Proposed Diesel PM Control Technology
Demonstration Program for Portable Engines

The Diesel Risk Reduction Plan identified various control technologies available to reduce PM emissions from diesel engines. As staff investigated these technologies further, a variety of issues and concerns arose regarding the effectiveness and applicability of these technologies. More specifically, which control technologies would work on which engines under which modes of operation. In addition, several of these issues and concerns are unique to portable engine applications due to the mobile nature of portable engines.

Staff is proposing the following studies to characterize the types of engines, engine applications, and modes of operation that affect the applicability of control technologies.

Table 1: Proposed Demonstration Studies

Activity	Description
Temperature Profiling	Gather temperature profiles from 200 portable diesel engines.
Engine Operational Data	Gather engine operational data from those engines with electronic controls utilizing the manufacturer's scan tools software.
Retrofits	Conduct a retrofit demonstration program for portable diesel engines.

Which engines will be the focus for demonstration projects?

Staff has performed an analysis of equipment registered in the Portable Equipment Registration Program to identify the engine application categories and engine types associated with that equipment. Within each engine application category, staff has identified the frequency distribution of specific engine types, manufactures, and horsepower ratings. These engine applications and predominate engine types are listed in Table 2.

Table 2: Engine Applications and Predominate Engine Types in PERP

Engine Application	Manufacturer	Model	Horsepower	# of Engines in PERP
Generator	Caterpillar	3406	500	189
	Caterpillar	3306	300	135
	Caterpillar	3304	200	125
	Cummins	QSK45-G4	1,850	114
	John Deere	4045TF150	100	110
	Isuzu	4BG1	80	107
	Caterpillar	3516	2,600	104
Compressor	John Deere	4045DF150	80	456
	John Deere	4239	80	114
	John Deere	4039D	80	94
	Detroit Diesel	8V92TA	430	64
	Cummins	N14-C	400	63
Pump	John Deere	4039D	80	175
	John Deere	4045	80	122
	John Deere	6081	225	72
	Detroit Diesel	8V92TA	430	62
Oilfield Service	Detroit Diesel	5033-7001	90	96
Drilling	Caterpillar	D398	1,000	89
Processing	Deutz	BFM1012C	100	74
Dredge	Caterpillar	D398	1,000	6

As an initial step staff proposes to conduct temperature profiling studies for the group of engines identified in Table 2. The information collected from this initial study will be used to characterize exhaust temperatures associated with the operating cycles of specific engine application categories as they apply to the installation and applicability of DPFs or other control technologies.

The temperature profiling study will involve the following tasks. Table 3 gives the estimated timeframe for completing each task.

1. Meet with MECA and EMA to discuss their experiences with conducting temperature profiles and to identify the proper procedures needed to conduct temperature profiling.
2. Identify the engine applications, makes, models, and horsepower rating to be used for temperature profiling.
3. Identify owners of engines for the temperature profiling study.
4. Install temperature probe and datalogger.
5. Collect data from the datalogger.
6. Remove temperature probe and datalogger and reinstall the equipment on another engine.
7. ARB staff prepares a report.

Table 3: Temperature Profiling Tasks and Estimated Timeframe

Task	Timeframe
Meet with MECA and EMA to discuss proper temperature profiling procedures.	February
Identify engines to conduct temperature profiling.	February
Identify engine owners willing to participate.	February/March
Purchase 20 dataloggers	January
Install 20 dataloggers	February/March/April
Collect Data	March-July
Final Removal of dataloggers.	July
Analyze and prepare report.	August
Final Report	September

To further identify and characterize issues associated with portable engines, specific engine and engine application categories will be retrofitted with DPFs and other control technologies. Specific engines and engine application categories for this study are identified in Table 4.

Table 4: Engine and Engine Application Categories for Retrofit with DPFs and Other Control Technologies

Engine Application	Engine Manufacture	Model	HP	Control Technology
Dredge	Caterpillar	D398	1,000	Active DPF
Drilling	Caterpillar	D398	1,000	Other control technology
Generator	Caterpillar	3406	500	DPF
Compressor	Detroit Diesel	8V92TA	430	DPF
Pump	John Deere	6081	225	DPF
Oilfield Service	Detroit Diesel	5033-7001	90	Other control technology
Compressor	John Deere	4045DF150	80	DPF
Compressor	John Deere	4039D	80	Other control technology
Pump	John Deere	4039D	80	DPF
Pump	John Deere	4045	80	Other control technology