State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 05-6

January 20, 2005

Agenda Item No.: 05-1-2

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, a research proposal, number 2568-246, entitled “Development of an Improved VOC Analysis Method for Architectural Coatings”, has been submitted by California Polytechnic State University, San Luis Obispo;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 2568-246 entitled “Development of an Improved VOC Analysis Method for Architectural Coatings”, submitted by California Polytechnic State University, San Luis Obispo for a total amount not to exceed $267,556.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 2568-246 entitled “Development of an Improved VOC Analysis Method for Architectural Coatings”, submitted by California Polytechnic State University, San Luis Obispo, for a total amount not to exceed $267,556.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed $267,556.

I hereby certify that the above is a true and correct copy of Resolution 05-6, as adopted by the Air Resources Board.

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Lori Andreoni, Clerk of the Board

ATTACHMENT A

"Development of an Improved VOC Analysis Method for Architectural Coatings"

Background

To achieve reduction in VOC emissions, the Air Resources Board has adopted suggested control measures and the local Air Quality Management Districts (AQMDs) have adopted regulations which limit the VOC content of architectural coatings. The VOC limits of these regulations will be lower in the future as additional VOC emissions reductions will be needed to meet ambient air quality standards. At these lower VOC limits there will be greater inaccuracy and imprecision in the test method that is used to measure the VOC content of water borne coatings. The same problem exists for solvent based coatings with high concentrations of exempt VOC compounds. The inaccuracy and imprecision of the existing test method result from the fact that the VOC content of water borne coatings, and for solvent borne coatings with high levels of exempts, is measured indirectly, not directly. The total volatile matter content and the water content of the coating are measured, and the VOC content is calculated as the difference between these two quantities. As VOC levels become low, the total volatile matter content and the water content are nearly equal. Taking the difference in these two quantities that are nearly equal results in an imprecise and inaccurate value for the calculated VOC content.

Objective

The objective of the project is to develop a direct method to measure the VOC content of water based coatings and solvent based coatings with high concentrations of exempt compounds. A direct method of VOC measurement will not have the inherent inaccuracy and imprecision of the indirect method that is currently being used.

Methods

The contractor will first analyze the types of coatings for which the existing test method is most imprecise and inaccurate. Confidence intervals will be developed for the measured VOC content for different coatings. The contractor will formulate about 60 paints from different paint categories and with different VOC levels and then, using a recently developed approach to directly measure the VOC content of paints using Gas Chromatography, measure the VOC content of these paints. The contractor will then compare the measured VOC values with the known VOC contents. This comparison will allow the contractor to refine the actual measurement technique to reduce the levels of inaccuracy and imprecision.

Expected Results

The expected results will be a method to measure the VOC content of water-borne paints and solvent based paints with high exempt compounds that is more accurate and precise.

Significance to the Board

The new test method will allow the Board and the local AQMDS to more reliably enforce the more stringent VOC limits of coatings regulations, thus ensuring that the planned and anticipated emissions reductions occur.

Contractor:

California Polytechnic State University, San Luis Obispo

Contract Period:
36 months

Principal Investigator (PI):
Dane Jones, Ph.D.

Contract Amount:
$267,556

Basis for Indirect Cost Rate:
State negotiated rate with the California State University System.

Past Experience with this Principal Investigator:
The principal investigator was a member of a team that recently successfully completed a study for the ARB on the effect of the solids content on the hiding ability of paints and how this relates to the paints' VOC content.

Prior Research Division Funding to CalPoly, SLO:

Year	2004	2003	2002
Funding	$0	$0	$0

B U D G E T S U M M A R Y

California Polytechnic State University, San Luis Obispo

Development of an Improved VOC Analysis Method for Architectural Coatings

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	97,932	
2.	Subcontractors	$	0	
3.	Equipment	$	104,253[1]	
4.	Travel and Subsistence	$	1,776	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	350	
7.	Mail and Phone	$	300	
8.	Supplies	$	5,800	
9.	Analyses	$	0	
10.	Miscellaneous	$	0	
	Total Direct Costs			$210,411
INDIRECT COSTS				
1.	Overhead	$	57,145	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	0	
	Total Indirect Costs			$57,145
TOTAL PROJECT COSTS				**$267,556**

[1] Equipment:

Agilent Gas Chromatograph with Mass Spectroscopy detector	69,499
Headspace attachment	26,135
Ion gauge	1,400
Flame Ionization Detector	3,771
NIST library.	3,448
	$104,253