
SAN JUAN BIOCHAR PROJECT
2010

TRI-BAR, INC
P.O. BOX 2155
PAGOSA SPRINGS, CO 61147
970 731 1718
970 903 1250
GLENN ROBINSON
GENERAL MANAGER

SAN JUAN BIOCHAR PROJECT

2010

OVERVIEW

In May 2010 Tri-Bar , Inc. of Pagosa Springs. Colorado, thru it's General Manager, Glenn Robinson, was contacted by Gretchen Fitzgerald, San Juan National Forest.

Having worked with Mr. Robinson on prior projects, Ms Fitzgerald inquired as to possible interest in an experimental effort into the production of BioChar. The scope of the project is in Exhibit "A" of this report.

Being new to this concept, Tri-Bar embarked upon research and investigation into the various methods and details of this venture. After extensive research and consideration , Tri-Bar Inc. submitted a competitive bid and was subsequently awarded a contract for the production of 128 cubic feet of BioChar.

After numerous contacts with producers of BioChar, including Peter Hirst, of New England BioChar, it was decided to use a series of "Double Barrel Retorts" to produce the product. See (Exhibit "B")

DOUBLE BARREL RETORT

After preliminary research and development a typical retort system consist or the following:

- 1) 30 gallon barrel, with the top removed. This barrel is filled with FEED STOCK material, and slid with open top down, into a 55 gallon barrel.
- 2.) 55 gallon barrel, with top removed or with detachable lid. Half inch holes were drilled 6 to 8 inches apart approximately 6 inches from top and bottom of barrel to allow gases to escape. This barrel was wrapped with 2300 degree ceramic fiber cloth (1" thick X24" wide) centered on exterior of barrel. 29 gage sheet metal was pop riveted to cover and secure ceramic fiber cloth.
- 3.) Barrel lid and smokestack: The preferred lid for the 55 gallon barrel, was the removable type with a separate securing ring that can be tightened. A 8" diameter hole was cut into the center of the lid. A 36" high section of metalbestos stove pipe (6" ID 8" OD) was used for the draft -smoke stack.)

SAN JUAN BIOCHAR PROJECT

2010

PRODUCTION EFFORTS

It was decided to use various species of wood products from San Juan National Forest for the feed stock (material to be converted to BioChar.) The wood species consisted of Douglas fir, Ponderosa pine, Colorado Blue spruce and Cottonwood.

Various sizes of feed stock were tried, such as chips, 2"X4" size stock and 2"X2"X26" size stock. All sizes were acceptable with the 2"X2"X26" size preferred. The feed stock was packed into the smaller barrel.

After loading the feed stock into the 30 gallon barrel, and inserting open side down, into the 55 gallon barrel; initial burn material was placed. A 2"/ 3" space remained between the two barrels. Small tinder material such as 1" X 1" X 30" kindling was packed around the space along with pine needles, cones and scrap wood on the top of the small barrel. This material was lit and allowed to burn for 10 to 15 minutes. Upon full ignition of the top layer of the initial burn material, the lid and smoke stack were set into place.

The process of *pyrolysis* then commenced, and continued for approximately 3 ½ hours. The process allowed the feed stock to burn in an oxygen deprived environment.

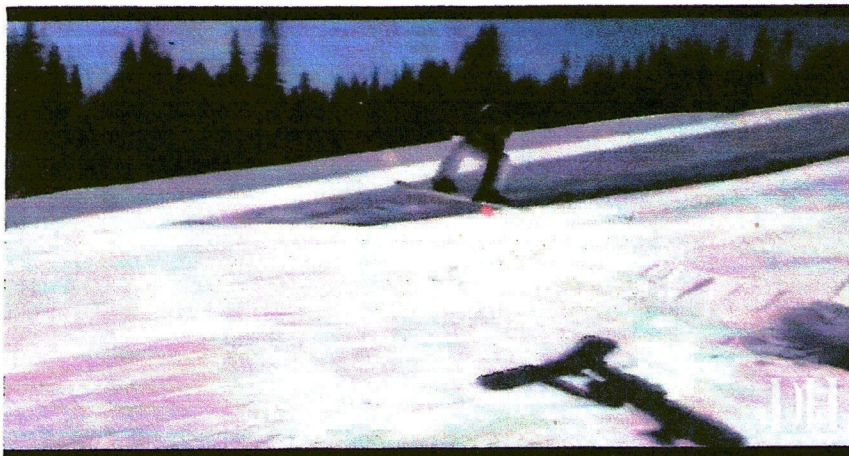
The processed feed stock, now BioChar, can be cooled with water or in this case allowed to cool naturally overnight.

Because of the size requirement under the contract, in Exhibit "A", the BioChar was crushed into the required size. A 4-0 X 8-0 wood box was constructed and used for this purpose.

FINISHED BIOCHAR

After processing to the proper size the BioChar was placed and stored in 55 gallon drums for transportation.

The ultimate use for this BioChar was destined for soil reclamation on the Purgatory Ski area at Durango Mountain Resort. It was applied to a new half pipe snowboarding area.



SAN JUAN BIOCHAR PROJECT

2010

ADDITIONAL NOTES

- 1.) To monitor the temperature, a laser pyrometer was used. This was useful to measure the heat retention of the ceramic fiber cloth, as well as the high temperature of pyrolysis during burning.
- 2.) The yield of feed stock to BioChar was approximately 40 percent by volume in a 30 gallon barrel.
- 3.) pH test were performed by Green Analytical Laboratories in Durango, Co.. See attached Exhibit "C". While the results were somewhat higher than neutral 7.0 ; (9.56 to 10.1) it was agreed suitable for the desired use.
- 4.) Various photos of the BioChar project are attached.







USDA Forest Service
San Juan National Forest
Columbine Ranger District
<http://www.fs.fed.us/r2/sanjuan>

Columbine Public Lands Center
367 Pearl Street
P.O. Box 439
Bayfield, CO 81122
Ph (970) 884-2512 Fax (970) 884-2428



USDI Bureau of Land Management
San Juan Center
Columbine Field Office
<http://www.co.blm.gov/>

Project Title: San Juan Biochar

Requirements Document (RD)

Project Purpose

The purpose of this project is to provide a new opportunity for a business to develop the means to make biochar. Biochar is carbonized organic matter. The production of biochar involves the heating of the biomass in an oxygen low environment, so that the material does not combust. The San Juan Public lands is seeking biochar to use as a soil amendment for the restoration of disturbed sites such as abandoned mine tailings, pipelines, old roads and relocated trail heads. Biochar makes an excellent soil amendment as well as providing an opportunity to sequester carbon for several hundred years.

Business Opportunity

This project may provide a new business opportunity. The San Juan Public Lands office will not retain any rights to specifications, technology, drawings or any other data rights. The idea is to promote a new opportunity for research and development.

Request for Proposal (RFP) for the Production of BioChar

The San Juan Resource Area is requesting proposals for production and delivery of biochar. The material to produce the biochar shall be from the San Juan National Forest and BLM lands managed by the San Juan Public Lands Center. The biochar must be made in such a manner that the gases produced during pyrolysis are re-burned, limiting the emissions of green house gases produced during the production of the char. This can be achieved by using an Adam Retort or other stove. Emissions of gases produced must be within all county and state regulations. Methodology and technologies that are going to be used are at the discretion of the vendor. However, please illustrate the methodology and technology in your solicitation proposal. The biochar can be made at the contractor's site or on the public lands where the slash piles occur.

Required Quantity of BioChar

Two pickup truck loads (8'Wx2'Dx4'L).

Performance Date

Delivery date is on or before August 30, 2010

Delivery must be by truck and shall be deposited into barrels provided by the San Juan Public Lands.

Delivery Location: Trimble work center; approximately seven (7) miles north of Durango off Hwy 550. Work Center address is 373 CR 252, Durango, CO 81301

Specifications

- At least 80% by volume of the biochar must be less than 3"x3"x3" and at least 50% must be no larger than 2"x 1"x1" in size.
- Ash content must be less than 20% by volume
- pH must be between 5.5 and 8.5

Size specifications will be measured by sifting samples through a screen. PH will be measured by soaking biomass in distilled water and using a pH meter.

Passes and Permits

Prior to entering onto public lands for the retrieval of the bio-mass for Biochar production, the vender must obtain passes and permits from either or both the BLM and US Forest Service located at the San Juan Public Lands Center, 15 Burnett Court, Durango, Colorado.

Proposals Shall Include

- Technologies (any designed equipment) used for the production of BioChar
- Past Performance: include in the proposal at least three (3) references pertaining to past performance to include the name of Government Agency or Business, Persons of Contract (POC), address and phone numbers.
- Management and Human Resource skills

Proposal Evaluation

Proposals will be evaluated on the following five factors. All factors will be considered equally:

- Lowest Price Technically Acceptable (Price)
- Strength of proposal which includes:
 1. Technology: resources and technologies available to develop equipment for the production of BioChar.
 2. Past performance
 3. Management and Human Resource skills in the areas of BioChar production

Attachments

Location - Site Map of Biomass areas for the production of BioChar

EXHIBIT "B"

YouTube - MAKING BIOCHAR: with Peter Hirst of New England Biochar

Page 1 of 2

biochar

Search

Browse

Upload

Create Account

Sign In

MAKING BIOCHAR: with Peter Hirst of New England Biochar

georgpactard 9 videos

Subscribe



Green Analytical Laboratories
75 Suttle Street
Durango, CO 81303

EXHIBIT "C"

Glenn Robinson
PO Box 5155
Pagosa Springs, CO 81147
Attention:

GAL I.D.: 1009-015-01

Date Received: 09/01/10

Date Reported: 09/09/10

QC Batches:

PROJECT NAME: Biochar
PROJECT NUMBER:
SAMPLE I.D.: SB #1

Sample Date:
Sample Matrix: Water

Wet Chemistry

RESULTS

PARAMETER	METHOD	REPORT LIMIT	RESULT	UNITS
pH	150.1	NA	9.56	SU on 10:1 Extract

03
Debbie Zufelt, Laboratory Manager

EXHIBIT "C"

Green Analytical Laboratories
75 Suttle Street
Durango, CO 81303

Glenn Robinson
PO Box 5155
Pagosa Springs, CO 81147
Attention:

PROJECT NAME: Biochar
PROJECT NUMBER:
SAMPLE I.D.: VB #1

GAL I.D.: 1009-015-02

Date Received: 09/01/10

Date Reported: 09/09/10

QC Batches:

Sample Date:

Sample Matrix: Water

Wet Chemistry

RESULTS

<u>PARAMETER</u>	<u>METHOD</u>	<u>REPORT LIMIT</u>	<u>RESULT</u>	<u>UNITS</u>
pH	150.1	NA	9.69	SU on 10:1 Extract


Debbie Zufelt, Laboratory Manager

EXHIBIT "C"

Green Analytical Laboratories
75 Suttle Street
Durango, CO 81303

Glenn Robinson
PO Box 5155
Pagosa Springs, CO 81147
Attention:

GAL I.D.: 1008-174-01

Date Received: 08/20/10

Date Reported: 08/24/10

QC Batches:

PROJECT NAME:

PROJECT NUMBER:

SAMPLE I.D.: Biochar

Sample Date: 08/20/10

Sample Matrix: Water

Wet Chemistry

RESULTS

PARAMETER	METHOD	REPORT LIMIT	RESULT	UNITS
pH	150.1	NA	10.1	SU on 5:1 Extract

D3
Debbie Jufelt, Laboratory Manager