



STAFF REPORT

To: SBWMA Board Members
From: Hilary Gans, Senior Contracts & Operations Manager
Date: February 28, 2019 Board of Directors Meeting
Subject: Presentation on MRF Processing Equipment Upgrades

Recommendation:

This staff report is for discussion purposes only and no formal action is requested of the Board of Directors.

Summary

In the wake of the commodity market challenges and the need to improve fiber commodity quality to ensure market outlets, SBWMA and SBR staff have analyzed many options to improve material quality. Automation of MRF sorting has emerged as a key strategy towards this goal. The Bond Refunding process provides a unique window to access capital for these future capital projects.

MRF Phase I - Sort System Upgrade

Cost: \$7.3M (firm quote)

Equip. Useful Life: 12 Years; **ROI Payback:** 7.6-year payback (see attachment A)

Net Agency Benefit: 4.4 years

Designs have been completed and a quote for Phase I MRF Upgrade has been obtained from BHS. The Phase I Upgrades includes three projects with financial, commodity market, and operational enhancements that benefits the agency for the next decade. Phase I Upgrades are designed to be installed prior to Phase II so that the improvements in commodity quality can be assessed in the final design of Phase II Upgrades.

1. **Optical Sort of Small Fiber (\$4.2M)**

Description – BHS optical sort systems are used at Shoreway for high-speed separation of containers. This same optical sorting technology will be applied to sorting contamination out of mixed paper to capture more commodity revenues.

Benefits – Optical sorting will capture cardboard and containers that can be sold at a \$1.3M/year in additional revenues (these materials are currently lost to mixed paper), 2) mixed paper will be cleaned up to High-Grade paper that sells at a \$70 per ton premium (see **attachment B**).

2. **Robotic Sorting of Residue/QC System (\$1.6M)**

Description - BHS manufactures a robotic sorting system (Max-AI AQC) that utilize advanced recognition and AI technology to identify and sort a wide variety of materials. Applying this robotic system to the MRF residue will result in a reduction in sort labor expense and the capture of more recyclable materials that are currently "lost" to residue/disposal. Additionally, this recognition system will be installed at the end of

all fiber sort lines to identify, record, and report the fiber composition and quality so that the Phase II optical sort system will meet the fiber commodity quality standard for high grade paper.

Benefits - Robotic sort and quality control system benefits include: 1) reduced sorting expense of \$204K/year, increase capture of recyclables currently lost to residue, 3) data collection for used in design of Phase II fiber sort, and 4) ability to issue fiber-quality reports to buyers.

3. **Enhanced Glass Cleanup System (\$684,158)**

Description - The MRF glass commodity is created by breaking all the glass fed into the sorting system and then sifting fine material/glass out of the stream of recyclables. Currently this glass mix is contaminated with shredded paper, batteries, and small metals and plastic contaminates. The glass clean-up system will remove contaminates through a combination of magnets, screening and air. A key aspect of the project is to remove batteries and to reduce exposure to fires caused by batteries.

Benefits – 1) Reduced fire risk by removing batteries early in the sort line, 2) improved glass commodity sale price of \$4/ton, 3) other commodity revenue from metals and CRV recovery, 4) operational improvement from removal of shredded paper that is plugging the system causing plant stoppages.

MRF Phase II – Sort System Upgrades

Cost: \$8.2 M (firm quote)

Equip. Useful Life: 12 Years; **ROI Payback:** 5-year payback (see attachment A)

Net Benefit: 7 years

Description: In response to the China mixed paper import ban, the recycling industry is transitioning to highspeed optical sorting technology to remove contamination and meet new paper quality standards. Six-optical sorters will be installed in place of sort labor to upgrade mixed paper to High-Grade paper and recover additional recyclables.

Benefits: 1) High-Grade paper sells at a \$70 per ton premium over mixed paper (see **attachment B** - letters from SBR and Potential Industries) providing the SBWMA \$1.5M/year in additional revenues, 2) commodities currently lost to mixed paper will be sold at a premium, 3) reductions in sort labor will save \$487K/year.

Organics to Energy – Full-Scale Project (\$10M, Cost Neutral)

Description: In November 2018 the Board approved the O2E Pilot project and recommended funding the Full Scale O2E Project after proof-of-concept is achieved. Equipment design and layout has confirmed the cost of the project at ~\$10M. Board consideration of the O2E Full Scales is anticipated in 2021.

Benefits: 1) 25-30% reduction in waste to landfill, 2) significant GHG emissions reduction, 3) reduced commercial collection organics costs (estimated at over \$2M per year).

Attachments:

Attachment A: MRF Processing Equipment Upgrades Financials

Attachment B: Letters from SBR and Potential in support of MRF Upgrades to improve commodity revenues

Attachment A - MRF Processing Equipment Upgrades Financials

MRF Phase I Equipment Upgrade Project

Project Summary

Capital Expense			
Enchanced Glass Cleanup System	\$	684,158	
Max-AI Robotic Recovery	\$	1,635,000	
Third-Sort Optical	\$	4,548,094	
Package Discount	\$	(203,667)	
Subtotal	\$	6,663,585	
Project Contingency	\$	666,359	10.0%
Total Capital	\$	7,329,944	

Annual Financial Benefit			
1. Enchanced Glass Cleanup System	\$	67,883	\$ 39,313
2. Max-AI Robotic Recovery	\$	204,637	\$ 136,361
3. Third-Sort Optical	\$	978,982	\$ 789,056
Package Discount			\$ -
Subtotal			\$ 964,730

		<i>b</i>	<i>c</i>
		Interest	Net Benefit
	\$	(28,570)	\$ 39,313
	\$	(68,276)	\$ 136,361
	\$	(189,925)	\$ 789,056
	\$	(286,772)	\$ 964,730

<i>Interest Expense is 10 Year Average</i>			
Payback (Years)	5.86		7.60
ROI	17.1%		13.2%
Interest Rate on Bonds	4.5%		

MRF Phase II Equipment Upgrade Project

Project Summary

Capital Expense	
CAPITAL	\$ 7,500,000
Contingency	\$ 750,000 10%
TOTAL CAPITAL	\$ 8,250,000

Annual Financial Benefit	
	<i>a</i>
	<i>b</i>
	<i>c</i>
	Net Financial Benefit

Net Incremental Revenue	\$ 1,494,260	\$ 1,494,260
Net Labor Savings	\$ 487,084	\$ 487,084
Interest (10 Yr Avg.)		\$ (322,767)
TOTAL SAVINGS	\$ 1,981,344	\$ 1,658,576

Payback	4.2
ROI	24.0%
Interest Rate on Debt	4.5%
	5.0
	20.1%

*includes Revenue Share
excludes depreciation*

Attachment B – Letters from SBR & Potential Industries



**Potential
Industries Inc**

720 East "E" Street
Wilmington, CA 90744
(310) 549-5901

February 13, 2019

SBWMA, RethinkWaste
Facility Operations Contracts Manager
Mr. Hilary Gans
610 Elm Street, Suite #202
San Carlos, CA 94070

Re: High Grade Paper (HGP) sorted from MRFs

Dear Mr. Gans,

As you know, Potential Industries, Inc. (PII) has been exporting recovered paper for over 40 years. In addition to our own MRF sorted paper, we also market sorted paper from over 20 MRFs throughout the USA.

Based on our many years' experience, and using our best professional judgment regarding paper sorted from single stream MRFs: (a) we have serious concerns about the long term viability of traditional mixed paper, and (b) we believe High Grade Paper will continue to not only be in demand, but also the price for it will be significantly higher than traditional mixed paper.

In 2018 the price of High Grade Paper was approximately \$75 per ton higher than traditional mixed paper, and in our opinion that premium is likely to continue. Although nobody in the industry can accurately predict future pricing, we strongly encourage MRFs to upgrade their mixed paper to High Grade Paper because this grade will continue to be consumed by many paper mills.

Best Regards,

A handwritten signature in blue ink that reads "Daniel J. Domonoske". The signature is fluid and cursive.

Daniel J. Domonoske
Executive Vice President

February 12, 2019

SBWMA, RethinkWaste
Facility Operations Contracts Manager
Mr. Hilary Gans
610 Elm Street, Suite #202
San Carlos, CA 94070

Re: Fiber Market Explanation and Price Comparison

Dear Mr. Gans,

Recovered paper and cardboard, also known as fiber, represents approximately 50% of the commingled materials sorted in the MRF. SBR has some of the best fiber export marketing capabilities in the recycling industry, which remains dependent on export due to lack of domestic demand. As you know, end user mills throughout SE Asia have tightened up their quality requirements, and MRFs throughout CA are responding by making higher quality products.

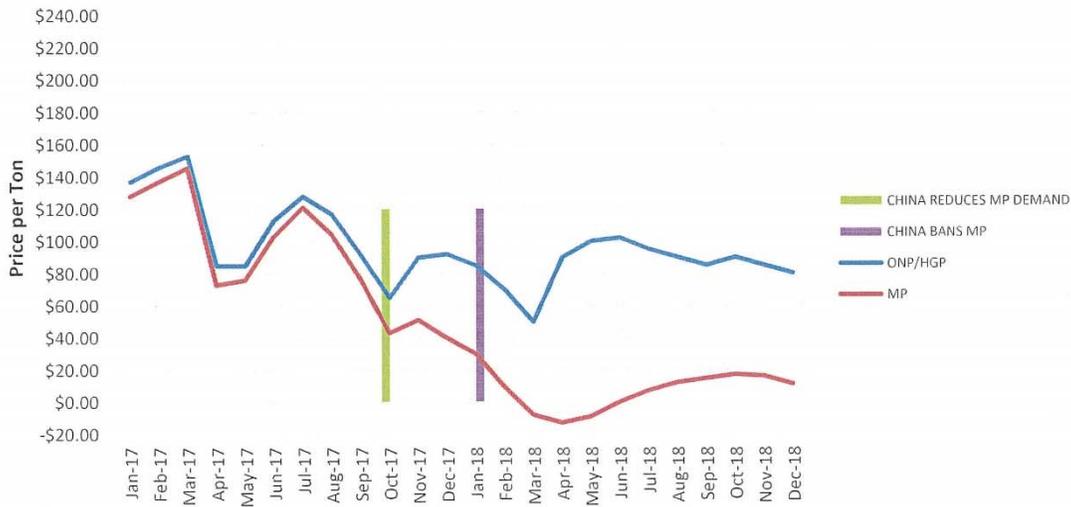
In 2018 China, then the largest end user of mixed paper in the world, banned the import of mixed paper. Although there are a few other markets in SE Asia for mixed paper, the price is very low. To make matters worse, there is trend in SE Asia for other countries to also ban mixed paper. By reducing the quantity of mixed paper being generated SBWMA has the opportunity to reduce their risk of having a sorted product without a market, either domestic or export. In addition, by creating a higher quality paper it can be sold at better pricing than Mixed Paper.

Graph #1 below shows the monthly price for High Grade Paper (formerly known as Old News Paper) compared to Mixed Paper. In 2017 those prices were quite close to each other. However, in Q4 2017 when it became clear that China would indeed ban Mixed Paper the gap between High Grade Paper and Mix Paper grew. The effective date of the ban was based on cargo arrival in China, as such the price gap accelerated in November and December 2017.

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Graph #1

2017-2018 Price Comparison Old News Paper/High Grade Paper (ONP/HGP) v Mix Paper (MP)



In 2018 several haulers and MRFs were forced to send Mixed Paper to landfills. This was done either by stockpiling bales in hopes of a market resurgence only to find there was none, or no longer sorting it from the commingled stream and simply letting it go to residue without being sorted and baled in the MRF. In either case the outcome had negative impacts on diversion levels and public perception of recycling.

Today there is a unique opportunity available to SBWMA which is created by customer demand, technology developments for MRF processing equipment, and bond refinancing. These events provide SBWMA with a decision to make regarding the MRF: shall we invest in the future of our MRF?

In our professional opinion, by investing in the proposed MRF equipment upgrades there will be two changes to the fiber commodities: (1) less Mixed Paper being produced, and (2) more sorted fiber products being sold at higher pricing. These changes will increase the monthly revenues and also increase the number of end users that are interested in our fiber products.

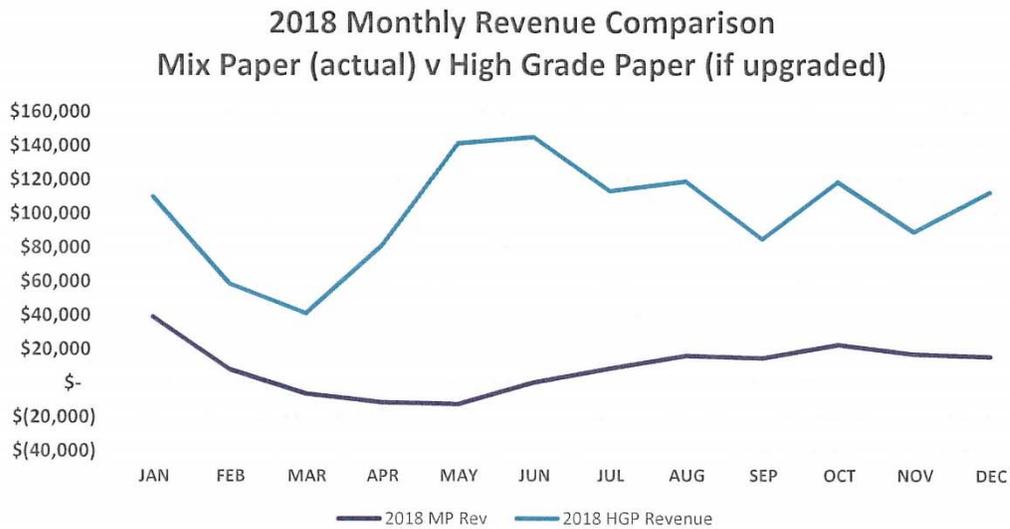
The initial economic benefit is producing a higher quality paper grade from the commingled materials which are collected in single family residential collection routes. That paper is mechanically screened on the residential sort line to create paper which is currently sold as Mixed Paper (a low value commodity). In addition to removing most of the cardboard, the proposed system will also remove contamination and

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containers from the Mixed Paper. As a result that paper will be higher quality and will be sold as High Grade Paper, at a premium price above Mixed Paper.

Graph #2 below shows the actual monthly revenue in 2018 for the paper which was sold as Mixed Paper (MP) compared to the monthly revenue for that same material if it was sold as High Grade Paper (HGP). The cumulative incremental economic benefit from selling those tons as HGP amounts to over \$1,100,000 in 2018, and that would have been achieved had the new equipment upgrade been installed and operational.

Graph #2



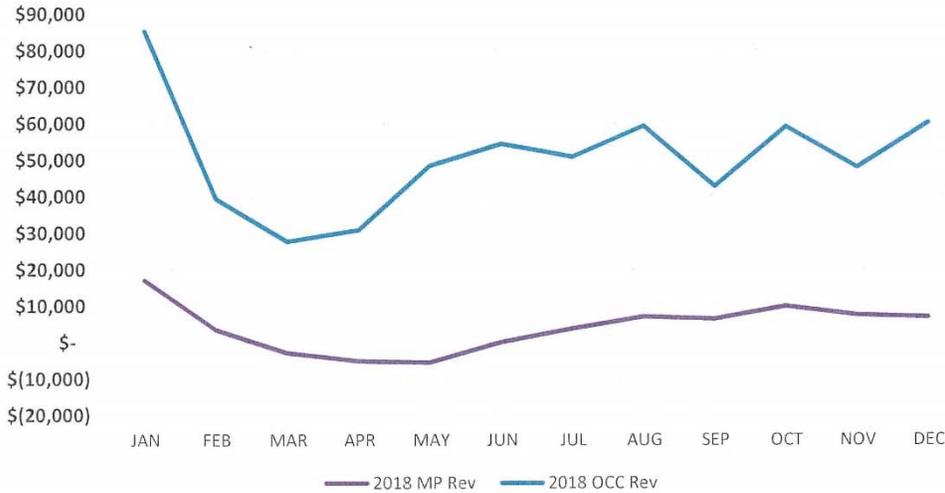
The other economic benefit from the proposed upgrade is increasing the amount of cardboard (aka Old Corrugated Containers, or OCC) being produced. Over the past 10 years there has been an increase in online shopping which results in households generating more cardboard, and those cardboard pieces are smaller in size and lighter in weight. As such a lot of that cardboard currently ends up in Mixed Paper. The proposed system will remove most of it from the Mix Paper (a low value commodity) and recover it as OCC cardboard (a higher value commodity).

Graph #3 below shows the actual monthly revenue in 2018 for the paper which was sold as Mixed Paper compared to the monthly revenue for that same material if it was sold as Old Corrugated Containers (OCC). The cumulative incremental economic benefit from selling those tons as OCC amounts to over \$500,000 in 2018, and that would have been achieved had the new equipment upgrade been installed and operational.

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Graph #3

2018 Monthly Revenue Comparison
 Mix Paper (actual) v. Cardboard (OCC (if upgrade))



In addition to the economic benefits listed above, there will be significantly less paper being sold as Mixed Paper. This is important because the uncertain future demand for Mixed Paper causes many in the industry to wonder how long it will remain a viable product.

SBWMA is working with two of the best partners in the industry, SBR (facility operations) and BHS (equipment supplier), and together the team can implement the proposed projects to create value that provides long term economic and environmental benefits to Member Agencies.

Future recycling commodity market pricing and quality requirements cannot be precisely defined. However, there is a consensus within the industry that the facilities which are sustainable will be those that are capable of doing two things: (1) producing grades that are in demand, and (2) producing qualities that are better than the prevailing industry average.

Best Regards,

Daniel J. Domonoske
 Vice President

CC: Dwight Herring, GM

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