



## **ReVision Consultants**

*Sustainable Rendering and Power Production*

*It Takes Guts To Go Green*

**Stacey Glenewinkel: Sustainability and PR Expert**

**Craig Briggs: Environmental Policy Analyst**

**Mack Malloch: Environmental Engineer**

**Andrew Ryan: Green Products Expert**

**Drew Hambleton: Toxicologist**

## **Introduction**

BJ's Chop-It-Up currently provides essential rendering services to the city of Meatfall and surrounding communities. Unfortunately the company is struggling to maintain its positive community image within the growing town due to the ever encroaching residential neighborhoods and the complaints that people have brought forth.

ReVision Consultants has developed a multi-faceted proposal that will achieve three important and exciting goals: 99% odor elimination, dramatically increased revenue and sustainability for a secure future. We have identified several minor sources of odor at the facility and developed simple, economical solutions to these minor sources. We have also identified two major sources of odor and have developed a unique, innovative yet time-tested solution to these challenges.

Craig Briggs, an Environmental Policy Analyst, will be talking about the environmental targets we want to achieve as well as identifying the most immediate changes to the facility required for legal compliance. Mack Malloch an Environmental Engineer, will be discussing the major sources of odor and will introduce our innovative and exciting idea to eliminate odor while increasing revenue and becoming an icon of sustainability in the community. Andrew Ryan, our Green Products Expert, will discuss the new green products BJ will produce and information about grants that are available to off-set the initial investment. Stacey Glenewinkel, our Sustainability and PR Expert, will be discussing the future of BJ's and the benefits to the community, environment and BJ's public image, that will result from choosing our proposed alternative. Drew Hambleton our Risk Assessor will close the presentation by summarizing the achieved goals and benefits of our alternative.

## **Sources of Minor Odor & Basic Remedies**

The most important environmental goals for BJ to achieve are to adhere to the federal, state, and local regulations for noxious odor emissions. These regulations include the Clean Air Act sections 7401-7671q as well as IDAPA 58.01.01.776.02 and 58.01.835 thru 839. The consequences for not complying include criminal liability which could result in fines not to exceed \$5000 for each violation. Consistent odor complaints could require the Department of Environmental Quality (DEQ) to assess whether these are separate complaints based on applicable timing, source response, stage of implementation of the Odor Management Plan (OMP), and any other relevant factors.

We have identified the minor sources of odor to be the following: 1) decaying raw input waiting to be processed 2) a cracked concrete pad allowing bacteria and contaminants to persist and 3) stagnant wastewater from cleaning the concrete pad. For each of these sources of odor there are existing best management practices (BMP) available. Limiting the amount of time a carcass waits at the facility before rendering reduces the level of ammonia and nitrogen it produces. By rendering immediately the more preferable organic nitrogen compounds are present which can be removed from the indelible wastewater runoff. By allowing trucks to wait in line at his facility BJ is liable for the odor they produce. We recommend that BJ require a drop-off appointment to avoid truck wait times and associated odor. Sealing the concrete pad and installing a drain ensures collection of all wastewater. These measures will significantly reduce the odor from the facility.

According to the Idaho Administrative Code Section 30, Disposal of Dead Animals, rendering facilities are also required to be screened from public view. Covering the receiving area with a metal framed structure and planting native vegetation on the perimeter to hide the material from public view is necessary to avoid a fine for being a "nuisance".

## **Sources of Major Odor & Remedies**

Major sources of odor in the rendering process are the moisture and volatile organic compounds (VOC) coming off of the boiler, cooker and the wastewater that is currently not being treated. To treat this odor a 95% Regenerative Thermal Oxidizer (RTO) will be installed in line after the existing wet scrubber. This will manage the VOC/odor not removed by the wet scrubber. Wet scrubbers remove 95% SO<sub>2</sub> and 70%-90% VOC leaving the remaining untreated<sup>1</sup>. With the addition of a RTO 99% of the remaining effluent VOC will be removed.

An RTO with the capacity to oxidize the air from a 12,000 scfm building at 14,000-16,000°F for 0.03sec, will require 0.8 MMBtu/hr. Doubling the size of the building increases the fuel required to 1.5MMBtu/Hr. This fuel will be supplied by the installation of an anaerobic digestion system at the plant.

In addition we propose the installation of an anaerobic digester with the capacity to treat the waste water and solids produced in the area estimated to be 650,000 ft<sup>3</sup>. A similar case study using a digester of 162,361 ft<sup>3</sup> had capacity to digest 144,000 ft<sup>3</sup> of animal waste<sup>2</sup>. The retention time for this case study digester was 22days. Retention time for the proposed digester would be

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<sup>1</sup> EPA Design Manual

<sup>2</sup> AD Vander Haak Factsheet, WSU Department of Agriculture

substantially shorter due to the high fatty acid content of the substrate. The case study digester produced 1.32tons/day of 60% methane. A similar case study done by AC Biotechnics Inc. using indelible material from a rendering plant produced biogas that was 85% methane. Using the standard production rates of this data, we expect approximately 235,921ft<sup>3</sup>.of methane at 85% producing 334,220,977 Btu/day. After supplying energy to the RTO, 13,125,874Btu/hr remain for other facility operations. This energy can be used to run the plant boiler and an electrical generator.

In addition, to reduce odor output, a second wet scrubber may be installed in succession with the current scrubber. This provides the opportunity to specialize each scrubber to a particular odor set and allowing for control of more odorous compounds. As a precautionary measure, ducting should be installed to route odorous air from the RTO to the boiler in the event that the RTO should fail.

### **Considering Tomorrow**

Both BJ's Chop-It-Up and the community will realize significant benefits from construction of an anaerobic digester. 100% of the wastewater from the rendering process will be treated on-site. This will lead to a reduction in both air and water pollution for the community. 99% of the odor from the facility will be extinguished, making the town of Meatfall an appealing place to live, work and play once again. Untreated water that once flowed into creeks and waterways will now be captured and recycled on-site. By using recycled water the demand on the municipal water supply will be reduced, making more water available for the community which will be a positive contribution to the town.

An anaerobic digester's main product is biogas, a mixture of methane and carbon dioxide. Methane can be harnessed for use in several processes within BJ's rendering plant including providing the fuel for the RTO and a new or retrofitted natural gas boiler, providing significant annual savings in fuel costs. Remaining biogas will be combusted in a generator for the production of electricity, powering the plant, and feeding power back into the electrical grid.

By collecting and adding the manure from the surrounding pig and chicken farms to the digester, these farmers will economically reduce their impact on odor in Meatfall and avoid the same enforcement actions by the environmental authorities that BJ has experienced. BJ will obtain a necessary component to the anaerobic digestion process.

More than 30% of the residential waste that ends up in the county landfill is food scraps and food-soiled paper. Recycling food scraps and food-soiled paper saves landfill costs and helps postpone the need for more landfill space. By constructing a small collection area at the entrance to the property, BJ can offer Meatfall residents a free community food recycling drop off location. Currently residents are charged a fee to participate in the city food recycling program. BJ's free service will be appealing to residents.

Finally sustainability is the buzz word of the new millennium. Smart businesses are going green in order to keep up with changing expectations from customers and the community. BJ has a unique opportunity to be viewed as a progressive, green company by implementing our proposed alternative. 99% odor elimination, 100% on-site wastewater treatment, renewable energy production and utilization, community involvement and the production of green products all demonstrate that BJ's Chop-It-Up is a company that cares about a triple bottom line; economic, environmental and social.

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### **Conclusion**

Our proposal will eliminate 99% of the odor problems coming from the facility while earning an extra \$87,000 from the sale of electricity and saving \$800,000 a year in fuel costs. With our proposed alternative BJ's Chop-It-Up can become more than a successful rendering plant. The company can become an icon of sustainability in the rendering industry while securing the future of the operation against further environmental regulation penalties and protecting the environment for all the citizens of Meatfall. The stakeholders and the community will recognize the benefits of our proposed plan and will support BJ's effort to remedy the environmental problems. The plant will continue to provide an important community service while building stronger relationships with neighbors and earning higher revenues with our proposal.