

**MEMORANDUM**

**DATE: November 13, 2009**

**TO: Laboratory Group A**

**Mac Stout, Stephen Grobstein, Harley Hoskins**

**FROM: Tony Butterfield**

**Engineering Training Supervisor**

**SUBJECT: Polyethylene Recycling**

Polyethylene plastics are ubiquitous in modern life and modern landfills. Our client is interested in entering the business of recycling this material, and you are to conduct some preliminary research for them.

Your first task is to use our extruder to create ribbon from the polyethylene pellets in our lab. In your report, please describe the operating conditions for the extruder and roller you use. It may take some tuning to get the rollers to uptake the hot ribbon at the correct speed and you must take special care to not break the extruder’s sheer pin (doing so will set you back a day or more). Keep in mind that you will be recycling this ribbon and so the thickness must be amenable to shredding.

Your second task is to analyze the effect of adding recycled polyethylene to the original pellets. Use around 25% recycled material, and we can discuss how you will shred your material at our preliminary lab meeting. If you have time, it would be useful information to determine the effect of recycling the material multiple times.

You may quantify the mechanical properties of your samples using the taber tester. Our client is also interested to know if any chemical degradation may be detected. Our new FTIR will be useful for this task. Be aware that Group E will also be using the FTIR for part of their project, but their work should take no more than a day. Schedule with them so that you may do taber experiments on the day they are using the FTIR. Please report if you find (or do not find) any statistically significant difference between control and recycled samples, and discuss the theory behind your results.

Best of luck and I look forward to meeting with you regarding this project on or before Wednesday, November 18, 2009.