Appendix B
Letter from Frank Barnett at Anderson Lithograph to IRTA

Anderson Lithograph
3217 S. Garfield Avenue, Commerce, CA 90040-3219

A Mail-Well Company

January 13, 2004

Ms. Katy Wolf, Ph.D.
Institute for Research & Technical Assistance
2800 Olympic Blvd.
Suite 101
Santa Monica, CA 90404

Subject: SCAQMD Alternative Solvent Technology Assessment
Soya Base Roller & Blanket Wash Solvent Formulation
Extended Filed Test: Sheetfed Press, Ultra Violet Ink

Dear Ms. Wolf:

As a member of the Technical Advisory Group for the South Coast AQMD Technology Assessment of Alternative Clean-Up Solvents under Graphic Arts Rule 1171; Anderson Lithograph committed its management, financial and manufacturing resources to SCAQMD and the other participating members of the Technical Advisory Group for the conduct of field performance evaluations of alternative roller and blanket wash formulations developed as part of this technology assessment. Since last September, in a joint effort with your organization, IRTA, and PIA, we have performed a multitude of preliminary, or "bench", evaluation tests and a number of short-term on-press performance tests of alternative formulations developed by your organization. The short-term on-press performance testing was conducted on both web heatset and sheetfed offset lithographic press lines, and on both ultra This testing was performed The results of those tests violet and conventional sheetfed ink formulations.

Based on the results of this initial battery of testing, the roller and blanket wash formulations that exhibited the best on-press performance were further reviewed and one roller and blanket wash formulation was selected to be utilized as a basis for an "extended" on-press performance evaluation test. Since the web press lines at Anderson are equipped with integrated automatic blanket wash systems of a design that precludes making temporary piping modifications to facilitate a single unit alternative wash test, and the physical configuration of the press unit guards are such the manual, or "hand-wipe", washing of blankets with rag applied solvent presents a safety hazard; it was agreed that the extended on-press testing would be conducted on sheetfed offset lithographic press lines running both conventional and ultra violet ink formulations.

IRTA supplied to Anderson Lithograph two sets of five gallon pails of the selected roller and blanket wash alternative formulations for testing, one set each for conventional and ultra violet based ink formulations.. To-date, Anderson has been able to facilitate the on-press of the formulations on a press running ultra violet ink formulations. Production schedules have constrained Anderson's ability to run the test on conventional inks formulations. It is projected that the conventional ink formulation testing will be conducted in February, 2004 during the Annual Report production season. The sections that follow provide a summary of the test criteria and results obtained.

A. Roller Wash Extended On-Press - Test No. 1:

Solvent Formulation:	100% Soy Gold 2000
Formulator:	IRTA (Katy Wolf, Ph. D.)
Test Time Frame:	11/10/2003 to 12/19/2003, six weeks
Press Equipment:	Press HCD-6: Heidelberg, Model CD-108, 8 Unit, Coating Tower UV and IR Curing Stations
Test Unit:	Printing Unit No. 3 - "RED" Unit
Impression Count:	Start: 8,550,000 End: 10,250,000
Ink Rollers:	Rotodyne, "HE" Series ultra violet/conventional combination
Roller Durometer:	Start: 24, End: 29
Printing Inks:	Ink Systems Inc. "H" Series Ultra Violet

Description of Test:

Test was performed on only one (1) printing unit, Unit No. 3, in normal rotation the "RED" printing unit. All othewr printing units on the press were cleaned utilizing standard solvents and cleaning procedures. The test solvent was applied via a solvent "squirt bottle", applying approximately three to four ounces per application, directly to the top roller of ink roller train, with the roller train operating in normal wash-up mode and speed. Waited approximately one minute for solvent to be distributed through to bottom of roller train, then applied blade and another application of solvent. Waited one minute and applied a third application of solvent, and then a fourth waiting the same time period between applications.

The solvent application was followed by four (4) applications of R/O water (demineralized), each consisting of approximately three to five ounces applied via a solvent squirt bottle. Rollers were let run until their surface was nearly dry before another application of rinse water was applied. With the final application of rinse water the rollers were run until their surface was basically dry. This completed the roller cleaning procedure utilized during the testing. Other than the solvent utilized, this procedure is consistent with the standard procedure utilized to clean rollers with conventional petroleum (aliphatic or aromatic) based roller wash formulations. The test was continued until the supplied quantity (5 gallons) of roller wash was expended. This took approximately six calendar weeks to expend the supply of solvent.

Other Factors:

During the test period four (4) color change washes were accomplished on the test print unit. The ink color was changed from the standard rotation "RED" to a PMS White, PMS Grey and PMS Metallic Silver. After completion of the form requiring the PMS, the unit was colored washed again and the standard process "RED" ink placed into the print unit again.

A. Roller Wash Extended On-Press - Test No. 1: (cont'd)

Results of Test:

Test solvent was found to clean the complete roller train to an acceptable level without any significant change in procedures and/or time required. It found that the solvent left "no" appreciable amount of residual deposits and/or contaminants in the pores/structure of the material comprising the "rubber" component of the rollers. This was supported by the fact that no contaminants were experienced when performing roller color change wash-ups, going from the standard process "RED" to the PMS's white, silver and grey, all of which would have be shown "tinting" impacts of contaminants of a red hue if contaminants did exist in the roller train.

In general, press crew personnel said that they did not experience any noticeable negative effects of the solvent on printability of the print unit in which the test solvent was utilized. Specifically, no staining, ink take-up and/or roller train ink distribution problems were encountered during the course of the test. Roller durometer on the selected roller was measured at 29 at the end of the test, increasing five (5) units from the value of 24 measured at the start of the test. This is the same gain experienced on the ink train rollers of other print units on the same press over the same time frame where conventional solvent formulations were utilized to clean the rollers. After each roller wash-up, normal ink take-up and distribution through the train to the plate and ultimately the blanket, was normally achieved in twenty to thirty sheets. This is within parameters experienced with petroleum based roller wash formulations.

Conclusions:

Based on the results of this limited on-press testing, this solvent formulation is believed to be a viable alternative to existing petroleum based solvent formulations. However, longer term material compatibility testing must be performed to determine if there is any negative impact on the roller compound material and therefore acceptable printing operation tolerances over a more sustained term before this formulation can be termed a viable formulation and released into a normal production environment, and certainty before any changes in "BACT" can be based on this formulation chemistry. Material compatibility must also be verified to manufacturer specifications for automatic solvent dispensing systems that are supplied both as OEM and after market retro-fit equipment.

B. Blanket Wash Extended On-Press - Test No. 1:

Solvent Formulation:	50% Soy Gold 2000, 50% acetone
Formulator:	IRTA (Katy Wolf, Ph. D.)
Test Time Frame:	11/10/2003 to 12/19/2003, six weeks
Press Equipment:	Press HCD-6: Heidelberg, Model CD-108, 8 Unit, Coating Tower UV and IR Curing Stations
Test Unit:	Printing Unit No. 3 - "RED" Unit
Impression Count:	Start: 9,XXX,XXX, End: 10,971,800
Press Blankets:	Day International, Series 3000, compressible (0.075")
Printing Inks:	Ink Systems Inc. "H" Series Ultra Violet

Description of Test:

Print Unit No. 3, normal "RED" process color unit, was utilized for the test. The Heidelberg automatic blanket wash system was turned "OFF" on this print unit. The automatic brush scrubber system could not be utilized for the test for several reasons. The first being potential material compatibility problems. Additionally, there were questions concerning the effective flash point of the test formulation and potential fire hazards within the automatic blanket system solvent storage and piping delivery sub-systems. All blanket cleaning was performed manually, utilizing pre-folded cotton rags with the test solvent mixture applied to the rag. The unit blanket was then cleaned with the solvent mixture by manually "wiping" the solvent mixture laden rag across the surface of the blanket.

It was found that some amount of R/O water needed to be applied to the blanket cleaning rag along with the solvent mixture to facilitate in the removal of paper fiber and coating deposits present on the blanket. In summary, the blankets were washed utilizing the same standard procedure as would have been utilized with standard petroleum based blanket wash solvent formulations in a manual cleaning mode.

Results of Test:

The test solvent formulation was very comparable to standard petroleum based formulations in terms of cleaning capability. Only on occasion did the press crews express any concern over apparent early "flash-off" of the acetone portion of the formulation resulting a longer time frame top remove the residual soy portion of the formulation from the blanket surface. It was found that the test mixture had a tendency to somewhat separate if it set for any extended period of time, resulting in the acetone rising to the top. Hence, crews would some times get a higher concentration of the acetone portion of the mixture on their cleaning rag causing inconsistent cleaning characteristics of the solvent.

Results of Test (cont'd): Aside from this minor issue, the test solvent performed within acceptable parameters in its ability to clean the ink from the surface of the blanket in a time frame and expended amount of effort that is comparable to that experienced with manual blanket washing operations utilizing standard petroleum based blanket wash formulations. The crews experienced no significant negative impact on press printability when utilizing this alternative solvent formulation. Ink lay-down consistency was "nominal" as was the amount of dot gain experienced after a blanket wash-up when compared to the other print units of the press after they had been cleaned utilizing the automatic blanket wash system and standard petroleum based solvent formulation.

Conclusions: Based on the results of this limited on-press testing, this solvent formulation is believed to be a viable alternative to existing formulations. However, there are concerns relative to long-term material compatibility in regard to both consumables and equipment, and the flammable characteristics of the formulation. Utilizing this formulation in the present Heidelberg automatic blanket wash system may present problems in both areas noted. These concerns will have to addressed before this formulation and/or derivations of it can be considered as presenting viable options for daily production operations. Utilizing this formulation on a web offset heatset press could pose even more concerns with regard to the flammable nature of the formulation and the "lower explosive limits" of the hot air dryer.

In summary, both the roller and blanket wash formulations tested performed within acceptable operating parameters for wash-up solvents. Neither formulation exhibited any appreciable negative impact on the productivity, efficiency, consistency or level of quality of the printing operations in which their were utilized. Given that the material compatibility and flammability issues can be effectively resolved, and the unit price and availability do not pose any major issue, these alternative formulations are viable substitutes for existing conventional petroleum based solvents. If you have any questions regarding the information presented in this report, please call me.

Sincerely,

Frank C. Barnett
Director, Environmental, Health & Safety

Cc: Anderson Lithograph: E. Binder, J. Worthing, C. Lucas, D. Ibarra
PIA/GATF: G. Bonetto, Director Governmental Affairs