEN HEAT OUTPUT
DEMAND BASED ON OREGON CLIMATE (POPULATION WEIGHTED^a)

<u>Heat Output</u> <u>(Btu/hr)</u>	<u>Cumulative</u> <u>Probability (P)</u>	<u>Heat Output</u> <u>(Btu/hr)</u>	<u>Cumulative</u> <u>Probability (P)</u>
0	0.02640	24,600	0.97873
600	0.03071	25,200	0.98256
1,200	0.03503	25,800	0.98540
1,800	0.04130	26,400	0.98713
2,400	0.04888	27,000	0.98972
3,000	0.05863	27,600	0.99096
3,600	0.06879	28,200	0.99237
4,200	0.08122	28,800	0.99316
4,800	0.09837	29,400	0.99408
5,400	0.11586	30,000	0.99472
6,000	0.13522	30,600	0.99506
6,600	0.15803	31,200	0.99526
7,200	0.18394	31,800	0.99563
7,800	0.21615	32,400	0.99589
8,400	0.24867	33,000	0.99679
9,000	0.28798	33,600	0.99711
9,600	0.32621	34,200	0.99745
10,200	0.37040	34,800	0.99774
10,800	0.41575	35,400	0.99787
11,400	0.46226	36,000	0.99817
12,000	0.50831	36,600	0.99837
12,600	0.55778	37,200	0.99851
13,200	0.60326	37,800	0.99858
13,800	0.64770	38,400	0.99882
14,400	0.68572	39,000	0.99899
15,000	0.72483	39,600	0.99915
15,600	0.75743	40,200	0.99933
16,200	0.78883	40,800	0.99945
16,800	0.81816	41,400	0.99958
17,400	0.84386	42,000	0.99968
18,000	0.86822	42,600	0.99974
18,600	0.88951	43,200	0.99986
19,200	0.90667	43,800	0.99992
19,800	0.92228	44,400	0.99995
20,400	0.93620	45,000	0.99996
21,000	0.94720	45,600	0.99999
21,600	0.95545	46,200	1.00000
22,200	0.96158	46,800	1.00000
22,800	0.96699	47,400	1.00000
23,400	0.97151	48,000	1.00000
24,000	0.97515	> 48,000	1.00000

^a Based on ambient temperature data during October through April, 1967-73 with population weighting from eight Oregon locations (Portland, Medford, Pendleton, Astoria, Burns, North Bend, Redmond, and Salem).

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laboratory management pointing out any deficiencies uncovered.

(3) In order to be accredited and as a part of each on-site laboratory inspection, each laboratory must demonstrate to the Department's representative its ability to successfully and proficiently conduct and report a woodstove emission and efficiency test. Each laboratory will:

(a) Be required to test one woodstove provided by the Department. Costs for all stove shipping, catalytic combustors, or other necessary parts will be paid by the laboratory.

(b) Be required to test the stove in accordance with testing criteria and procedures specified in OAR 340-21-120.

(c) Conduct the actual emission and efficiency testing in the presence of a Department observer.

(d) Submit all test data, observations and test results to the Department for technical evaluations.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Accreditation Application Deficiency, Notification and Resolution

340-21-180 (1) Any deficiencies noted during the on-site inspection and/or in the test data and test results submitted from the stove testing proficiency demonstration will be specifically identified in writing and mailed to the laboratory within 30 days of the on-site visit.

(2) The laboratory must respond in writing within 30 days of the date of postmark of the notification by the Department and provide documentation that the specified deficiencies have been corrected. All deficiencies must be corrected prior to accreditation being granted.

(3) Deficiencies noted for corrective action will be subject to thorough review and verification during subsequent on-site visits and technical evaluations.

(4) Any deficiencies in the test data and/or results may result in subsequent proficiency tests being required at the laboratory with a Department representative present.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Final Department Administrative Review and Certificate of Accreditation

340-21-185 (1) When all application material has been received, including the on-site inspection and the stove testing proficiency evaluation, and there has been time for all deficiencies to be resolved, the Department will grant or deny accreditation.

(2) Accreditation can be denied for failure to comply with or fulfill any of the criteria in OAR 340-21-165, -170, and -175.

(3) When accreditation is approved, a certificate of accreditation will be issued to the laboratory. Accreditation will be granted for a period of three years (36 months) subject to rule change or revocation for cause, pursuant to OAR 340, Division 11.

(4) A certificate of accreditation is not renewable. A holder may obtain a new certificate of accreditation by completing the application procedure in OAR Chapter 340-21-170, and demonstrating compliance with OAR 340-21-165 and 340-21-175.

(5) The Department may select and audit test one stove tested by the laboratory during its accredited status to verify certification test results. Any discrepancies noted will be communicated to the laboratory by certified or registered mail. The laboratory must respond in writing within 30 days of postmark of notification and provide documentation or certification by an authorized member of the laboratory management that the specified discrepancies have been corrected or the laboratory may be subject to civil penalties or revocation of accreditation.

(6) A laboratory may voluntarily terminate its accreditation by written request at any time. The certificate of accreditation must be returned with the request.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

Civil Penalties, Revocation, and Appeals

340-21-190 (1) Violation of any of these rules shall constitute cause to revoke the manufacturer or dealer's woodstove certification or laboratory's certificate of laboratory accreditation, and also may be subject to civil penalties and other remedies pursuant to rule or statute.

(2) Certification of a woodstove may be revoked if the woodstove was tested at a laboratory that was found to be in violation of accreditation criteria and rules at the time the woodstove was tested for certification.

(3) When certification or accreditation has been revoked, the holder shall return the certification or accreditation document to the Department and cease to use mention of Department certification or accreditation of the stove model or laboratory on any of its test reports, correspondence or advertising.

(4) Stove certification and lab accreditation revocation shall be handled as contested cases pursuant to OAR Chapter 340, Division 11.

Stat. Auth.: ORS Ch. 468
Hist.: DEQ 11-1984, f. & ef. 6-26-84

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EXHIBIT 1
(340-21-115)

Calculating Weighted Average
Particulate Emission

$$\bar{E} = \frac{K_1 E_1 + K_2 E_2 + K_3 E_3 \dots + K_n E_n}{K_1 + K_2 + K_3 \dots + K_n}$$

where: $\bar{E}$ is the weighted average particulate emission rate in grams per hour; $E_1, E_2, E_3 \dots E_n$ are the particulate emission rates in grams per hour from test runs 1 through n in order of increasing heat output; and $K_1, K_2, K_3 \dots K_n$ are the weighting factors for test runs 1 through n. The weighting factors (K_i) are calculated as follows:

$$K_i = P_{i+1} - P_{i-1}$$

where P_i is the cumulative probability from Table 2 for the heat output measured during each test run, $P_0 = 0$, and $P_{n+1} = 1$.

OREGON DEQ CERTIFIED WOODSTOVES AND THEIR MANUFACTURERS

<u>Manufacturers</u>	<u>Woodstoves</u>
Timber-Eze, Inc. Route 5, Box 22 Millersburg, OH 44654 Contact: Paul Weaver (216) 893-2971	Model: Timber-Eze 477 Design #: Ultra 1 Catalytic; Freestanding
Kent Heating, Ltd. 59 Tidal Road Mangere PO Box 23-340 Papatoetoe Auckland, New Zealand Contact: Betty Hume Klickitat Enterprises, Inc. 1801 NW Upshur Portland, OR 97209 (503) 295-0121	Model: Tile Fire Mark II LPE Design #: 566410 Noncatalytic; Freestanding
The Stack Manufacturing Company, Ltd. PO Box 9354 Newmarket Auckland, New Zealand Contact: Daniel Melcon 0400 SW Custer Way Portland, OR 97219 (503) 245-5546	Model: Vista Design #: #640 Noncatalytic; Freestanding
Osburn Industries 6691 Mirah Road, RR #3 Victoria, British Columbia Canada V8X 3X1 Contact: David Linkletter (604) 652-3963	Model: Regent 1000 Design #: 2 Noncatalytic; Freestanding
Arrow Tualatin, Inc. PO Box 1299 Tualatin, OR 97062 Contact: Dick Sparwasser (503) 692-1500	Model: ATS-II Design #: 5000 Catalytic; Freestanding
Earth Stove, Inc. Bldg C-7 9775 SW Commerce Circle Wilsonville, OR 97070 Contact: John McIntire (503) 682-3384	Model: 1000C Design #: E.S. 01 Catalytic, Freestanding

OREGON DEQ CERTIFIED WOODSTOVES AND THEIR MANUFACTURERS

Manufacturers	Woodstoves
Woodcutters Manufacturing, Inc. 3301 East Isaacs Walla Walla, WA 99362 Contact: Larry Canaday (509) 529-9820	Model: Blazeking 'King' Design #: KEJ-1101 Catalytic; Freestanding
Lopi International Ltd. 10850 117th Place, NE Kirkland, WA 98033 Contact: Allan Atemboski (206) 827-9505	Model: Answer Design #: A-1, A-2, A-3 Noncatalytic; Freestanding and Insert
Brugger Industries, Ltd. Private Bag Wainuiomata Wellington, New Zealand Contact: Neil Martin 8651 West Park Street Boise, ID 83704 (208) 322-0479	Model: BOSCA Design #: FS 500, TM 500 Noncatalytic; Freestanding
Martenson Industries, Inc. 24430 S. Highway 99-E Canby, OR 97013 Contact: Don Martenson (503) 266-2026	Model: Rawhide I Design #: RH861 Noncatalytic; Freestanding
Collins Bio-Energy Company 4804 SW 112th Street Tacoma, WA 98499 Contact: Bruce Collins (206) 582-0470 (206) 582-4327	Model: Pellefier Design #: FS 1 Noncatalytic; Freestanding; Continuous feed pellet burner
CESCO Industries, Inc. PO Box 9948 Greensboro, NC 27480 Contact: Patricia Bickley CESCO Industries, Inc. PO Box 7817 Roanoke, VA 24019 (703) 366-7118	Model: Fisher Design #: Tech IV Catalytic, Insert

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revised October 16, 1985

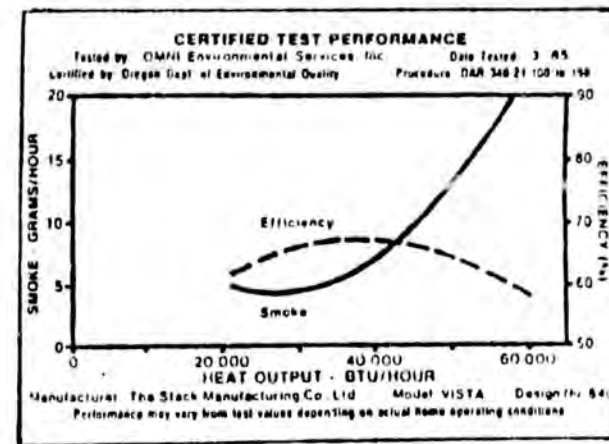
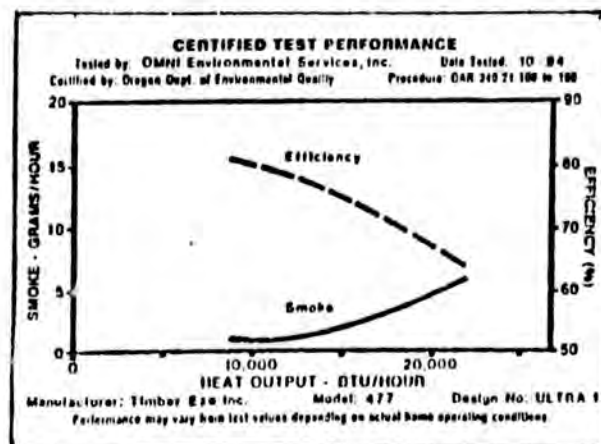
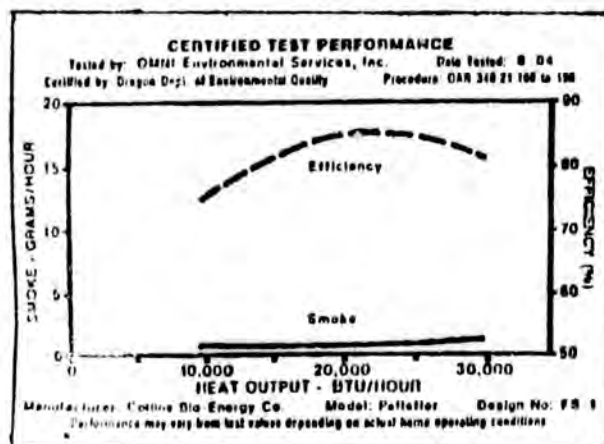
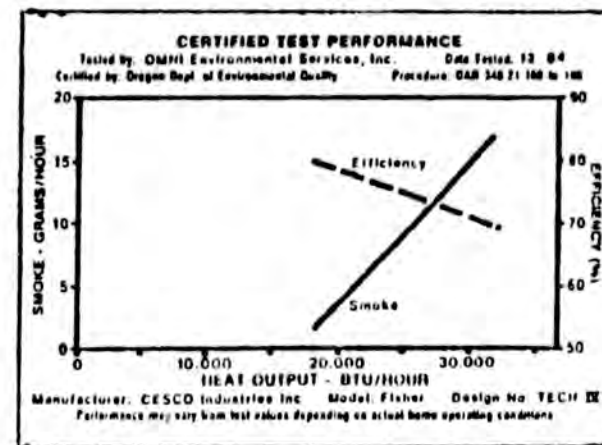
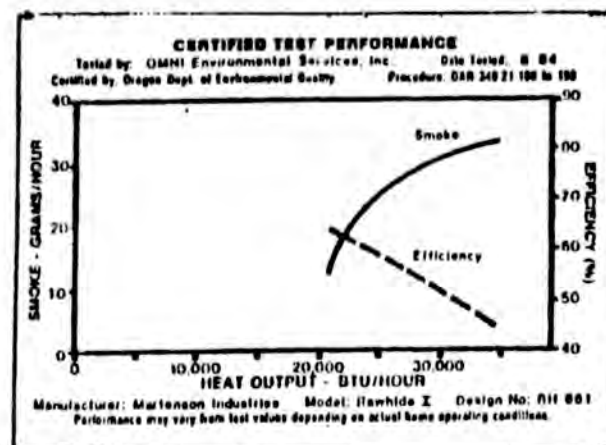
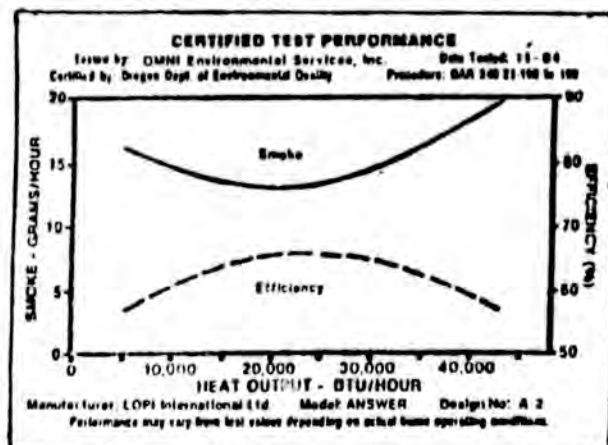
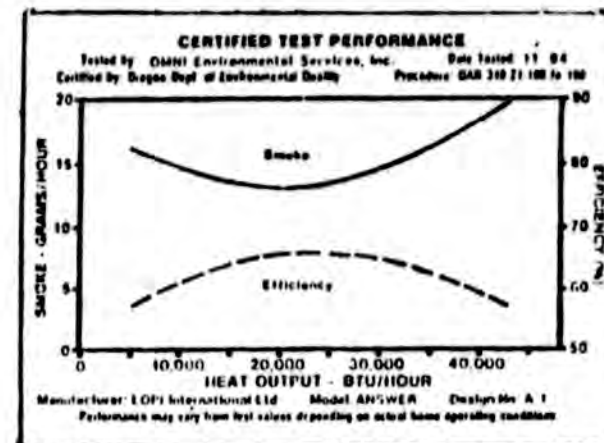
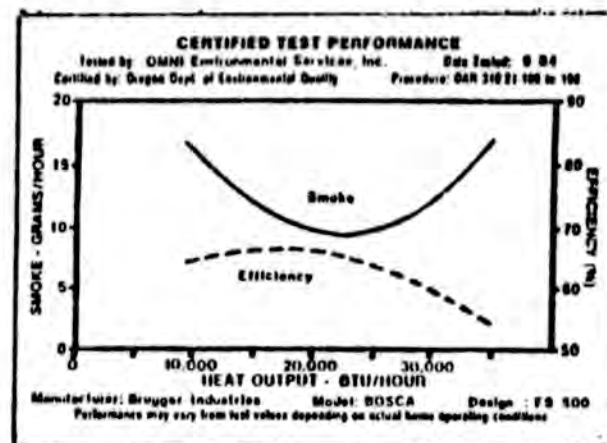
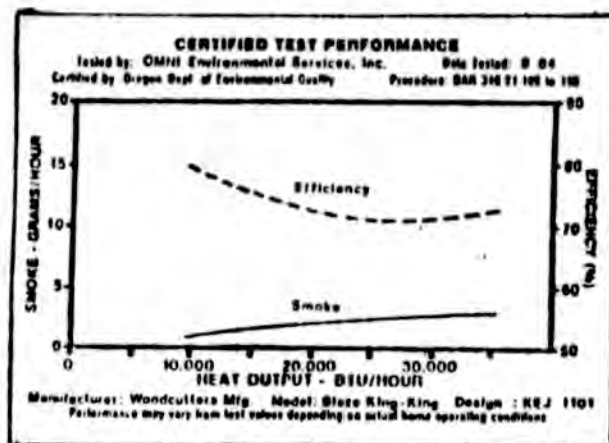
MEETS 1988 STANDARD

Oregon Smoke Standard: After June 30, 1986: 15 grams/hr non-catalytic, 6 grams/hr catalytic
(Particulate Emissions) After June 30, 1988: 9 grams/hr non-catalytic, 4 grams/hr catalytic

Model, Design Number Manufacturer	Type ⁽¹⁾	Date Certified	Average ⁽²⁾ Smoke (grams/hr)	Average ⁽²⁾ Overall Efficiency (%)	Heat Output ⁽³⁾ Range (Btu/hr)	Burn Time Between Refueling ⁽⁴⁾ (hours) Low High	Average ⁽³⁾ Weight of Test Fuel [lbs]	Average ⁽⁵⁾ Draft (inches H ₂ O)
Large King 'King,' FJ-1101 Woodcutters Mfg.	C, FS, SL	12-21-84	1.6	76.9	9,510 to 35,200	16.2 4.4	29.2	.021 to .052
OSCA FS 500 Rugger Industries Ltd.	NC, FS, SL	12-21-84	13.5	64.8	9,832 to 35,307	3.8 1.0	9.1	.032 to .070
NSHER A1 opi International, Ltd.	NC, FS, WO, SL	01-22-85	14.8	62.1	4,887 to 43,350	6.3 0.75	8.3	.023 to .070
NSHER A2 opi International, Ltd.	NC, H, WO, SL	01-22-85	14.8	62.1	4,887 to 43,350	6.3 0.75	8.3	.023 to .070
Whide I RH861 Martenson Industries	NC, FS, W, SL	01-30-85	13.8	59.8	20,707 to 34,512	2.4 1.1	11.9	.051 to .069
Isher TECH IV ESCO Industries	I, C, SL	03-01-85	2.5	79.1	18,033 to 31,794	5.6 2.8	17.2	.050 to .061
ellefier FS-1 Collins Bio-Energy Co.	FS, NC, PF,	03-01-85	0.7	79.4	9,455 to 29,630	N/A N/A	N/A	.009 to .015
Imber Eze 477 Imber Eze, Inc.	C, FS, SL	03-01-85	2.0	75.8	8,660 to 21,860	11.4 3.4	17.5	.027 to .050
Ista 640 The Stack Mfg. Co., Ltd.	NC, FS, SL	03-14-85	5.4	61.8	20,839 to 60,104	1.8 0.6	8.6	.064 to .093

- 1) C=Catalytic, NC=Noncatalytic, W=Tested with optional blower, WO=Tested without optional blower, SL=Safety Listed, FS=Free Standing, I=Insert, (All inserts are tested with a direct flue connection and full length insulated chimney.), H=Hearth, PF=Pellet Fuel
- 2) Average performance based on average Oregon heating load (approximately 13,000 Btu/hr)
- 3) Based on consumption of a test charge of Douglas fir at 16 - 20 percent moisture and loading density of 7 lbs wood/cubic foot of firebox volume. Stoves tested at heat output less than 10,000 Btu/hr may be capable of operating at lower than stated values. Minimum stated heat output over 10,000 Btu/hour represent the minimum heat output achievable during certification testing. Heat output may vary depending on type and quantity of fuel used.
- 4) Time between refueling during certification test at low and highest heat output (refueling occurs when an entire test charge of fuel has been consumed, with a hot coal bed remaining).
- 5) Measured within 1 foot of stove's flue connection. Values shown are averaged over an entire test cycle; both low and high heat output tests are displayed.

For more information write: Oregon Department of Environmental Quality, PO Box 1760, Portland, Oregon 97207,
or call (503) 229-6488; in Oregon, toll-free 1-800-452-4011



OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY CERTIFIED WOODSTOVES
revised October 16, 1985

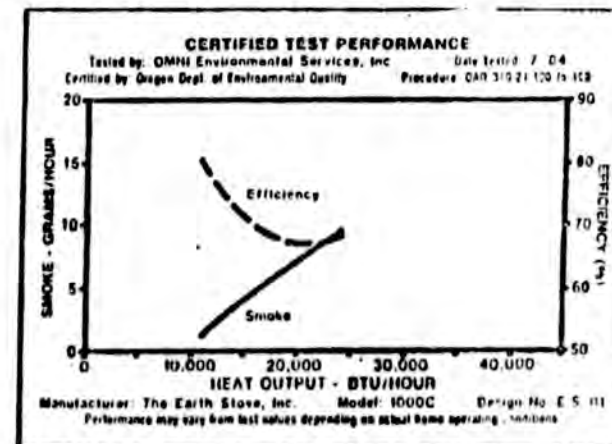
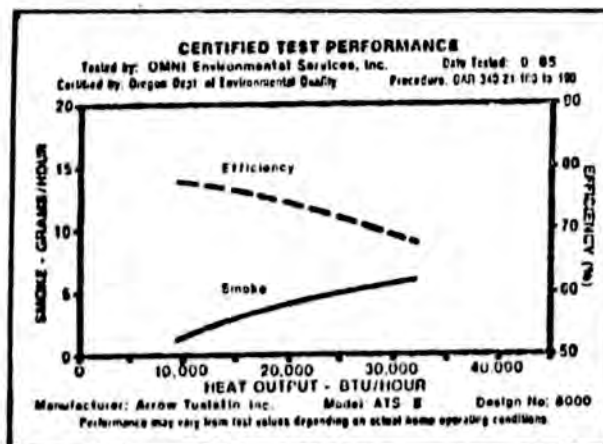
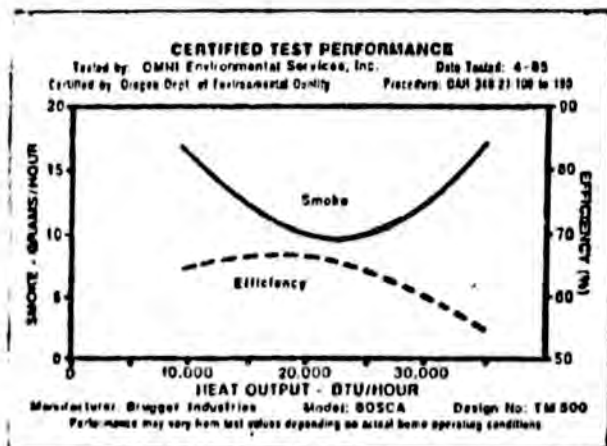
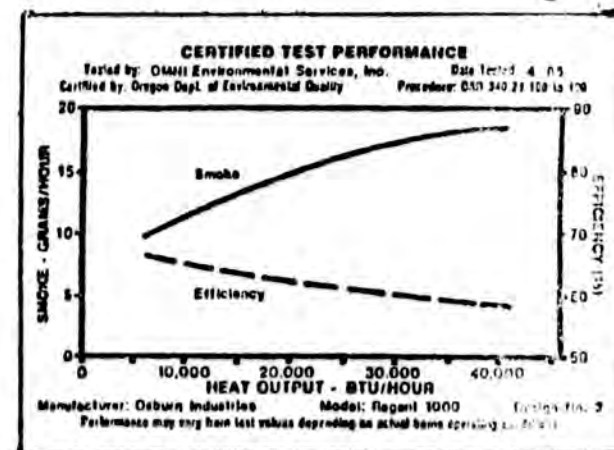
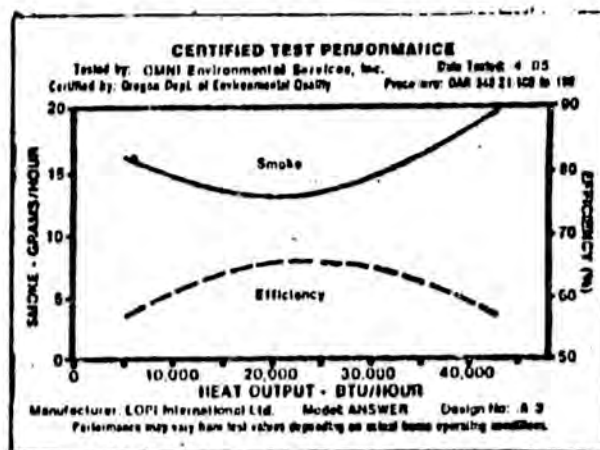
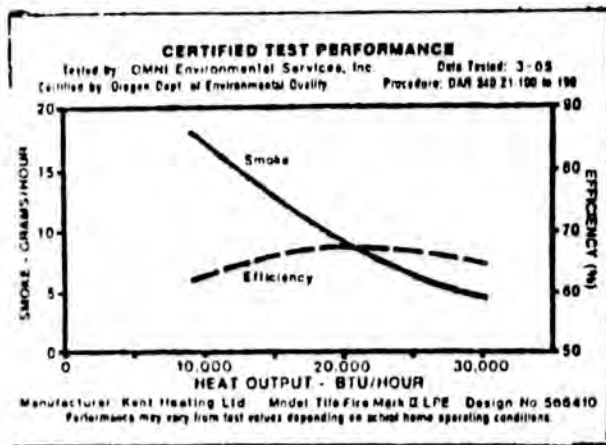
MEETS 1988 STANDARD

Oregon Smoke Standard: After June 30, 1986: 15 grams/hr non-catalytic, 6 grams/hr catalytic
(Particulate Emissions) After June 30, 1988: 9 grams/hr non-catalytic, 4 grams/hr catalytic

Model, Design Number Manufacturer	Type ⁽¹⁾	Date Certified	Average ⁽²⁾ Smoke (grams/hr)	Average ⁽²⁾ Overall Efficiency (%)	Heat Output ⁽³⁾ Range (Btu/hr)	Burn Time Between Refueling ⁽⁴⁾ (hours) Low High	Average ⁽³⁾ Weight of Test Fuel (lbs)	Average ⁽⁵⁾ Draft (inches H ₂ O)
Tile Fire Mark II LIFE 566410 Kent Heating, Ltd.	NC, FS SL	03-14-85	14.2	64.5	8,966 to 30,062	5.0 1.6	10.2	.035 to .076
ANSWER A3 Lopi International, Ltd.	NC, I, WO, SL	04-09-85	14.8	62.1	4,887 to 43,350	6.3 0.75	8.3	.023 to .070
Regent 1000 2 Osborn Industries	NC, FS, SL	06-26-85	12.5	65.2	6,259 to 40,991	6.5 1.0	9.3	.028 to .076
BOYCA TM 500 Brugger Industries Ltd.	NC, I, SL	07-23-85	13.5	64.8	9,832 to 35,307	3.8 1.0	9.1	.032 to .070
ATS-II 5000 Arrow Tualatin, Inc.	C, FS, SL	09-13-85	2.5	75.6	9,055 to 31,838	6.5 1.8	11.0	.031 to .051
1000C E.S. 01 The Earth Stove, Inc.	C, FS, SL	10-16-85	3.5	74.9	10,873 to 24,418	7.3 3.0	15.1	.028 to .053

- (1) C=Catalytic, NC=Noncatalytic, W=Tested with optional blower, WO=Tested without optional blower, SL=Safety Listed, FS=Free Standing, I=Insert, (All inserts are tested with a direct flue connection and full length insulated chimney.), H=Hearth, PF=Pellet Fuel
- (2) Average performance based on average Oregon heating load (approximately 13,000 Btu/hr)
- (3) Based on consumption of a test charge of Douglas fir at 16 - 20 percent moisture and loading density of 7 lbs wood/cubic foot of firebox volume. Stoves tested at heat output less than 10,000 Btu/hr may be capable of operating at lower than stated values
Minimum stated heat output over 10,000 Btu/hour represent the minimum heat output achievable during certification testing.
Heat output may vary depending on type and quantity of fuel used.
- (4) Time between refueling during certification test at low and highest heat output (refueling occurs when an entire test charge of fuel has been consumed, with a hot coal bed remaining).
- (5) Measured within 1 foot of stove's flue connection. Values shown are averaged over an entire test cycle; both low and high heat output tests are displayed.

For more information write: Oregon Department of Environmental Quality, PO Box 1760, Portland, Oregon 97207,
or call (503) 229-6488; in Oregon, toll-free 1-800-452-4011



CITY AND BOROUGH OF JUNEAU, ALASKA
 CERTIFIED WOODSTOVES WHICH WOULD MEET THE
 PROPOSED WOODSMOKE REGULATIONS
 Revised January 17, 1986

Model	Type	Average Smoke (grams/hr.)	Average Overall Efficiency	Output Heat (BTU/hr.)	Burn Time Between Refueling (hours)	
					Low - High	
Blaze King "King"	Catalytic	1.6	76.9	9,510 to 35,200	16.2	4.4
Fisher Tech IV	Fireplace Insert (Catalytic)	2.5	79.1	18,033 to 31,794	5.6	2.8
Timber Eze 477	Catalytic	2.0	75.8	8,660 to 21,860	11.4	3.4
Vista 640	Non-Catalytic	5.4	61.8	20,839 to 60,104	1.8	0.6
Earth Stove 1000-C	Catalytic	3.5	74.9	10,873 to 24,418	7.3	3.0
Arrow ATS II	Catalytic	2.5	75.6	9,055 to 31,838	6.5	1.8
Turbo 10	Catalytic	3.1	76.0	12,662 to 35,427	6.5	2.2
*Pellefier FS-1	Non-Catalytic	0.7	79.4	9,455 to 29,630	NA	NA
*Whitfield	Non-Catalytic	0.9	79.4	9,499 to 26,638	NA	NA
*Collins Hopper	Add-on Device	2.6	73.4	6,932 to 56,196	NA	NA
Earthstove 1002-0 (This model with the air supply stop is the only model that has been approved)	Non-Catalytic	5.6	68.7			
Sweethome Stove Works Catalytic Fir AK-18	Catalytic	2.0	76.2			
ORLEY'S Leopard U246 Free Standing Model	Catalytic	2.5	73.0			
ORLEY'S Panther F246 Hearth Model	Catalytic	2.5	73.0			
**Jotul 3C	Catalytic	3.9	73.0			
**Jotul 8C	Catalytic	6.0	75.0			

*Burns Pellet Fuel

**Only certified for the rear vent application



RECORDS CERTIFICATION



I, the undersigned, an employee of the State of Alaska, do hereby certify that the microfilm images on this microform are accurate reproductions of the original records of the State of Alaska as accumulated during the regular course of business, and that it is the established policy and practice of this State to microfilm its records and to dispose of the original records after microfilm reproductions have been made.

James O. Smith
Signature of Camera Operator

12/15/89
Date

SCOMM

#50:33

Introduced: 3/15/85
Referred: Community & Regional
Affairs, Judiciary and Finance

FILES: BONDS
CC: NORDALE -
BOERHO -
BARKER -
BOUAIN -
WONLFOETH -

BY THE RULES COMMITTEE BY
REQUEST OF THE GOVERNOR

1 IN THE HOUSE

2

HOUSE BILL NO. 293

3

IN THE LEGISLATURE OF THE STATE OF ALASKA

4

FOURTEENTH LEGISLATURE - FIRST SESSION

5

A BILL

6

For an Act entitled: "An Act relating to municipal default on bonded indebtedness; establishing the Municipal Financial Emergency Commission; and providing for an effective date."

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10 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

11 * Section 1. LEGISLATIVE FINDINGS. The legislature finds that

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(1) while the power of municipalities to contract debt for capital improvements is granted by the Alaska Constitution, revenues that may be raised to repay the debt are limited by the extent to which the state has delegated taxing authority to the municipalities under art. X, sec. 2 of the Alaska Constitution;

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(2) the state has a strong interest in debt issuance by municipalities because of the impact on state revenue as a result of municipal assessment to repay debt and because of the effect on the marketability of bonds issued by the state and its agencies, by public corporations of the state, by other municipalities, and by the Alaska Municipal Bond Bank Authority;

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(3) bonds issued by municipalities are not legal obligations of the state, nor are the bonds supported by the moral obligation of the state; and

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(4) it is in the public interest, and is declared to be a public purpose, to promote the prosperity and general welfare of all the people of the state by assisting in the development and implementation of refinancing plans for municipalities that have defaulted on outstanding debt.

1 * Sec. 2. AS 29.58 is amended by adding new sections to read:

2 ARTICLE 7. DEFAULT ON BONDED INDEBTEDNESS.

3 Sec. 29.58.400. MUNICIPAL FINANCIAL EMERGENCY COMMISSION. (a)

4 The Municipal Financial Emergency Commission is established in the
5 Department of Community and Regional Affairs.

6 (b) The members of the commission consist of the commissioner of
7 the Department of Community and Regional Affairs, the commissioner of
8 the Department of Revenue, and the commissioner of the Department of
9 Administration. Members of the commission may appoint a designee to
10 serve on the commission.

11 (c) The commissioner of the Department of Community and Regional
12 Affairs shall chair the commission. A quorum of the commission con-
13 sists of two members.

14 (d) The commission may employ staff as is necessary to accom-
15 plish the purposes of the commission.

16 Sec. 29.58.410. DUTIES AND POWERS OF THE COMMISSION. (a) Upon
17 receipt of a written notice of a default by a municipality, as provid-
18 ed in AS 29.58.420, the Municipal Financial Emergency Commission may

19 (1) investigate the defaulting municipality's fiscal af-
20 fairs, consult with the assembly or council of the defaulting munici-
21 pality, and negotiate with creditors in order to assist the municipal-
22 ity in developing a plan for satisfaction of the outstanding debt;

23 (2) direct a state agency holding money on behalf of or
24 payable to the defaulting municipality to pay the money either to the
25 commission for payment to creditors, or to the defaulting municipality
26 for disposition as required under an adopted plan;

27 (3) determine whether a proposed plan is fair and equitable
28 and within the ability of the defaulting municipality to meet, and, if
29 so, enter an order finding that it is fair, equitable, and within the

1 ability of the municipality to meet;

2 (4) advise the defaulting municipality to take the neces-
3 sary steps to implement the plan;

4 (5) order the defaulting municipality to take the necessary
5 steps to implement the plan if the municipality fails to implement the
6 plan within 30 days after receiving the advice of the commission to
7 implement the plan;

8 (6) require periodic reports on the defaulting municipali-
9 ty's financial affairs during the period in which the plan is imple-
10 mented;

11 (7) approve or reject the defaulting municipality's annual
12 budget ordinance during the period in which the plan is implemented;

13 (8) approve or reject the issuance of additional bonds,
14 notes, or other debt, whether short- or long-term, during the period
15 in which the plan is implemented;

16 (9) impound the books and records of a defaulting munici-
17 pality and assume full control of its financial affairs, including the
18 levying of taxes, expenditure of money, and adoption of budgets, if
19 the municipality fails to implement a plan, or if, in the opinion of
20 the commission, the defaulting municipality will default on a future
21 debt service payment under the plan if the financial policies and
22 practices of the municipality are not improved; and

23 (10) order a defaulting municipality to pay for the cost of
24 developing and implementing a plan.

25 (b) The power and authority granted to the commission continues,
26 with respect to a defaulting municipality, until the commission is
27 satisfied that the defaulting municipality has performed or will
28 perform the duties required of it in the plan, and until agreements
29 made with the defaulting municipality's creditors have been performed

1 in accordance with the plan.

2 (c) The commission is authorized to take all actions necessary
3 to accomplish the purposes of AS 29.58.400 -- 29.58.490, including,
4 but not restricted to, the authority to issue subpoenas necessary for
5 the production of documents and the authority to issue orders. A
6 superior court may, upon application of the commission, compel obedi-
7 ence with a subpoena or order issued by the commission.

8 Sec. 29.58.420. NOTICE OF DEFAULT. (a) A municipality shall
9 give notice of default to the commissioner of community and regional
10 affairs within 10 calendar days after actual knowledge of the default.

11 (b) A creditor may give notice to the commissioner of community
12 and regional affairs any time after a default by a municipality.

13 (c) A municipality may request the assistance of the commission
14 at any time before default if, in the judgment of the municipality,
15 assistance from the commission will assist the municipality in reliev-
16 ing financial distress.

17 Sec. 29.58.430. ACTION UPON RECEIVING NOTICE OF DEFAULT. The
18 commissioner of community and regional affairs shall convene a meeting
19 of the commission within 15 days after the receipt of a notice of de-
20 fault, or of a request for assistance, under AS 29.58.420. The de-
21 faulting municipality must be given notice of the meeting, and shall
22 send an authorized representative to the meeting to represent the
23 defaulting municipality during the development of a plan under AS 29.-
24 58.410.

25 Sec. 29.58.440. STAY OF COURT PROCEEDING. (a) A proceeding
26 initiated in court by a creditor must be stayed until 90 days after
27 the first meeting of the commission following the receipt of the no-
28 tice of default by the commissioner of community and regional affairs.

29 (b) The court may grant one or more 30-day extensions of the

1 stay, at the request of the commission, unless the court finds that
2 the defaulting municipality or the commission has not made a good
3 faith effort to negotiate a plan under AS 29.58.410.

4 Sec. 29.58.450. BANKRUPTCY PETITION. AS 29.58.400 -- 29.58.490
5 do not limit or otherwise affect the authority of a municipality to
6 file a petition in bankruptcy under 11 U.S.C. secs. 901 -- 946.

7 Sec. 29.58.460. PENALTY. A municipal official, employee, or
8 agent who knowingly violates a provision of a plan developed under
9 AS 29.58.410 is guilty of a class C felony.

10 Sec. 29.58.490. DEFINITIONS. In AS 29.58.400 -- 29.58.490,

11 (1) "commission" means the Municipal Financial Emergency
12 Commission;

13 (2) "creditor" means a person having standing to bring an
14 action for default on outstanding debt against the defaulting munici-
15 pality;

16 (3) "default" means the failure by a municipality to pay an
17 installment of principal or interest on its outstanding debt, on or
18 before the due date;

19 (4) "defaulting municipality" means a municipality that has
20 defaulted, or which continues to be subject to the jurisdiction of the
21 commission after the implementation of a plan under AS 29.58.410;

22 (5) "outstanding debt" means revenue anticipation notes,
23 bond anticipation notes, general obligation bonds, revenue bonds, or
24 refunding bonds issued under this chapter.

25 * Sec. 3. This Act takes effect immediately in accordance with AS 01.-
26 10.070(c).

Cape May County, New Jersey

\$19 million general improvement bonds due 1987-1996
Competitive, March 5
Rated 'A-'

Rationale: S&P affirms Cape May County, N.J.'s 'A-' rating on outstanding general obligation general improvement bonds and assigns an 'A-' rating to the current \$19 million offering. The rating reflects strong financial performance and rapid bond retirement, coupled with the tourist-based economy and below-average wealth and income levels. Because of the developments in the casino industry in nearby Atlantic City, building permit activity is very strong. The casino industry also benefits from the county's commercial fishing industry because of increased tourism and year-round populations.

Economy: Cape May County forms the southernmost tip of New Jersey. The county is a peninsula, 454 square miles in total area, and has had steady population growth since the 1960s. The county's major industry is tourism, with the summer tourist industry the strongest economic factor for over 50 years. Population in the summer months increases to 593,856 from 95,724. Unemployment rates are seasonal in nature; during the summer of 1985, unemployment dropped to a low of 6% and reached 15% during the winter. Recent developments in the casino industry in nearby Atlantic City have significantly impacted the county's economy. Building permit activity has been very strong over the past few years with the construction of new hotels and motels, townhouses, and condominiums. The commercial fishing industry continues to be influenced favorably by Atlantic City as the larger tourist and permanent populations create greater seafood consumption.

Debt: Proceeds from this issue will be used for various municipal buildings, road, bridge, and storm sewer construction. With this issue, the county will have outstanding net debt of \$29.8 million. Per capita debt is high at \$1,007, but low as a percent of true value at 3.9%. Bond retirement is rapid, retiring 87% of the debt in 10 years. The S&P index, measure of per capita debt to per capita effective buying income, is moderate at 9.1%. The county's capital improvement program for the next five years amounts to approximately \$16.2 million, with 68% expected to be funded from bond proceeds.

Finances: Financial operations are sound. Revenues are derived primarily from property taxes, which account for approximately 70% of current fund revenues. The largest expenditures item is health and welfare, accounting for 24% of operating expenses. Debt service expense will increase with this sale to approximately 10% of budget. Unaudited results for year ended Dec. 31, 1985 show an ending fund balance net of deferred charges of \$6.1 million, or 14% of current fund revenues, a slight decrease from year-end 1984's \$6.4 million fund balance. The budget outlook for fiscal 1986 is expected to continue on a favorable basis, with revenues projected to be in line with budget expectations.

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Alaska

Reviewed: rating affirmed

Rationale: S&P affirms Alaska's 'AA-' rating on all outstanding general obligation bonds. With the continued "softening" of the world oil market, a new approach to revenue forecasting known as the "30th percentile" has been implemented. The 30th percentile method means that, in the estimation of the state financial forecasters, there is a 70% chance that revenues will actually be greater than the amounts forecasted, and only a 30% chance that they will be less. Current projections reflect an average annual decline in petroleum revenues of approximately 10% for 1986-1988. Indications are that at current levels the projected decline will not adversely affect state revenues in the short run. However, in the long run, an absence of sustained exploratory activity, smaller discoveries, enhanced recovery, and production of heavy oil, at least at current levels, can adversely affect state revenues. Financially, the state continues to perform in a manner commensurate with its rating, as evidenced by a good cash and fund balance position, and a strong permanent fund. The fishing and timber industries, important contributors to the Alaskan economy, are still somewhat depressed, but continue to show signs of gains. Debt remains manageable and is declining as the state continues to meet some of its capital needs through pay-as-you-go financing. Overall, the state's economy continued to show growth in population, employment and personal income, and maturation in the trade and services sectors.

Economy: The state's economic base is primarily extractive, with major dependence upon oil and gas production, and to a somewhat lesser extent, the supportive industries of fishing, timber, minerals, and tourism. Approximately 86% of state revenues are derived from royalties and taxes paid on state-owned oil and gas leases. Indications are that the production level of several Cook Inlet fields is declining and production from the

Prudhoe Bay field will substantially decline in the 1990s. As of Jan. 1, 1986, the Alaska Oil and Gas Conservation Commission estimated the state's remaining recoverable reserves to be 7.995 billion barrels of oil and 34.23 trillion cubic feet of gas. Approximately one-third of Prudhoe Bay's estimated 9.6 billion barrels had been produced by year-end 1984. Some encouragement may be gained from the fact that there have been varied successes in oil and gas exploration in North Slope, totaling an estimated 2.5 billion barrels of recoverable oil. This new exploration bolstered a relatively strong employment picture. Arco Alaska and Standard Oil Co. of Ohio, two major petroleum operators, are cutting their construction budgets by 43% and 17%, respectively. The combined exploration spending still represents a large sum for 1986 at \$1.25 billion. State revenue forecasters believe that in the short run, the current decline in world oil prices will be offset at the wellhead by the reduction in the Trans Alaska Pipeline System tariffs, by approximately \$1.20 per barrel. A partial settlement was reached in a long outstanding tariff litigation between the state and pipeline owners. The state will receive a total of \$235 million, including refunds from 1982-1985, as a result of this settlement. However, the settlement will have an adverse effect on local communities who depend on the pipeline for a portion of their property taxes. North Slope Borough will lose approximately \$2.0 million annually, while Valdez and Fairbanks North Star will lose approximately \$1.8 million and \$500,000 annually, respectively. In fiscal 1986, the state will receive an added \$227 million from this settlement.

The fishing and timber industries continue to be important contributors to the state's economy. Total revenues to fishermen from fish catch sold in Alaska for fiscal 1985 was \$700 million, compared to \$602.3 million in 1984. Since 1977, salmon catches have been improving, however, the shell fish industry, which includes king crab and shrimp, the major revenue contrib-

(continued on next page)

utors, remains somewhat depressed. However, it is anticipated that harvests will continue to improve, and the future of the industry enhanced by the priority given to U.S. fisheries over foreign fleets to harvest within the 200-mile fisheries conservation zone. Alaska forests are expected to remain a major source of timber, despite restrictions imposed by the Alaska National Interest Lands Conservation Act of 1979. As part of the settlement act passed by Congress, the industry has been guaranteed 450 million board feet per year, a quantity capable of sustaining traditional harvest levels. The industry has been declining since 1960, as export of forest products have declined at an average annual rate of 10% due to competition and a strong U.S. dollar. In 1984, forest product exports totaled \$219 million, or 21% of all Alaska exports.

Anticipated depletion of oil reserves in the future resulted in attention to minerals and mineral deposits. Shipments of coal to Korea from the Usibelli Mine, which began in 1984 and now totals 560,000 tons yearly, may be increased to 800,000 tons in 1985. Development of a world-class molybdenum mine by U.S. Borax & Chemical Co. is continuing with expectations of 900 new jobs on completion. Also under development are the Red Dog and Greens Creek zinc and lead mines. The Red Dog deposit is estimated at 29% of U.S. deposits and is the second largest zinc deposit in the world. Tourism continues to contribute significantly to the economy. Its importance is underlined by the size of the marketing budget of \$8.1 million in 1985, and a projected \$7.2 million in 1986. In 1984, 700,000 visitors spent a total of \$620 million. Approximately 715,000 visited in 1985.

Following completion of Trans Alaska Pipeline System construction in mid-1977, population which totaled 411,000 in 1976, declined to 402,000 in 1980. Since this decline, major gains have been realized, particularly in the early 1980s resulting in an approximate total increase of 25% for 1980-1984. Current estimated 1985 population is 566,600. For 1980-1984, all sectors of employment continued to experience growth with the exception of mining and manufacturing which had 11% and 1% declines, respectively. Government employment, historically high in Alaska, accounts for 29% of total employment for 1980-1984. Per capita money income experienced modest gains, with the 1981 level at \$11,722. This represents 134.8% of the U.S. average; at \$12,900 in 1983, it was the equivalent of 135.8% of the U.S. average. Total personal income for 1980-1984 increased from \$5,238 million to \$8,739 million, or 66.8%.

Finances: The state continues to portray a strong financial posture. Fiscal 1985 unrestricted revenues for the general fund totaled approximately \$3.2 billion, excluding amounts which go directly to the permanent fund. Petroleum revenues accounted for approximately 65% of total unrestricted revenues, down from a peak of 90% in 1980. Projected unrestricted general fund revenue for fiscal 1986 is \$3.1 billion, of which \$2.1 billion, or 68%, will be from petroleum revenues. As of Dec. 31, 1985 the permanent fund balance was \$7.0 billion. The fund is expected to total \$8.5 billion by 1990 and \$16.6 billion by 2000. The amount of fund income available for dividends in 1985 was \$217.3 million, with 521,323 eligible applicants receiving \$404.

An amendment to limit state appropriations to \$2.5 billion, approved by voters at the November 1982 general elections, will be placed on the ballot for reconsideration in the 1986 general election. Under the amendment, state appropriations cannot exceed \$2.5 billion for any fiscal year by more than the cumulative change, based on federal indices in population and inflation after July 1, 1981. If rejected, it will be repealed. If approved, the amendment would become permanent, and appropriations may be subjected to impoundment powers of the governor, who may withhold or reduce appropriations during a budget year if revenues are less than appropriations. The amendment has not been operative, and has exceeded any revenues or accrued surpluses available for appropriation.

Debt: Historically, the issuance of state debt has been significant due to the state's commitment to capital improvement programs. The state is currently studying the implementation of a debt management policy, which may have been influenced by declining oil revenues and the need to meet unfilled infrastructure requirements while maintaining a conservative debt position. The policy will include all debt that relies on state general fund appropriations, in particular all nonself-supporting state debt, including G.O. debt, lease revenue debt, and similar obligations paid by the state. The state's last debt issuance was in fiscal 1983. Maximum annual debt service on all bonds is \$175.7 million, due in 1986. As currently structured, debt service requirements will decrease substantially through 2000.

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Alaska Municipal Bond Bank

Reviewed; ratings affirmed

Rationale: S&P affirms the 'A' rating on all outstanding Alaska Municipal Bond Bank's general obligation bonds and the 'A-' rating on all outstanding bond bank revenue bonds. About \$168.5 million of debt is affected. The basis of the rating is the moral obligation of the state. S&P policy establishes this rating at one full category below the existing rating of the state. In this case, the rating would be 'A-' based upon the state's 'AA-' rating. However, the G.O.s of the bond bank where the state has the authority to withhold aid to participating units, in lieu of debt service payments upon the request of the bank, are rated 'A'. The revenue bonds remain at 'A-', where no withholding provisions exist.

The bank: The Municipal Bond Bank Act established the bank as a public corporation and instrumentality of the state of Alaska within the department of revenue, but separate from and independent of the state. The bank, which began operations in August 1975, was created for the purpose of lending money to government units within the state of Alaska by purchasing municipal bonds issued by such governmental units. Under the act and the bank's general resolution, the bank initially was authorized to purchase only G.O. bonds. Effective May 16, 1978, the Alaska state legislature authorized the bank to purchase municipal

revenue bonds, and provided that the bank shall be called the Alaska Municipal Bond Bank Authority when issuing revenue bonds, and the Alaska Municipal Bond Bank when issuing G.O. bonds. The purchase of bonds is dependent upon bond counsel's opinion, stating that the bonds are valid obligations of the governmental unit as required by the act and that a loan agreement has been authorized and executed between the bank and the governmental unit, which constitutes a valid and binding obligation of the governmental unit. The powers of the bank are vested in a five-member board of directors, three of whom are public members appointed by the governor and confirmed by the state legislature. The three appointees serve four-year staggered terms. The remaining two members, the Commissioner of Revenue and the Commissioner of Community and Regional Affairs, are permanent.

Finances: Ongoing operations of the bank are not funded by the state's general fund appropriations, but by fees and charges and interest earned on investments. The bank is not allowed to carry surpluses, which must be returned to the state. Since its inception, the bank has returned \$7.6 million. In fiscal 1985, \$1.8 million was returned. The reserve fund, which receives capital appropriations from the state's general fund for

funds leveraging, is maintained at an amount equal to the maximum annual debt service requirement. As of June 30, 1985, the Alaska legislature has appropriated \$17.9 million to the bank for the statutory reserve fund, of which approximately \$5.4 million is available to meet statutory reserve fund requirements for future bank bond issues. The bank is annually required to deliver a statement to the governor and state legislature, stating the sum, if any, necessary to restore the reserve fund to the required debt service reserve level. The state is not legally obligated to make such an appropriation and, to date, it has never been necessary.

Debt: The bank has issued \$192.8 million in bonds with \$166.5 million currently outstanding. The outstanding debt is comprised of G.O., revenue, coastal energy reserve, and coastal energy loan program bonds. There is a statutory debt limit of \$300 million, of which \$131.5 million remains available. During 1982-1985, the bank's debt issuance has been \$48.5 million, \$30.6 million, \$7.0 million, and \$25.8 million, respectively. Due to declining state petroleum revenues, it is anticipated that local units will be turning to the bank on a regular basis for the financing of their capital needs.

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North Slope Borough, Alaska

Reviewed; ratings affirmed

Rationale: S&P affirms North Slope Borough, Alaska's outstanding 'BBB+' rating on approximately \$794.9 million general obligation bonds. The rating on \$52.8 million series D bond anticipation notes due Nov. 18, 1988 is also affirmed at 'SP-1+'. An additional \$428.5 million of G.O. debt is outstanding but secured separately by various credit enhancements. The long-term debt rating reflects the narrowness of the borough's economic base, the large amount of debt supported by that base, debt carrying charges that represent 67% of general fund expenditures, balanced by good financial operations and a strong financial position. The borough's economic viability entirely depends on the oil and gas industry, and the outlook for any significant diversification is poor. Due to remoteness and harsh environmental conditions, development of the limited infrastructure that supports the small community required the issuance of large amounts of debt. Total G.O. debt currently outstanding is approximately \$1.3 billion. The pace of debt issuance slowed over the past two years and is not expected to exceed \$107.4 million over the next three years. As a result, maturing debt should exceed new debt issuance over the period. The debt matures rapidly, with 48% rolling off in five years, and 95% in 10 years. The borough derives 60% of its revenues from a tax on oil- and gas-related real property improvements. Therefore, its main revenue stream is unaffected by fluctuations in oil prices. A small effect is expected from the recently settled pipeline tariff agreements which includes owners' income in the property assessment formula. The borough could lose up to \$2 million annually as a result of the settlement (0.6% of total revenues). An additional 27% of revenues is derived from interest earnings. The very large debt burden appears adequately supported by an increasing but very narrow tax base.

Issues: North Slope Borough is a vast, geographically isolated, sparsely populated area located entirely north of the Arctic Circle. Barrow, located almost 2,000 miles northwest of Seattle, is the borough seat and its largest city (population of 2,647). The virtually impassable Brooks Range forms the borough's southern boundary. A wide range of services is provided by the borough, including health, safety, sanitation, utilities, education, housing, and transportation systems. The borough is analogous to the county form of government in the lower 48 states, but has greater governmental powers. Remoteness, the absence of a modern infrastructure, and severe climatic conditions make the cost of development enormous.

Debt: Debt issuance increased sharply in 1983 and 1984 as infrastructure improvements were made to provide services to residents and to accommodate increased oil-related economic activity. The borough currently has outstanding \$1.3 billion G.O. bonds and bond anticipation notes (net of refunded debt). Debt on a per capita basis is extremely high at \$121,704, but is a more moderate 7.5% of true value (\$13 billion in 1986). Carrying charges are very high as a percent of expenditures. The primary source of payment for the debt is a property tax assessed

on capital improvements made at the oil and gas fields at Prudhoe Bay and Kuparuk. These properties represent 95% of the tax base. Capital financing of \$107.4 million is planned for the next three years. These funds will be raised principally through issuance of G.O. bonds. An emergency debt service reserve fund was established during fiscal 1984 and is funded at 15% of outstanding debt. At July 1, 1985, a balance of \$184 million was available in this fund. Debt service requirements for 1985 totaled \$189 million.

Economy: Oil and gas production, transportation, and exploration form the base of the borough's economy. Before the discovery of oil and gas at Prudhoe Bay in 1968, and the construction of the Alyeska Pipeline, economic activity was limited to subsistence hunting, fishing, and military activities (DEW LINE maintenance and research). Further diversification of the economy is not expected due to extreme geographic and climatic problems. The lack of a highway system within the borough makes commercial air service and limited water transportation the only available means of mass transportation.

Within the next 25 years, no basic industry is projected to supplement the oil and gas industry. Maintenance or expansion of the oil industry depends on competitive lease offerings by the state and federal governments. The lead time from lease to production is approximately 10 years. The present production level at Prudhoe Bay of 1.5 million barrels of oil per day represents roughly 18% of total U.S. domestic production. Proven, extractable reserves at Prudhoe Bay are currently projected to last 11 years. Production at Kuparuk has begun and is expected to be 250,000 barrels of oil per day during 1985. An industry investment in Kuparuk is expected to total \$8 billion and the economic life of the field is projected at 20-30 years. The two major North Slope operating companies are Atlantic Richfield Co. (Arco) and Standard Oil Co. of Ohio (Sohio). Although Arco's 1986 North Slope construction budget was reduced from \$715 million to approximately \$500 million as a result of reduced oil prices, work on the Prudhoe Bay Gas Plant and the Kuparuk Lisburne production facility will continue. Sohio has indicated it will proceed with its 1986 construction program as planned.

Finances: General fund financial operations remain strong. Significant operating surpluses were generated in each of the past five years which were transferred to the reserve for capital outlay fund, the emergency debt service reserve fund, or the recently created permanent fund. At July 1, 1985, balances available in these funds were \$72 million, \$184 million, and \$117 million, respectively. As a result of these transfers, the general fund balance was reduced from \$56 million in 1983 to \$4 million in 1985. The three primary revenue sources of the general fund are property taxes (60%), interest earnings (27%), and state aid (10%). Tax collections are excellent, reaching roughly 99% on a current basis in each of the last five years. Debt service of \$189 million represented 67% of general fund expenditures in 1985. As of July 1, 1985, a balance of \$184 million was available in

(continued on next page)

the emergency debt service reserve fund. Money in excess of the 15% requirement in this fund will be transferred to the permanent fund. As of June 1985, \$4 million was transferred from the emergency debt service reserve fund to the permanent fund. An additional \$79 million transfer from the general fund left a balance of \$117.4 million available in the permanent fund to be held in perpetuity. Interest earnings on permanent fund bal-

ances will be used for general fund operations. Although financial management is sound, large debt service carrying charges, the range of services provided, and the high cost of service provision will continue to absorb the borough's large financial resources.

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MUNICIPAL REVENUE

Alaska Industrial Development Authority

\$11 million variable demand/fixed rate bond due 2004
Sold, February 25, Goldman, Sachs & Co.
Rated 'A—'

Rationale: S&P assigns an 'A—' rating to the Alaska Industrial Development Authority's conversion of its variable demand/fixed rate bonds, series 1984 A and B to a fixed rate. The 'A—' rating on the outstanding economic development bonds, the consolidated bonds, and the umbrella bonds is affirmed. The rating is based upon the moral obligation pledge of the state of Alaska, whose rating is affirmed at 'AA—'. The bonds are additionally secured by the general obligation of the authority.

Issuer and security: The state legislature established the Alaska Industrial Development Authority in 1967 to aid in economic development. The authority was originally created to administer the enterprise development fund. This fund was capitalized in 1981 with \$166 million in state-originated loans. In addition, the state contributed \$23 million to fund the capital reserve funds. In 1982 and 1984, the enabling act was amended to expand the authority's powers. In 1982, the multifamily housing loan security fund was set up and in 1984 the economic development fund. All three programs are legally separate and distinct. All economic development activities are channeled through the enterprise development fund. This fund holds the authority's general assets from which all of the authority's general obligation indebtedness is payable. The enterprise development fund as of Dec. 31, 1985 had general assets of \$525 million. The multifamily housing fund, which is not an asset of the authority, provides additional security to any of the authority's G.O. bonds issued for multifamily housing projects. This fund at Dec. 31, 1985 held \$8 million in assets. The economic development fund empowers the authority to own and operate certain types of facilities when it is in the public interest to do so. This fund was capitalized with an appropriation of \$12 million in cash and \$132 million in loans held by the state. Financial obligations or liability incurred will be secured solely by the economic development fund and there is no general obligation pledge of the authority.

The authority has four types of bond issues outstanding: economic development bonds, consolidated bonds, umbrella bonds, and variable demand/fixed rate bonds. All issues except the variable demand/fixed rate bonds are secured by a general obligation pledge from the authority. Variable demand bonds are special obligations of the authority which become G.O.s upon conversion to a fixed rate. All bonds are further secured by the state's moral obligation pledge. If necessary, the state's legislature can, but is not obligated to, appropriate funds to the bonds through their capital reserve funds pursuant to notice under state statutes, if these reserves fall below required levels. The authority's total outstanding G.O. debt at June 30, 1985 is \$213 million. This issue will increase debt by \$11 million to \$224 million. Total variable rate/fixed rate debt at Dec. 31, 1985 excluding this conversion is \$40 million. The total \$40 million is expected to be converted to fixed rate by the end of 1986 for \$254 million in G.O. debt of the authority.

The economic development bonds provide funds for participations in loans for industrial and commercial projects up to \$1 million. All revenues from these loan participations are pledged first to the payment of economic development bonds and then

to the other G.O. debt of the authority. As of June 30, 1985, the total outstanding economic development bond debt was \$126 million. Consolidated bonds provide funds for participations in loans for industrial, commercial, and multifamily housing projects from \$1-\$10 million. Revenues from these participations are not specifically pledged to the repayment of consolidated bonds. However, this is not a credit concern because both economic development and consolidated bonds are secured by the authority's general obligation and the state's moral obligation pledges. As of Dec. 31, 1985, outstanding consolidated bonds totaled \$59 million.

The new umbrella bond program is intended to replace both the economic development and consolidated bonds. These new bonds do not have claim to the economic development, consolidated, and variable rate bonds' existing capital reserve funds. A separate reserve fund for the umbrella bonds was established with similar provisions to the previously issued bonds. At Dec. 31, 1985, the balances in all the capital reserve funds for the authority's G.O. debt is \$26 million. This balance reflects the average annual debt service payments of the bonds.

Loan portfolio: The authority's portfolio of loans falls into three categories: bond loans, appropriation loans, and federal guaranteed loans. Bond loans derive their funds from bond proceeds, appropriated loans from state appropriated money, and federal guaranteed loans from the authority's funds on hand. These three sources of funds are used to buy loan participations from Alaska financial institutions. The fiscal 1985 composition of the portfolio is 22% appropriated loans, 61% bond loans, and 17% Small Business Administration (SBA) guaranteed loans. Appropriated loans are expected to decline to an insignificant percentage of the portfolio by 1991. Funds from the paid-off appropriation loans are used to buy SBA loans or investments. However, no SBA loans have been purchased in the last year due to remittance procedure problems with the new SBA servicer FIDATA. Until this situation is eliminated, no future investments in the SBA program will be maintained. The authority's purchase of loan participations is limited to completed projects that satisfy all terms of the authority's loan underwriting criteria. The authority's capital participation rate in loans under \$1 million is 90% and 80% for those between \$1-\$10 million. Loans are disbursed geographically in proportion to the state's population distribution. As a result, the Anchorage area has the highest percentage of bonded loans at 55.5%. The portfolio's investment in projects is concentrated mainly in commercial space, approximately 78% in fiscal 1985. Bond loans delinquency rates on 90 days and over are still below 1%, even given the slump in the Alaska economy. This low rate is attributed to stringent underwriting criteria. In addition, each participating financial institution must provide servicing on all loans and maintain a 90-day delinquency rate below 2% or be suspended from selling new participations until the rate is controlled. The authority has a loan loss reserve fund of \$2.6 million. This was created in 1991 and to date, the only charge offs are \$1.1 million in defaulted appropriated loans. The reserve is

returned to its original level from earnings. The authority reviews the adequacy of this reserve fund annually with its accountants.

Finances: The authority's assets have grown from \$218 million in 1981 to \$524 million in 1985. Liabilities total \$220 million in fiscal 1985, of which \$213 million are bonds payable. All operating expenses are paid from commitment and finance fees. In fiscal 1985, this totaled \$1.4 million to cover expenses of \$1.1 million. Net earnings have risen from \$16 million in fiscal 1981 to \$30 million in fiscal 1985. The authority has unrestricted investments, capital reserve funds, cash, and interest earnings totaling \$157 million at June 30, 1985 to meet shortfalls in debt ser-

vice of approximately \$28 million. Unrestricted surplus at June 30, 1985 is \$284 million.

During fiscal 1986, the authority will convert all of its remaining \$40 million variable rate debt to fixed. In addition, during 1986's first half it intends to issue its first taxable financing of \$15 million. For fiscal 1987 and beyond, approximately \$65 million in debt will be issued a year. It is impossible to determine how H.R. 3638 will affect future issuances other than to assume the program will continue with additional volume constraints.

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Alaska Housing Finance Corp.

Reviewed: ratings affirmed

Rationale: S&P affirms Alaska Housing Finance Corp. (AHFC) ratings on \$4.27 billion in outstanding taxable and tax-exempt debt. The bonds, issued under 59 resolutions, are secured by over 52,000 level-paying mortgage and growing equity mortgage (GEM) loans. The loans are originated throughout the state by private lenders and subsequently purchased by the AHFC with bond proceeds. Direct state appropriations (in cash and in mortgages) permit the purchase of mortgage loans which bear interest at legislatively prescribed "below market" rates. To enhance the security of its bonds, the AHFC has entered into various credit arrangements. They include: Federal Housing Administration (FHA) Title I insurance, Federal National Mortgage Association (FNMA) and Government National Mortgage Association (GNMA) collateralization, bank letters of credit, and surety bonds. Additionally, the issuer enjoys strong support from the state of Alaska: 13 issues are guaranteed by a pledge of the state's full faith and credit. The affirmed bond ratings reflect the strength of the credit enhancements (see list at right).

Issuer: To date, AHFC has received \$563 million in state appropriations. Fiscal year ending June 1985 witnessed no requests for additional funding. Such funding will not be sought in the foreseeable future. Fund balances of \$1,458 million (fiscal 1985) reflect the healthy, well managed performance of the issuer to date. The corporation has a staff of 43 with experience in administration, mortgage underwriting, and finance. AHFC is governed by a five-member board consisting of two ex-officio and three governor-appointed members.

Programs: Since its inception in 1971, AHFC has adopted many innovative programs and financing techniques. The principal activities include:

—**Mortgage loan subsidization.** All of the corporation's programs provide an interest rate subsidy on the first \$90,000 of a mortgage loan to Alaskan borrowers. The state currently subsidizes the mortgage loans to a maximum of 3% (4% for eligible veterans) below the cost of taxable funds to the corporation. However, loan rates may not be less than 10% (9% for veterans) unless the corporation's related cost of funds is less than 10%.

—**Taxable bonds.** To overcome the constraints of tax-exempt issuance caps (\$200 million per annum), the corporation began issuing taxable bonds in 1981. It currently has approximately \$1.3 billion in taxable debt outstanding, \$100 million of which was issued in 1985.

—**Alaska Building Equity loan program.** In 1983, AHFC introduced its own version of the GEM loan. Titled the Alaska Building Equity (ABE) loan, it requires an increase in the borrower's monthly payments to provide for an accelerated amortization of principal. Thus, it can take advantage of shorter-term, lower interest taxable bonds.

—**FNMA collateralization.** In 1983, AHFC signed a \$530 million pool purchase contract with FNMA enabling Alaskan mortgages to be swapped for FNMA mortgage-backed securities.

Rated debt outstanding	Ami (mil. \$)	Rating
Housing mortgage bonds (nonparity)		
1972 series A.....	10.6	AA
1973 series A.....	10.3	AA
1973 series B.....	29.6	AA
1975 series A.....	30.6	AA
1976 series B.....	10.5	AA
Insured mortgage bonds (parity)	911.7	A
1975 first series; 1976 first and second series; 1977 first, second, and third series; 1978 first, second, and third series; 1979 first and second series; 1980 first, second, and third series;		
State-assisted mortgage bonds (nonparity)		
series A.....	95.8	A
series B and C.....	75.7	AA
series D and E.....	90.5	A-
series F.....	170.8	AA
series H.....	50.0	AA
series I.....	50.0	AA
series J.....	50.0	AA
series K.....	75.0	AA
series L.....	75.0	AA
series M.....	75.0	AA
series N.....	75.0	AA
series O*.....	50.0	AAA
series P*.....	50.0	AAA
Home mortgage bonds (nonparity)		
1981 first series.....	79.6	A-
1981 second series.....	80.9	A
1982 first series.....	77.6	AA-
1982 second series.....	93.3	AA-
1983 first series.....	73.1	AA-
1983 second series.....	122.4	AA-
Collateralized 1984 series A.....	75.0	AAA
Collateralized 1984 series B.....	127.4	AAA
Collateralized 1985 series A.....	100.0	AAA
Collateralized 1985 series B.....	102.4	AAA
State-guaranteed bonds (nonparity)*		
1983 first series.....	48.2	AA
1983 second series.....	117.5	AA
1983 third series.....	72.0	AA
1983 fourth series.....	94.7	AA
1983 fifth series.....	48.3	AA
1983 sixth series.....	72.7	AA
1984 first series.....	130.0	AA
1984 second series.....	100.0	AA
Collateralized 1984 first series.....	100.0	AAA
Collateralized 1984 second series.....	302.5	AAA
Collateralized 1985 first series.....	150.0	AAA
Second mortgage bonds.....	9.3	AA
Fairbanks North Star Borough res. mfg. bonds.....	28.1	A-
AHFC Overseas Finance N.Y. gtd. bonds.....	98.1	AAA

*Guaranteed by full faith and credit of the state of Alaska.

(continued on next page)

(MBSs). These MBSs are then, in effect, purchased with bond proceeds and used as collateral for the bonds. Such collateralization has enabled the issuer to obtain 'AAA' ratings on 10 tax-exempt and taxable issues to date.

—**Recycling:** AHFC relies heavily on recycling, wherein prepayments are used to make new mortgages, in many of its

bond structures. This technique has reduced the need for future bond financings and state appropriations.

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Platte River Power Authority, Colorado

\$113 million electric revenue bonds due 2018
Sold, February 20, Salomon Brothers Inc.
Rated 'A+'¹

Rationale: The \$113 million issue of Platte River Power Authority electric revenue bonds is rated 'A+', along with \$518 million of outstanding parly debt. The 'A' rating of the Loveland, Colo. electric revenue bonds was reviewed in connection with this sale and is affirmed. The ratings reflect the strength of the participant cities' economic bases and good financial performances. The authority's rates to the cities are low because capacity charges to Public Service Co. of Colorado are sufficient to pay debt service. Bond proceeds will be used to retire all outstanding commercial paper. The authority has refunded the commercial paper program instead of retiring it from revenues as was planned to avoid potential tax problems and to take advantage of current long-term interest rates.

Security: The bonds are secured by take-or-pay contracts with the cities of Fort Collins (45.7% of the project), Longmont (28.1%), Loveland (21.5%), and Estes Park (6.1%). The authority's rate covenant is net revenues 1.25 times (x) adjusted aggregated debt service. Debt service is adjusted to levelize payments of term bonds in 2000 and 2002. The additional bonds test requires net revenues in 12 of the preceding 24 months prior to issuance to meet the rate covenant. Additional security is provided by a debt service reserve fully funded to maximum debt service at the time of bond issuance.

Operations: Platte River's resources include energy and capacity under contract with the Western Area Power Administration (WAPA) through 1989. The authority receives 158mw in the winter and 238mw in the summer. The authority owns the 255mw coal-fired Rawhide Energy Station and an 18% share of the Yampa Project coal-fired Craig units, totaling 154mw. Excess capacity in the Craig and Rawhide units is sold to Public Service under a contract through 1994, which is less than the life of the bonds. Public Service is obligated to take-or-pay for capacity and energy made available in accordance with the schedule in the contract. If the contract schedules are not met, Public Service has the option to terminate the contract. Therefore, these bonds are not rated on the basis of the Public Service contract. Revenue derived from these sales is sufficient to pay all Platte River debt service at this time. In 1995, Platte River sold 340.5mw of capacity per month and 2,380gwh to Public Service.

Platte River expects peak demand to grow at a compound rate of 5.4% per year in the future and for energy sales to grow 5.9% per year. Since 1980, annual growth rates ranged from -3.8% to 16.4% for peak demand and from 3.3% to 11.8% for energy sales. The average growth rates of 5.9% and 5.7%, respectively, were strong despite this volatility. Based on this growth, Platte River expects to sell power from Yampa and Rawhide to participants when sales to Public Service end.

Rates: The authority is currently charging the participants 35 mills per kwh. Retail rates in all cities except Loveland are below those of Public Service and the Poudre Valley cooperative supplied by Tri-state generation and transmission cooperative.

Loveland's rates are only marginally above Public Service's rates. The authority does not anticipate raising rates to the participants until 1991 when it begins taking back its Rawhide capacity. Between 1991 and 1996, rates are expected to rise from 35.2 mills per kwh to 55.2 mills per kwh.

Finances: During the last two years, Platte River changed from a construction-oriented organization to an operating power supplier. The effect of this change is clearer when the operating statements for 1983 and 1984 are compared. Revenues grew 105% in that year and operating expenses grew 107%, primarily due to a 185% increase in depreciation with the start-up of Rawhide. During 1985, only 29.5% of revenues came from sales to the participants, the remainder of the revenues came from sales to Public Service. Annual debt service coverage was 1.48x in 1984 and 1.53x in 1985, including commercial paper interest. The balance sheet continued to improve in 1985. The current ratio was 4.39:1 and the quick ratio was 1.69:1. Leverage declined as the ratio of debt to plant declined to 1.14:1 from 1.20:1.

Participants: Fort Collins, Loveland, and Estes Park are in Larimer County, north of Denver, and Longmont is in Boulder County, west of Denver. The key economic sectors in this area are manufacturing, services, retail trade, and government. High technology electronics are a major source of employment, with manufacturing facilities of Hewlett-Packard Co., Storage Technology Inc., and NCR Inc. located in the participant cities. Colorado State University is another major employer in Fort Collins. The average unemployment rates for 1985 are below the national average in both counties, but rose slightly toward the end of the year to 7.1% in Larimer County and 6.7% in Boulder County. Total numbers employed remained stable.

Participants	Fort Collins	Longmont	Loveland	Estes Park
% Platte River	45.7	28.1	22.5	6.1
Peak demand 1985	110	59	48	14
gwh sold 1985	582	332	258	72
Population est. 1985	83,000	49,800	35,300	7,800
1984 revenue (000)	30,487	17,081	15,820	4,572
Debt serv. cov. (x)	1.48	1.53	5.60	1.00
Current ratio**	5.17:1	3.15:1	6.43:1	N.A.

*No electric revenue bonds outstanding

**Current assets/current liabilities

N.A.—Not available.

The financial performance of the participants is good. Each has had a positive trend in revenues and controlled growth of expenses in recent years. Off-balance sheet debt service coverage is less than 1.00x for all participants because Platte River debt service payments are subsidized through the Public Service contract.

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CS HB 519

CSHB 519 makes the following changes with respect to the original bill:

1. deletes the requirement for State Bond Committee approval of ASHA debt issuance before lease-financing agreements may be entered into (sections 2, 6, 7, and 10 of CS HB 519); however, the State Bond Committee still must approve ASHA debt before it can be issued (section 4 of CS HB 519);
2. requires approval of public buildings by law before lease-financing agreements may be entered into (sections 2, 6, 7, and 10 of CS HB 519);
3. includes construction or acquisition cost in addition to lease payment and bond amount, in notice to legislature and bond committee (sections 2, 6, 7, and 10);
4. makes new subsection (b) in Sec. 8 of the bill into a separate section so that it is not repealed in the event SB 341, the procurement bill, passes; amendments have been prepared for SB 341 which would delete all authority in that bill for lease-purchase financing, so that the subject is dealt with only in HB 519; this is to avoid enactment of conflicting provisions;
5. amends international airports and toll facilities statutes to permit negotiated bond sales in addition to public bid (sections 17, 18, 19, and 20).

James
3/4/86

Original sponsor: Rules/governor

1 IN THE HOUSE

BY THE HOUSE SPECIAL COMMITTEE
ON STATE LOANS

2 CS FOR HOUSE BILL NO. 519 (Loans)

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 FOURTEENTH LEGISLATURE - SECOND SESSION

5 A BILL

6 For an Act entitled: "An Act relating to public finance; and providing for
7 an effective date."

8 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

9 * Section 1. AS 14.40.040 is amended to read:

10 Sec. 14.40.040. GENERAL POWERS OF THE UNIVERSITY. There is
11 created and established a corporation to be called the University of
12 Alaska. It may in that name

13 (1) sue and be sued;

14 (2) receive and hold real and personal property;

15 (3) contract and be contracted with;

16 (4) adopt, use and alter a corporate seal;

17 (5) borrow money, issue debt, or enter into long-term
18 obligations for the purchase of facilities, goods, or services, which
19 obligations secure, in whole or in part, debt issued by another party,
20 as approved by the state bond committee under AS 37.15.770 and ap-
21 proved by law; an appropriation does not constitute approval by law
22 for purposes of this paragraph;

23 (6) do and have done all matters necessary for the purpose
24 of any function set out [FORTH] in this chapter.

25 * Sec. 2. AS 14.40 is amended by adding a new section to read:

26 Sec. 14.40.255. LEASE-FINANCING. The Board of Regents may enter
27 into lease-financing agreements only with the Alaska State Housing
28 Authority acting as the Alaska State Building Authority. A lease-
29 financing agreement must provide that

1 annual appropriation. If the board intends to enter into an agreement
2 under this subsection, the board shall provide notice to the legisla-
3 ture and to the state bond committee. The notice must include the
4 anticipated annual lease payment, the anticipated principal amount of
5 the debt to be issued by the Alaska State Housing Authority acting as
6 the Alaska State Building Authority, and the anticipated total con-
7 struction or acquisition cost of the project. The board may not enter
8 into an agreement under this section unless the public building to be
9 provided has been approved by law. An appropriation for the project
10 does not constitute approval by law for purposes of this section.

11 * Sec. 3. AS 18.55.100(a)(15) is amended to read:

12 (15) acting as the Alaska State Building Authority arrange
13 or contract for the financing or [, DESIGN, CONSTRUCTION AND] acqui-
14 sition of public buildings designed by, constructed by, or whose acqui-
15 sition has been approved by the Department of Transportation and
16 Public Facilities for lease to the state in accordance with AS 18.55.-
17 010 - 18.55.290 and AS 37.15.770.

18 * Sec. 4. AS 18.55.140 is amended to read:

19 Sec. 18.55.140. ISSUANCE OF BONDS, NOTES, AND REFUNDING BONDS.
20 The authority may issue bonds and notes from time to time in its
21 discretion for any of its corporate purposes and may issue refunding
22 bonds for the purpose of paying or retiring bonds previously issued by
23 it. The authority may not issue bonds for public buildings until the
24 state bond committee has approved the proposal for the issuance of
25 debt under AS 37.15.770, and the building has been approved by law. An
26 appropriation for the building does not constitute approval by law for
27 purposes of this section.

28 * Sec. 5. AS 18.55.140 is amended by adding a new subsection to read:

29 (b) Bonds issued by the authority for public buildings must be

1 issued in the name of the Alaska State Building Authority and are
2 subject to AS 18.55.010 - 18.55.290.

3 * Sec. 6. AS 18.55.288 is amended by adding a new paragraph to read:

4 (4) "bond" means any bond, note, interim certificate,
5 debenture, or other obligation issued by the authority or the author-
6 ity acting as the Alaska State Building Authority under AS 18.55.010 -
7 18.55.290;

8 * Sec. 7. AS 22.05.025 is amended by adding a new subsection to read:

9 (c) The supreme court may enter into lease-financing agreements
10 only with the Alaska State Housing Authority acting as the Alaska
11 State Building Authority. A lease-financing agreement must provide
12 that lease payments are subject to annual appropriation. If the
13 supreme court intends to enter into an agreement under this subsec-
14 tion, the supreme court shall provide notice to the legislature and to
15 the state bond committee. The notice must include the anticipated
16 annual lease payment, the anticipated principal amount of the debt to
17 be issued by the Alaska State Housing Authority acting as the Alaska
18 State Building Authority, and the anticipated total construction or
19 acquisition cost of the project. The supreme court may not enter into
20 an agreement under this subsection unless the public building to be
21 provided has been approved by law. An appropriation for the project
22 does not constitute approval by law for purposes of this section.

23 * Sec. 8. AS 24.23 is amended by adding new sections to read:

24 ARTICLE 2. LEASE AGREEMENTS.

25 Sec. 24.23.100. LEASE OF SPACE. The Legislative Affairs Agency
26 may lease necessary office space, and contract for the lease of space,
27 for the use of the Alaska legislature and its employees.

28 Sec. 24.23.110. The Legislative Affairs Agency may enter into
29 lease-financing agreements only with the Alaska State Housing

1 Authority acting as the Alaska State Building Authority. A lease-
2 financing agreement must provide that lease payments are subject to
3 annual appropriation. If the agency intends to enter into an agree-
4 ment under this subsection, the agency shall provide notice to the
5 legislature and to the state bond committee. The notice must include
6 the anticipated annual lease payment, the anticipated principal amount
7 of the debt to be issued by the Alaska State Housing Authority acting
8 as the Alaska State Building Authority, and the anticipated total
9 construction or acquisition cost of the project. The agency may not
10 enter into an agreement under this section unless the public building
11 to be provided has been approved by law. An appropriation for the
12 project does not constitute approval by law for purposes of this
13 section.

14 * Sec. 9. AS 37.05.280 is amended to read:

15 Sec. 37.05.280. LEASES. The department shall lease necessary
16 space, and contract for the lease of space, for the use of the state
17 or an agency of the state, wherever it is necessary and feasible,
18 subject to compliance with the requirements of AS 37.05.220 - 37.05.-
19 280. A [NO] lease or contract for a lease may not provide for a
20 period of occupancy greater than 40 years. A lease agreement must
21 provide that lease payments are subject to annual appropriation. An
22 agency of the state requiring office, warehouse, or other space shall
23 lease the space through the department. [NO CONTRACT OR LEASE EX-
24 ECUTED AFTER JANUARY 1, 1966, WHICH PROVIDES FOR A PAYMENT OR PAYMENTS
25 BY THE STATE IN EXCESS OF \$12,000 ANNUALLY IS VALID UNLESS THE USE OF
26 THE SPACE TO BE PROVIDED FOR BY SUCH CONTRACT OR LEASE HAS BEEN EX-
27 PRESSLY APPROVED BY THE LEGISLATURE BY CONCURRENT RESOLUTION.]

28 * Sec. 10. AS 37.05 is amended by adding a new section to read:

29 Sec. 37.05.285. LEASE FINANCING. The department may enter into

1 lease-financing agreements only with the Alaska State Housing Author-
2 ity acting as the Alaska State Building Authority. A lease-financing
3 agreement must provide that lease payments are subject to annual
4 appropriation. If the department intends to enter into an agreement
5 under this subsection, the department shall provide notice to the
6 legislature and to the state bond committee. The notice must include
7 the anticipated annual lease payment, the anticipated principal amount
8 of the debt to be issued by the Alaska State Housing Authority acting
9 as the Alaska State Building Authority, and the anticipated total
10 construction or acquisition cost of the project. The department may
11 not enter into an agreement under this subsection unless the public
12 building to be provided has been approved by law. An appropriation
13 for the project does not constitute approval by law for purposes of
14 this section.

15 * Sec. 11. AS 37.15.040 is amended to read:

16 Sec. 37.15.040. SALE OF BONDS. Before selling an issue or
17 series of bonds, the state bond committee shall give notice inviting
18 sealed bids in the [SUCH] manner [AS] it may prescribe. If satisfac-
19 tory bids are received, the bonds offered for sale shall be awarded to
20 the highest responsible bidder or bidders. If the state bond commit-
21 tee determines that the bids received are not satisfactory as to price
22 or responsibility of the bidders, it may reject all bids received.

23 * Sec. 12. AS 37.15.110 is amended to read:

24 Sec. 37.15.110. CREATION AND MEMBERSHIP OF STATE BOND COMMITTEE.
25 There is created within the Department of Revenue a committee known as
26 the "state bond committee," the members of which are the commissioner
27 of commerce and economic development, the commissioner of administra-
28 tion, and the commissioner of revenue. If a member of the committee
29 is absent or otherwise unable to act, the member's designee [IN THE

1 DEPARTMENT} shall act as a member of the committee in the member's
2 place.

3 * Sec. 13. AS 37.15.130 is amended to read:

4 Sec. 37.15.130. OFFICERS, RECORDS AND PROCEEDINGS. The commis-
5 sioner of commerce and economic development is the chairman of the
6 state bond committee and the commissioner of revenue is the secretary.
7 A majority of the members of the committee constitute a quorum. The
8 committee shall keep a full, complete, and permanent record of its
9 proceedings. All records and correspondence of the committee shall
10 be kept in the office of the commissioner of revenue. For the purpose
11 of this chapter and AS 44.62.310, public notice of 24 hours or more is
12 adequate notice of a meeting of the committee at which the issuance of
13 bonds is authorized.

14 * Sec. 14. AS 37.15.140 is amended to read:

15 Sec. 37.15.140. DUTIES OF STATE BOND COMMITTEE. ^(a) The state bond
16 committee shall adopt the resolution and prepare the documents neces-
17 sary for the issuance, sale, and delivery of state general obligation
18 bonds.

19 * Sec. 15. AS 37.15.140 is amended by adding new subsections to read:

20 (b) The state bond committee shall prepare an annual report to
21 be submitted to the governor and legislature before March 31 of each
22 year. The report must show

23 (1) all outstanding debt of debt-issuing entities of the
24 state;

25 (2) the anticipated effect on the finances and credit of
26 the state, including the effect on long-term debt capacity and credit-
27 worthiness, resulting from that debt;

28 (3) which long-term debt is state supported and which is
29 supported only by revenue attributable to the project being financed

1 by the debt;

2 (4) all long-term capital lease obligations of the state;

3 (5) the volume of short-term debt issued and retired during
4 the year by debt-issuing entities of the state;

5 (6) specific identification of each issue for which the
6 state has pledged some form of indirect support for the debt, includ-
7 ing any moral obligation of the state to support the debt;

8 (7) future bonding and debt capacity implications of legis-
9 lation enacted in the previous legislative session; and

10 (8) the recommended debt issuance capacity of the state for
11 the next two years following the year of the report.

12 (c) The state bond committee may develop written policies con-
13 cerning debt of the state.

14 * Sec. 16. AS 37.15.150 is amended to read:

15 Sec. 37.15.150. STAFF AND [COMMITTEE MAY EMPLOY] SPECIAL SER-
16 VICES. The state bond committee may appoint an executive director who
17 may, with approval of the committee, select and employ additional
18 staff as necessary. Employees of the committee are in the partially
19 exempt service under AS 39.25.120. If the [STATE BOND] committee
20 considers it necessary and advisable, it may procure architectural or
21 engineering, fiscal agent or municipal investment, legal, and other
22 expert or specialized services at reasonable and customary fees to
23 assist it in accomplishing the most advantageous sale of the bonds.
24 The fees may be paid from the proceeds of the sale or advanced from
25 the contingency fund in the Office [OFFICE] of the Governor [GOVERNOR]
26 or otherwise.

27 * Sec. 17. AS 37.15.450(a) is amended to read:

28 (a) The bonds shall be sold in the manner, price or prices,
29 [SUCH] amounts or series, and at the [SUCH] time or times [AS]

1 determined by the committee at either public or private sale. [BEFORE
2 SELLING A SERIES OF BONDS, THE COMMITTEE SHALL GIVE NOTICE INVITING
3 SEALED BIDS IN SUCH MANNER AS IT MAY PRESCRIBE. IF SATISFACTORY BIDS
4 ARE RECEIVED, THE BONDS OFFERED FOR SALE SHALL BE AWARDED TO THE
5 HIGHEST RESPONSIBLE BIDDER. IF THE COMMITTEE DETERMINES THAT THE BIDS
6 RECEIVED ARE NOT SATISFACTORY AS TO PRICE OR RESPONSIBILITY OF THE
7 BIDDERS, IT MAY REJECT ALL BIDS RECEIVED.] The bonds, or each series
8 of them, shall be sold at such a price so that the effective interest
9 rate over the life of the bonds does not exceed 11 percent per year or
10 that rate of interest which is 125 percent of the rate of the Bond
11 Buyer Index of 20 Municipal Bond Average Yields for the week previous
12 to the date of sale of the bonds, whichever is higher. Interest shall
13 be payable annually or semiannually.

14 * Sec. 18. AS 37.15.460 is amended to read:

15 Sec. 37.15.460. BOND RESOLUTION. The committee is authorized
16 and directed to adopt the bond resolution and prepare all other docu-
17 ments and proceedings necessary for the issuance, sale and delivery of
18 the bonds or any part or series of them. The bond resolution shall
19 fix the principal amount, denomination, date, maturities, place or
20 places of payment, rights of redemption, if any, terms, form, condi-
21 tions and covenants of the bonds or each series of them. The commit-
22 tee shall also determine and provide for the date and manner of sale
23 of the bonds, and shall provide where a [WHETHER THE] notice of sale,
24 if any, is to be published [ELSEWHERE IN ADDITION TO THE PUBLICATION
25 REQUIRED BY AS 37.15.450].

26 * Sec. 19. AS 37.15.650(a) is amended to read:

27 (a) The toll facilities bonds are sold in the manner, price or
28 prices, amounts or series, and at the time as determined by the com-
29 mittee, at either public or private sale. [BEFORE SELLING A SERIES OF

1 BONDS, THE COMMITTEE SHALL GIVE NOTICE INVITING SEALED BIDS. IF
2 SATISFACTORY BIDS ARE RECEIVED, THE BONDS OFFERED FOR SALE ARE AWARDED
3 TO THE HIGHEST RESPONSIBLE BIDDER. IF THE COMMITTEE DETERMINES THAT A
4 BID RECEIVED IS NOT SATISFACTORY AS TO PRICE OR RESPONSIBILITY OF THE
5 BIDDER, THE COMMITTEE MAY REJECT THE BID RECEIVED.] Bonds, or a
6 series of bonds, may not be sold if the effective interest rate over
7 the life of the bonds exceeds 11 percent per year or that rate of
8 interest that is 125 percent of the rate of the Bond Buyer Index of 20
9 Municipal Bond Average Yields for the week previous to the date of
10 sale of the bonds, whichever is higher. Interest is payable annually
11 or semiannually.

12 * Sec. 20. AS 37.15.660 is amended to read:

13 Sec. 37.15.660. BOND RESOLUTION. The committee is authorized
14 and directed to adopt the bond resolution and prepare all other docu-
15 ments and proceedings necessary for the issuance, sale, and delivery
16 of the bonds or any part or series of them. The bond resolution shall
17 fix the principal amount, denomination, date, maturities, place or
18 places of payment, rights of redemption, if any, terms, form, condi-
19 tions, and covenants of the bonds or each series of them. The commit-
20 tee shall also determine and provide for the date and manner of sale
21 of the bonds, and shall provide where a [WHETHER THE] notice of sale,
22 if any, is to be published [ELSEWHERE IN ADDITION TO THE PUBLICATION
23 REQUIRED BY AS 37.15.650].

24 * Sec. 21. AS 37.15 is amended by adding new sections to read:

25 ARTICLE 5. STATE-SUPPORTED DEBT.

26 Sec. 37.15.770. STATE AGENCY DEBT. (a) The state bond commit-
27 tee shall review proposals for the issuance of debt by or on behalf of

28 (1) the Alaska State Housing Authority acting as the Alaska
29 State Building Authority for the purpose of providing public

1 buildings; and

2 (2) the University of Alaska.

3 (b) The committee may review the general programs and financing
4 plans of the agency that proposes to issue the debt as well as the
5 specific aspects of the proposed debt issue, including

6 (1) amounts;

7 (2) times;

8 (3) maturities;

9 (4) debt structure and security features;

10 (5) credit enhancements;

11 (6) use of proceeds;

12 (7) official documents;

13 (8) planned rating agency presentations; and

14 (9) selection, retention, or compensation of financial
15 advisors, bond counsel, trustees, underwriters, and other profession-
16 als.

17 (c) The state bond committee shall consider approval of the
18 amount and time of sale of the debt. The committee shall approve the
19 issuance of the debt if, in its judgment, issuance of the debt is in
20 the best interests of the state. The committee may limit approval of
21 the issuance of debt upon compliance with terms established by the
22 committee.

23 (d) At the time of sale of the debt, the state bond committee
24 shall review the bids or pricing of the debt, including discounts,
25 underwriting spreads, and interest rates. If the committee determines
26 that the bids or prices are not satisfactory or that the bidders are
27 not responsible, the agency may not sell the debt.

28 Sec. 37.15.790. MUNICIPAL SCHOOL DEBT. If, at any time, the
29 state bond committee, in its judgment, determines that the amount or

1 retirement of debt issued by municipalities and subject to reimburse-
2 ment by the state under AS 14.11.100 is not in the best interest of
3 the state, the committee may

4 (1) establish an amount or amounts, for any or all years
5 before the maturity of all of that municipal debt, that may not be
6 exceeded by the Department of Education in approving requests under
7 AS 14.11.103; or

8 (2) establish, under AS 14.11.100(j)(3), a term required
9 for the maturities of municipal debt authorized by local voters after
10 March 31, 1986.

11 * Sec. 22. AS 39.25.120(c) is amended by adding a new paragraph to
12 read:

13 (19) employees of the state bond committee.

14 * Sec. 23. This Act takes effect immediately in accordance with AS 01.-
15 10.070(c).

TABLE 1.21 (DRAFT FOR ALASKA PUBLIC DEBT 1986)

Debt of Alaska Municipalities
6-30-85
(Dollars)

<u>Boroughs</u>	<u>G.O. Debt</u>	<u>Revenue Debt</u>	<u>Total Debt</u>	<u>School G.O. Debt</u>	<u>% of School Debt Paid by State</u>	<u>Net G.O. Debt</u>	<u>Total Net Debt</u>
ANCHORAGE, MUNICIPALITY OF	358,799,900	347,080,000	705,879,900	139,965,000	94 %	227,232,800	574,312,800
BRISTOL BAY	3,535,000	-	3,535,000	3,535,000	90	353,500	353,500
FAIRBANKS NORTH STAR	80,700,000	-	80,700,000	79,900,000	92	7,192,000	7,192,000
Fairbanks City	9,010,000	61,170,000	70,180,000	-	-	9,010,000	70,180,000
North Pole	1,218,550	-	1,218,550	-	-	1,218,550	1,218,550
TOTAL	90,928,500	61,170,000	152,098,500	79,900,000	92	17,420,550	78,591,050
HAINES	555,000	-	555,000	500,000	100	-	-
Haines City	745,000	-	745,000	-	-	745,000	745,000
TOTAL	1,300,000	-	1,300,000	500,000	100	800,000	800,000
JUNEAU, CITY & BOROUGH	47,651,000	27,480,000	75,131,000	30,209,018	91	20,160,794	47,640,794
KENAI PENINSULA	119,324,005	-	119,324,005	100,120,000	90	29,216,005	29,216,005
Homer City	2,113,000	1,025,000	3,138,000	-	-	2,113,000	3,138,000
Kenai City	5,835,000	235,000	6,070,000	-	-	5,835,000	6,070,000
Seldovia City	378,000	43,000	421,000	-	-	378,000	421,000
Seward City	10,000	7,672,000	7,682,000	-	-	10,000	7,682,000
Soldotna City	2,800,000	-	2,800,000	-	-	2,800,000	2,800,000
TOTAL	130,460,005	8,975,000	139,435,005	100,120,000	90	40,352,005	49,327,005
KETCHIKAN GATEWAY	21,090,000	410,000	21,500,000	16,445,000	92	5,960,600	6,370,600
Ketchikan City	10,840,000	23,280,000	34,120,000	-	-	10,840,000	34,120,000
TOTAL	31,930,000	23,690,000	55,620,000	16,445,000	92	16,800,600	40,490,600
KODIAK ISLAND	25,815,000	-	25,815,000	25,515,000	91	2,596,350	2,596,350
Kodiak City	2,455,000	3,298,000	5,753,000	-	-	2,455,000	5,753,000
TOTAL	28,270,000	3,298,000	31,568,000	25,515,000	91	5,051,350	8,349,350
MATANUSKA-SUSITNA	110,160,000	-	110,160,000	95,120,000	90	24,552,000	24,552,000
Palmer City	2,048,000	290,000	2,338,000	-	-	2,048,000	2,338,000
TOTAL	112,208,000	290,000	112,498,000	95,120,000	90	26,600,000	26,890,000
NORTH SLOPE	1,155,680,000	-	1,155,680,000	207,220,000	97	954,676,600	954,676,600
SITKA, CITY & BOROUGH	12,400,000	53,675,000	66,075,000	2,052,258	100	10,347,742	64,022,742
 TOTAL BOROUGHs	 1,973,162,405	 525,658,000	 2,498,820,405	 700,581,276	 93 %	 1,319,795,941	 1,845,453,941

TABLE 1.21 (continued)

<u>Cities</u>	<u>G.O. Debt</u>	<u>Revenue Debt</u>	<u>Total Debt</u>	<u>School G.O. Debt</u>	<u>% of School Debt Paid by State</u>	<u>Net G.O. Debt</u>	<u>Total Net Debt</u>
Bethel	556,505	535,000	1,091,505	-	- %	556,505	1,091,508
Cordova	-	1,456,000	1,456,000	-	-	-	1,456,000
Craig	35,646	87,000	128,646	-	-	35,646	120,646
Dillingham	-	286,000	286,000	-	-	-	286,000
Galena	900,000	-	900,000	-	-	900,000	900,000
Hoonah	-	-	-	-	-	-	-
Hydaburg	-	-	-	-	-	-	-
Kake	-	86,000	86,000	-	-	-	86,000
King Cove	-	-	-	-	-	-	-
Klawock	-	-	-	-	-	-	-
Kotzebue	-	-	-	-	-	-	-
Nenana	397,356	2,320,000	2,717,356	190,000	100	207,356	2,527,356
Nome	2,161,250	-	2,161,250	-	-	2,161,250	2,161,250
Pelican	-	-	-	-	-	-	-
Petersburg	6,195,000	4,367,835	10,562,835	4,826,500	96	1,561,560	5,929,395
St. Mary's	-	-	-	-	-	-	-
Sand Point	-	-	-	-	-	-	-
Skagway	820,000	-	820,000	-	-	820,000	820,000
Tanana	-	-	-	-	-	-	-
Unalaska	3,299,032	429,216	3,728,248	925,000	90	2,466,532	2,895,748
Valdez	75,833,000	7,650,000	83,483,000	22,585,000	94	54,603,100	62,253,100
Whittier	-	-	-	-	-	-	-
Wrangell	10,750,000	812,600	11,562,600	9,385,777	82	3,053,663	3,866,263
Yakutat	235,193	490,476	725,669	-	-	235,193	725,669
TOTAL CITIES	101,182,982	18,520,127	119,703,109	37,912,277	91	66,600,805	85,120,932
TOTAL MUNICIPALITIES	2,074,345,387	544,178,127	2,618,523,514	738,493,553	93 %	1,386,396,746	1,930,574,873

Sources: Alaska Department of Education and Alaska Taxable 1985, Alaska Department of Community and Regional Affairs.

TABLE 1.22

Alaska Municipal Debt Ratios (DRAFT FOR ALASKA PUBLIC DEBT 1986)
6-30-85

Boroughs	Full Value	Population	GO Debt Per Capita	Ratio of GO Debt to Full Value	Net GO Debt Per Capita ^{1/}	Ratio of Net GO Debt to Full Value ^{1/}
ANCHORAGE, MUNICIPALITY OF	\$15,755,411,000	248,263	\$1,445	2.28%	\$915	1.44%
BRISTOL BAY	101,798,800	1,271	2,781	3.47	278	.35
FAIRBANKS NORTH STAR	2,564,966,300	46,340				
Fairbanks City	1,458,574,300	27,099	332	.62	332	.62
North Pole	187,457,100	1,640	742	.65	742	.65
TOTAL	4,210,997,700	75,079	1,211	2.16	232	.41
HAINES	49,029,200	768				
Haines City	44,916,300	1,079	690	1.66	690	1.66
TOTAL	93,945,500	1,847	703	1.38	433	.85
JUNEAU, CITY & BOROUGH	1,613,388,900	29,370	1,622	2.95	686	1.25
KENAI PENINSULA	2,417,376,100	22,321				
Homer City	215,845,000	3,817	553	.98	553	.98
Kenai City	282,950,000	6,434	906	2.06	906	2.06
Seldovia City	16,451,300	678	557	2.30	557	2.30
Seward City	142,170,600	2,072	5	.01	5	.01
Soldotna City	215,425,400	3,597	778	1.30	778	1.30
TOTAL	3,290,219,200	38,919	3,352	3.97	1,037	1.23
KETCHIKAN GATEWAY	284,545,100	5,900				
Ketchikan City	391,440,000	8,414	1,288	3.81	1,288	3.81
TOTAL	675,985,100	14,314	2,230	4.72	1,174	2.49
KODIAK ISLAND	180,536,600	7,146				
Kodiak City	391,834,100	6,602	371	.63	371	.63
TOTAL	572,370,700	13,748	2,056	4.94	367	.88
MATANUSKA-SUSITNA	2,225,993,800	38,077				
Palmer City	141,412,400	3,016	679	1.45	679	1.45
TOTAL	2,367,406,200	41,093	2,730	4.74	647	1.12
NORTH SLOPE		12,342	93,638		77,352	
AS 29.53.045(b) Tax Limit	12,876,786,900			8.97		7.41
AS 29.53.045(c) Tax Limit	2,397,118,779			48.21		39.83
SITKA, CITY & BOROUGH	396,227,900	8,221	1,508	3.13	1,259	2.61
TOTAL BOROUGHs	41,954,537,900 ^{2/}	484,467	4,073	4.70	2,724	3.15

TABLE 1.22 (continued)

<u>Cities</u>	<u>Full Value</u>	<u>Population</u>	<u>GO Debt Per Capita</u>	<u>Ratio of GO Debt to Full Value</u>	<u>Net GO Debt Per Capita^{1/}</u>	<u>Ratio of Net GO Debt to Full Value^{1/}</u>
Bethel	\$182,296,900	3,681	\$151	.31%	\$151	.31%
Cordova	120,673,000	2,520				
Craig	34,707,400	1,167	31	.10	31	.10
Delta Junction	30,870,500	1,207				
Dillingham	94,669,900	2,100				
Eagle	9,104,500	194				
Galena	19,149,500	942	955	4.70	955	4.70
Hoonah	27,845,200	906				
Hydaburg	12,688,900	463				
Kake	11,608,000	633				
King Cove	23,230,800	547				
Klawock	5,563,000	600				
Kotzebue	93,245,100	2,981				
Nenana	12,881,500	542	733	3.08	383	2.10
Nome	116,712,900	3,876	558	1.85	558	1.85
Pelican	10,155,400	213				
Petersburg	161,219,300	3,137	1,975	3.84	498	.97
St. Mary's	4,239,400	563				
Sand Point	71,086,800	900				
Skagway	58,447,100	790	1,038	1.40	1,038	1.40
Tanana	11,195,400	425				
Unalaska	105,309,400	1,922	1,716	3.13	1,283	2.34
Unalakleet	19,714,500	787				
Valdez		3,687	20,581		14,810	
AS 29.53.045(b) Tax Limit	1,740,431,900			4.36		3.14
AS 29.53.045(c) Tax Limit	716,105,732			10.59		7.63
Whittier	19,419,200	338				
Wrangell	111,757,000	2,376	4,524	9.62	1,285	2.73
Yakutat	17,679,400	462	509	1.33	509	1.33
TOTAL CITIES	3,125,901,900 ^{2/}	37,959	2,666	3.24	1,755	2.13
TOTAL MUNICIPALITIES	45,080,439,800	522,426	3,971	4.61	2,654	3.08
TOTAL STATEWIDE	48,915,237,900	566,657				

Source: Alaska Taxable 1985, Alaska Department of Community & Regional Affairs^{1/} Net of school debt.^{2/} Excludes the City of Anchorage.

PROPOSED DRAFT LANGUAGE
FOR MUNICIPAL SCHOOL DEBT SECTION OF
ALASKA PUBLIC DEBT 1986

As of June 30, 1985, \$738 million of municipal school debt was outstanding. Under a program enacted in 1970 (Alaska Statutes 14.11.100) the State will reimburse the municipalities for debt service on certain portions of that debt. On June 30, 1985, the aggregate total percentage of municipal school debt to be reimbursed by the State was 93%. The State share of municipal school debt was thus \$687 million.

Because the statute which provides for reimbursement of a portion (100, 90 or 80 percent) of debt service on municipal school debt specifies a two year lag between payment by the municipality and reimbursement by the State for debt incurred prior to January 1, 1982, some principal and interest paid during the fiscal years ending June 30, 1984 and June 30, 1985 has not yet been reimbursed. The State share of municipal school debt outstanding on June 30, 1985 plus the State share of municipal school debt principal payments made by the municipalities during prior years but not yet reimbursed by the State amounted to a total of \$754 million. If added to the total of State and State supported debt, the amount of the State's principal outstanding on that debt would have been \$1,686 million.

On October 1, 1985 voters in six municipalities approved the issuance of an additional \$303 million of general obligation school debt. Most of that debt will have been issued by June 30, 1986. Voters in the City of Sitka approved the issuance of \$22.6 million of general obligation school debt in a special election on January 27, 1986. Voters in the Kodiak Island Borough will decide on the issuance of almost \$10 million of general obligation school debt in a special election on March 25, 1986. If issued, current statute provides for State reimbursement of up to eighty percent of the debt service on that debt during the year in which the payments are made.

Original sponsor: Rules/governor

1 IN THE HOUSE

BY THE HOUSE SPECIAL
COMMITTEE ON STATE LOANS

2 CS FOR HOUSE BILL NO. 521 (Loans)

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 FOURTEENTH LEGISLATURE - SECOND SESSION

5 A BILL

6 For an Act entitled: "An Act relating to the issuance of municipal general
7 obligation bonds; and providing for an effective
8 date."

9 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

10 * Section 1. AS 29.10.200 is amended by adding a new paragraph to read:

11 (47) AS 29.47.190 - 29.47.195 (notice of and limitation on
12 debt).

13 * Sec. 2. AS 29.47.190(b) is amended to read:

14 (b) Before a general obligation bond issue election, the govern-
15 ing body shall have published a notice of the total existing bond
16 indebtedness at least once a week for three consecutive weeks. The
17 first notice shall be published at least 20 days before the date of
18 the election. A notice must [SHALL] include

19 (1) the current total general obligation bonded indebted-
20 ness, including authorized but unsold bonds, of the municipality;

21 (2) the cost of the debt service on the current indebted-
22 ness;

23 (3) the total assessed value of taxable property in the
24 municipality;

25 (4) the full value of taxable property in the municipality
26 as determined by the department; and

27 (5) for a city in a borough, the current total general
28 obligation bonded indebtedness of the borough, including authorized but
29 unsold bonds.