



**BOARD OF SUPERVISORS AGENDA ITEM REPORT**  
**CONTRACTS / AWARDS / GRANTS**

☐ Award ☒ Contract ☐ Grant

Requested Board Meeting Date: 02/05/19

\* = Mandatory, information must be provided

or Procurement Director Award ☐

**\*Contractor/Vendor Name/Grantor (DBA):**

The Ashton Company, Inc., Contractors and Engineers

**\*Project Title/Description:**

Design-Build Services For TRWRF BioGas Cleaning & Utilization Project (3GAS18)

**\*Purpose:**

Amendment: Contract No. CT-WW-18-423, Amendment No. One (1). This amendment increases the contract amount by \$7,730,608.91 for a cumulative not-to-exceed amount of \$8,394,160.91 and incorporates Guaranteed Maximum Price No. One (GMP-1). Administering Department: Regional Wastewater Reclamation.

GMP-1 pertains to the ordering of long-lead equipment and construction of the electrical infrastructure expansion required for this project. Due to limited subcontracting opportunities, no Small Business Enterprises (SBE) goal is established for GMP-1.

**\*Procurement Method:**

Pursuant to Solicitation for Qualifications No. 285645, on 07/03/18, the Board of Supervisors awarded a contract for design and pre-construction services for this project in the amount of \$663,552.00 for a contract term of 07/03/18 to 12/31/20.

Attachment: Amendment No. One (1).

**\*Program Goals/Predicted Outcomes:**

This program will provide a means of cleaning to "pipeline quality" the biogas created by the anaerobic digestion of the wastewater solids and injecting it into the Southwest Gas system for use as a renewable resource.

**\*Public Benefit:**

This program will create a revenue stream by selling the gas in the marketplace. This program also affirms a commitment to Pima County's philosophy of sustainability by creating Renewable Natural Gas (RNG) for reuse.

**\*Metrics Available to Measure Performance:**

The success of this project will be measured by providing clean biogas that meets Southwest Gas specifications (RNG) and by the return on the capital investment through the revenue generated.

**\*Retroactive:**

No

To: COB - 1-23-19  
pgs - 85  
(11)

CONFIDENTIAL - INTERNAL USE ONLY

**Contract / Award Information**

Document Type: \_\_\_\_\_ Department Code: \_\_\_\_\_ Contract Number (i.e., 15-123): \_\_\_\_\_

Effective Date: \_\_\_\_\_ Termination Date: \_\_\_\_\_ Prior Contract Number (Synergen/CMS): \_\_\_\_\_

☐ Expense Amount: \$\* \_\_\_\_\_ ☐ Revenue Amount: \$ \_\_\_\_\_**\*Funding Source(s) required:**Funding from General Fund? ☐ Yes ☐ No If Yes \$ \_\_\_\_\_ % \_\_\_\_\_Contract is fully or partially funded with Federal Funds? ☐ Yes ☐ No

If Yes, is the Contract to a vendor or subrecipient? \_\_\_\_\_

Were insurance or indemnity clauses modified? ☐ Yes ☐ No

If Yes, attach Risk's approval.

Vendor is using a Social Security Number? ☐ Yes ☐ No

If Yes, attach the required form per Administrative Procedure 22-73.

**Amendment / Revised Award Information**Document Type: CT Department Code: WW Contract Number (i.e., 15-123): 18-423Amendment No.: One (1) AMS Version No.: Four (4)Effective Date: 02/05/19 New Termination Date: \_\_\_\_\_

Prior Contract No. (Synergen/CMS): \_\_\_\_\_

☒ Expense or ☐ Revenue ☒ Increase ☐ Decrease Amount This Amendment: \$ 7,730,608.91Is there revenue included? ☐ Yes ☒ No If Yes \$ \_\_\_\_\_**\*Funding Source(s) required:** Regional Wastewater Reclamation ObligationsFunding from General Fund? ☐ Yes ☒ No If Yes \$ \_\_\_\_\_ % \_\_\_\_\_**Grant/Amendment Information** (for grants acceptance and awards) ☐ Award ☐ Amendment

Document Type: \_\_\_\_\_ Department Code: \_\_\_\_\_ Grant Number (i.e., 15-123): \_\_\_\_\_

Effective Date: \_\_\_\_\_ Termination Date: \_\_\_\_\_ Amendment Number: \_\_\_\_\_

☐ Match Amount: \$ \_\_\_\_\_ ☐ Revenue Amount: \$ \_\_\_\_\_**\*All Funding Source(s) required:****\*Match funding from General Fund?** ☐ Yes ☐ No If Yes \$ \_\_\_\_\_ % \_\_\_\_\_**\*Match funding from other sources?** ☐ Yes ☐ No If Yes \$ \_\_\_\_\_ % \_\_\_\_\_**\*Funding Source:** \_\_\_\_\_**\*If Federal funds are received, is funding coming directly from the Federal government or passed through other organization(s)?** \_\_\_\_\_Contact: Keith E. Rogers Keith E. Rogers 1-16-19Department: Procurement May 16/19 Telephone: 724-3542Department Director Signature/Date: [Signature] 1/17/19Deputy County Administrator Signature/Date: [Signature] 1/22/19County Administrator Signature/Date: [Signature] 1/24/19

(Required for Board Agenda/Addendum Items)

**PIMA COUNTY REGIONAL WASTEWATER  
RECLAMATION DEPARTMENT**

**PROJECT:** Design-Build Services For:  
TRWRF BioGas Cleaning &  
Utilization Project (3GAS18)

**CONTRACTOR:** The Ashton Company, Inc.,  
Contractors and Engineers  
PO Box 26927  
Tucson, AZ 85726

**CONTRACT NO.:** CT-WW-18-423

**AMENDMENT NO.:** One (1)

**FUNDING:** Regional Wastewater Reclamation  
Department Obligations

**CONTRACT**

**NO.** CT-WW-18-423

**AMENDMENT NO.** 01

This number must appear on all  
invoices, correspondence and  
documents pertaining to this  
contract.

**CONTRACT TERM:** 07/03/2018 - 12/31/2020  
**TERMINATION PRIOR AMENDMENT:** NA  
**TERMINATION THIS AMENDMENT:** 12/31/2020

<b>ORIGINAL CONTRACT AMOUNT:</b>	\$	663,552.00
<b>PRIOR AMENDMENT(S):</b>	\$	-
<b>AMOUNT THIS AMENDMENT:</b>	\$	7,730,608.91
<b>REVISED CONTRACT AMOUNT:</b>	\$	8,394,160.91

**DESIGN-BUILD CONTRACT AMENDMENT**

**WHEREAS**, County and Design-Builder have entered into the Contract for the project referenced above; and

**WHEREAS**, construction of the project was anticipated to be conducted utilizing multiple Guaranteed Maximum Prices (GMPs); and

**WHEREAS**, design of the project has progressed to the point of selection of the technology provider and the specific equipment required. Design of the required electrical infrastructure expansion is also complete; and

**WHEREAS**, long-lead equipment must now be ordered and expansion of the electrical infrastructure must be constructed while design of the project is completed; and

**WHEREAS**, Guaranteed Maximum Price-1 (GMP-1) shall pertain to the purchase of long-lead equipment and construction of the electrical infrastructure expansion; and

**WHEREAS**, County and Design-Builder, pursuant to Article 3, have agreed to incorporate GMP-1 into the contract for the purchase of long-lead equipment and construction of the electrical infrastructure expansion; and

**WHEREAS**, COUNTY's acceptance of GMP-1 is subject to the understanding of the Parties that all elements of future GMPs, if any, are and remain negotiable; and

**WHEREAS**, COUNTY and DESIGN-BUILDER pursuant to Article 3 have agreed to increase the Contract amount as identified in GMP-1.

**NOW, THEREFORE**, it is agreed as follows:

**CHANGE:** **ARTICLE 3 – Scope of Services, Section 3.1**

**Replace** - Exhibit A – Preliminary Schedule **with** Exhibit A – Preliminary Schedule – GMP-1 (3 pages).

**Add** - Exhibit C – Phase 2 – Construction Services – GMP-1 (80 pages) to the contract after Exhibit B – Phase 1 Scope of Services and Fee Schedule.

KSP

**CHANGE: ARTICLE 5 – Compensation and Payment**

**Add** - as sentence 3 to Article 5.2:

County's total payments to Design-Builder for Phase 2 Work – GMP-1, including sales taxes (if applicable), in the not-to-exceed amount of \$7,730,608.91.

**CHANGE: ARTICLE 6 - Insurance**

**Change Article 6.4.3.1 – Builder's Risk – Installation Floater**

From: Amount equal to the Contract Completed Value \$TBD.

To: Amount equal to the Contract Completed Value \$8,394,160.91.

This Amendment shall be effective on February 5, 2019.

All other provisions of the Contract, not specifically changed by this amendment, shall remain in effect and be binding upon the Parties.

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IN WITNESS WHEREOF, the Parties have affixed their signatures to this Amendment on the dates written below.

APPROVED:

\_\_\_\_\_  
Chairman, Board of Supervisors

\_\_\_\_\_  
Date

DESIGN-BUILDER:

  
\_\_\_\_\_  
Signature

SHAWN SILVESTER, V.P.  
Name and Title (Please Print)

\_\_\_\_\_  
Date

ATTEST:

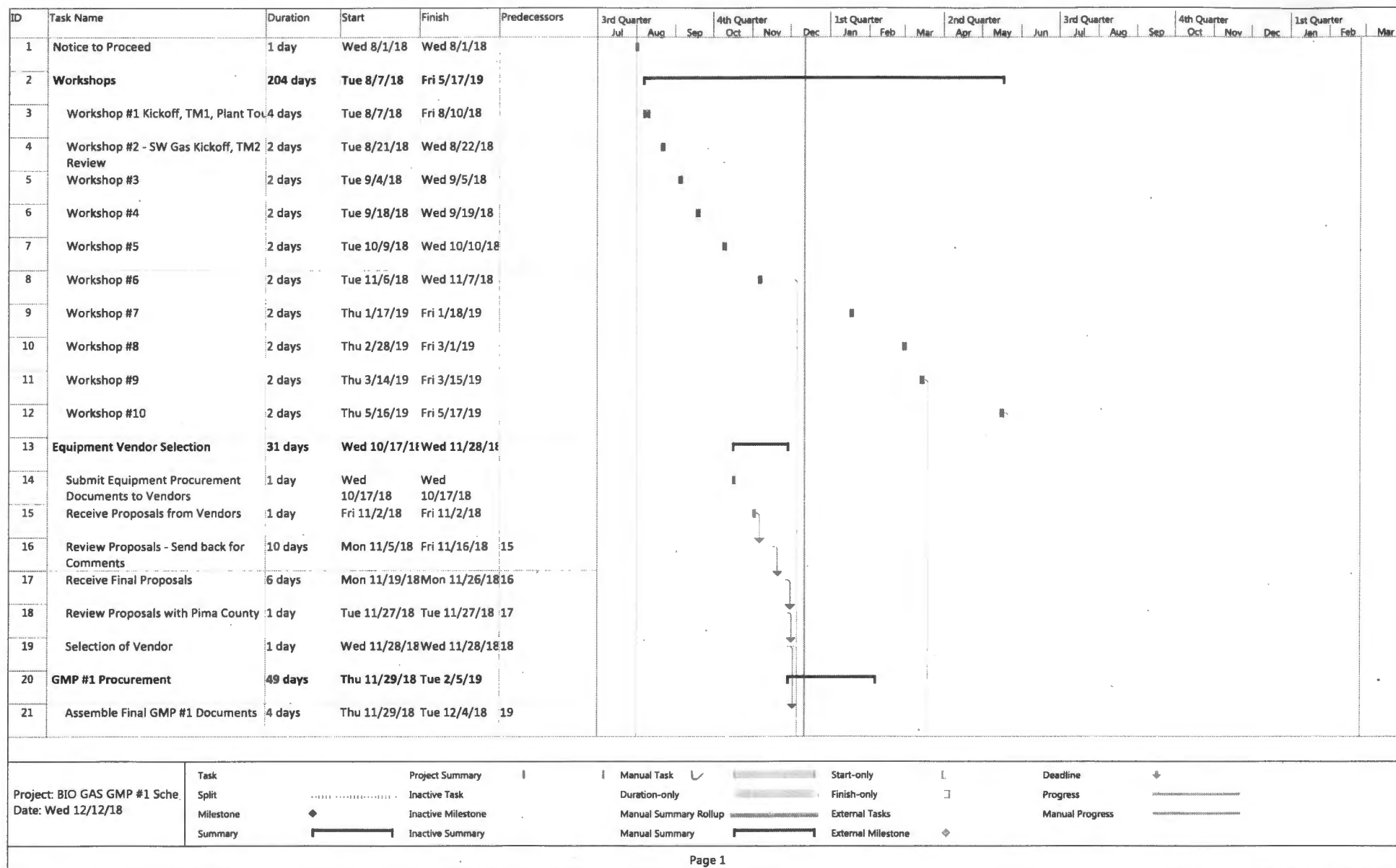
\_\_\_\_\_  
Clerk of the Board

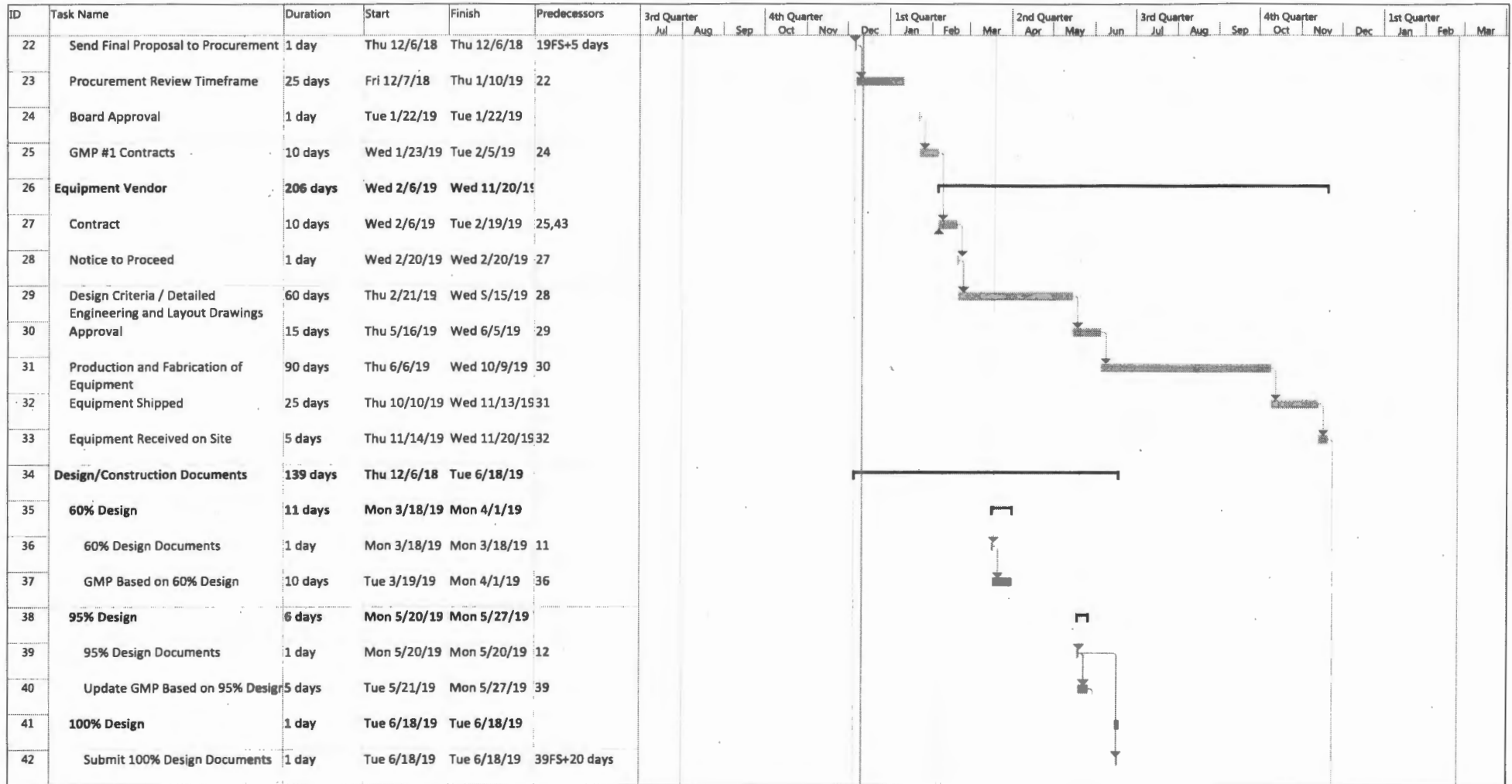
APPROVED AS TO FORM:

  
\_\_\_\_\_  
Deputy County Attorney  
**CHARLES WESSELHOFT**

Printed Name  
**JAN 17 2019**

\_\_\_\_\_  
Date





Project: BIO GAS GMP #1 Sche  
Date: Wed 12/12/18

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Progress

Manual Progress

ID	Task Name	Duration	Start	Finish	Predecessors	3rd Quarter			4th Quarter			1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			1st Quarter			2nd Qu	
						Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
43	Gas Sampling Analyzation	22 days	Thu 12/6/18	Fri 1/4/19	8FS+20 days																							
44	GMP #2	31 days	Tue 5/28/19	Tue 7/9/19																								
45	GMP Negotiation	10 days	Tue 5/28/19	Mon 6/10/19	40																							
46	Board Approval	1 day	Tue 6/25/19	Tue 6/25/19	45FS+10 days																							
47	Construction Agreement Executed	10 days	Wed 6/26/19	Tue 7/9/19	46																							
48	Construction of Site Electrical Expansio	86 days	Wed 2/6/19	Wed 6/5/19																								
49	Installation of Underground Conduit	30 days	Wed 2/6/19	Tue 3/19/19	25																							
50	Installation of Building	30 days	Wed 3/6/19	Tue 4/16/19	49SS+20 days																							
51	Above Ground Work	22 days	Wed 3/20/19	Thu 4/18/19	49																							
52	Building Electric	22 days	Fri 4/19/19	Mon 5/20/19	50,51																							
53	Install Switchgear	12 days	Tue 5/21/19	Wed 6/5/19	52																							
54	Construction	170 days	Wed 7/10/19	Tue 3/3/20																								
55	Construction of BioGas Facility	130 days	Wed 7/10/19	Tue 1/7/20	47																							
56	Installation of Equipment	20 days	Thu 11/21/19	Wed 12/18/19	53																							
57	Startup and Testing	40 days	Wed 1/8/20	Tue 3/3/20	55																							

Project: BIO GAS GMP #1 Sche	Task	Project Summary	Manual Task	Start-only	Deadline
Date: Fri 12/14/18	Split	Inactive Task	Duration-only	Finish-only	Progress
	Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
	Summary	Inactive Summary	Manual Summary	External Milestone	

# THE ASHTON COMPANY, INC.

*Contractors & Engineers*

2727 SOUTH COUNTRY CLUB ROAD, TUCSON, AZ. 85713

MAILING ADDRESS: P.O. Box 26927, TUCSON, AZ. 85726

PHONE: (520) 624-5500 FAX: (520) 791-9059

December 10, 2018

Pima County Wastewater  
Tres Rios WWTP

Attention: Bobby DeAngelo

Re: Biogas Cleaning and Utilization Project – GMP #1

Dear Mr. DeAngelo,

Attached you will find a detailed cost breakdown for the purchase of BioGas equipment and the installation of the Site Electrical Expansion portion for the BioGas Cleaning and Utilization Project. We have obtained two bids from two qualified vendors for the equipment package complete with a bid breakdown and a set of complete inclusions and exclusions.

The following clarifications and assumptions apply to the BioGas equipment portion of this GMP.

- After review of both vendor proposals, it was determined that DMT will provide the best value to Pima County
- This GMP includes only the equipment than what is specifically called out in the proposal from DMT.
- All costs to get the selected vendor under contract and the submittal review by the Design Builder to actively participate in the design of the biogas upgrading system supplied by the vendor are included. These breakdowns are attached.
- Equipment to be provided includes stainless steel vessels for H<sub>2</sub>S removal with ferrosorp media, FRP carbon vessels for VOC and siloxane removal with activated carbon, feed gas compression with medium voltage motor, compressed gas treatment, compressor enclosures including sound dampening, three stage CO<sub>2</sub> separation membranes, and dehydration system (heat exchanger/glycol chiller/coolant pump skid) for complete system. All other equipment not listed is not included.

#### LICENSE NUMBERS

ROC 070683 Class A General Engineering

ROC 070684 Class B-01 General Commercial

ROC 101880 Class C-11 Residential Electrical

ROC 101890 Class L-11 Commercial Electrical



- Products specifically not included:
  - a. Motor Control Center
  - b. SCADA controls or system integration service
  - c. Modifications or additions to the existing digesters, digester gas conveyance system or digester gas safety equipment
  - d. Modifications or additions to the flares
  - e. Analytical equipment for finished gas monitoring
  - f. Tail gas vent
- Services specifically not included:
  - a. Engineering services required during O&M manual review
  - b. Engineering services required during startup and commissioning, performance testing, or acceptance testing
  - c. Inspection or observation services
  - d. Engineering services otherwise required during construction, such as responses to RFIs and RFEs, development of change orders or field orders, etc.

The following clarifications and assumptions apply to the Equipment Procurement/Site Electrical Expansion portion of this GMP.

- This portion of work is based on the drawings provided by Pima County dated November 2018 by Canfield Engineering.
- The scope of work for this portion of the GMP is attached.

Attached exhibits show final costs, including engineering and supports costs for your review. Also attached is the vendor proposals which details their scope of supply as well as their clarifications. Should you have any questions or concerns regarding this proposal or any of the attached documents, please feel free to call me at (520) 624-5500, Ext. 203, or on my cell phone at (520) 909-4805.

Sincerely,

**THE ASHTON COMPANY, INC.**



Shawn Silvester, P.E.  
Vice President

CC: Jeremey Lay, Bartlett & West

**APPENDIX "F"**

**GMP 1 PROPOSAL**

**3GAS18 TRWRF BioGas Cleaning & Utilization Project**

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- **ITEM 1**                      **SUMMARY OF THE GMP**
- **ITEM 2**                      **SCOPE OF WORK**
- **ITEM 3**                      **SCHEDULE OF VALUES**
- **ITEM 4**                      **LIST OF PLANS AND SPECIFICATIONS USED FOR GMP PROPOSAL**
- **ITEM 5**                      **LIST OF CLARIFICATIONS, ASSUMPTIONS, AND EXCLUSIONS**
- **ITEM 6**                      **PROJECT SCHEDULE IN CPM FORMAT**
- **ITEM 7**                      **EQUIPMENT PURCHASE & CONSTRUCTION CASH FLOW**
- **ITEM 8**                      **SUBCONTRACTOR SELECTION FOR SBE REQUIREMENTS**

**BioGas Cleaning and Utilization**  
**GMP #1 - Equipment Procurement / Site Electrical Expansion**

	Description	Cost
1	Cost of Purchased Equipment (DMT or Suez)	\$4,487,000.00
2	Cost of Purchased Equipment and Material (Site Electrical Expansion)	\$1,120,279.00
3	Site Electrical Expansion (Base Bid)	\$778,411.00
4	Submittal Review/Engineering Services (B&W) As per attached sheet	\$81,130.00 <sup>*2</sup>
5	<b>Subtotal Direct Construction Costs</b>	\$6,466,820.00
6	General Conditions (Ashton) As per attached sheet	\$12,908.00 <sup>*2</sup>
7	Overhead (8.5%) (See Certified Statement)	\$542,783.65
8	Insurance (Builder's Risk)	\$8,500.00
9	Payment and Performance Bond	\$43,752.00
10	Subtotal	<b>\$7,074,763.65</b>
11	Construction Fee (4% of Line items 1,2,3,7,8)	\$277,478.95
12	<b>Subtotal Direct Construction Cost + Gen Cond., Overhead, Bonds, Insurance and Fee</b>	<b>\$7,352,242.60</b>
13	Arizona Gross Receipts Tax (10.1% of 65%)	\$51,102.68 <sup>*1</sup>
14	<b>Subtotal Direct Construction Cost + Gen Cond., Overhead, Bonds, Insurance, Fee and Tax</b>	<b>\$7,403,345.28</b>
15	<b>Guaranteed Maximum Price (GMP)</b>	<b>\$7,403,345.28</b>
16	County Contingency	\$327,263.63
17	<b>TOTAL CONTRACT COST</b>	<b>\$7,730,608.91</b>

Notes:

1. Taxes on any equipment (line items 1 and 2) have been excluded from this GMP. This is contingent upon Pima County issuing a tax exempt certificate for this work.
2. These costs were derived using the labor rates previously approved in the Pre-Construction contract phase of this project.

**SCOPE OF WORK - GMP#1**  
**ASHTON CONSTRUCTION / BARTLETT & WEST, INC.**  
**3GAS18 – TRWRF BIOGAS CLEANING & UTILIZATION PROJECT**

**Scope of Work:**

1. Design-Builder shall purchase long lead time equipment. This equipment includes:
  - Biogas Pre-Conditioning Equipment
  - Desulfurization Equipment
  - H<sub>2</sub>S/ VOC/ SI Polishing Equipment
  - Biogas Compressors
  - Purification Membrane Equipment
  - Glycol Chiller
  - Motor Control Center, Transformers
2. Design-Builder shall review and approve or take other appropriate action for biogas upgrading equipment Supplier in respect to shop drawings, samples, inspection reports, and manufacturer's data furnished by the equipment supplier.
3. Design-Builder will construct the electrical infrastructure required to furnish power to the new gas cleaning facility in accordance with Construction Drawings by Canfield Engineering & Integration, dated November, 2018.
4. Specifically excluded in this GMP is any construction related to building the gas cleaning facility or Southwest Gas related work.

## Schedule of Values

### BIOGAS GMP #1

[illegible]

**BioGas Cleaning and Utilization**  
**GMP #1 - Equipment Procurement / Site Electrical Expansion**

This GMP is based off of the following drawings titled Site Electrical Expansion dated November of 2018 from Canfield Engineering.

**DRAWING NUMBER**

G001

E001-E007

E010-E013

E015-E016

E022-E023

E030-E031

E035

E040-E041

E100-E105

E201-E202

### **Clarifications and Assumptions**

The following clarifications and assumptions apply to the BioGas equipment purchase portion of this GMP.

- After review of both vendor proposals, it was determined that DMT will provide the best value to Pima County
- This GMP includes only the equipment than what is specifically called out in the proposal from DMT.
- All costs to get the selected vendor under contract and the submittal review by the Design Builder to actively participate in the design of the biogas upgrading system supplied by the vendor are included. These breakdowns are attached.
- Equipment to be provided includes stainless steel vessels for H<sub>2</sub>S removal with ferrosorp media, FRP carbon vessels for VOC and siloxane removal with activated carbon, feed gas compression with medium voltage motor, compressed gas treatment, compressor enclosures including sound dampening, three stage CO<sub>2</sub> separation membranes, and dehydration system (heat exchanger/glycol chiller/coolant pump skid) for complete system. All other equipment not listed is not included.
- Products specifically not included:
  - a. Motor Control Center
  - b. SCADA controls or system integration service
  - c. Modifications or additions to the existing digesters, digester gas conveyance system or digester gas safety equipment
  - d. Modifications or additions to the flares
  - e. Analytical equipment for finished gas monitoring
  - f. Tail gas vent
- Services specifically not included:
  - a. Engineering services required during O&M manual review
  - b. Engineering services required during startup and commissioning, performance testing, or acceptance testing
  - c. Inspection or observation services
  - d. Engineering services otherwise required during construction, such as responses to RFIs and RFEs, development of change orders or field orders, etc.

The following clarifications and assumptions apply to the Equipment Procurement/Site Electrical Expansion Construction portion of this GMP.

- This portion of work is based on the drawings provided by Pima County dated November 2018 by Canfield Engineering.
- The scope of work for this portion of the GMP is attached.

BioGas Cleaning and Utilization  
GMP #1 - Equipment Procurement / Site Electrical Expansion  
Cash Flow Forecast

Date	Projected Cost
3/1/2019	\$639,000.00
4/1/2019	\$379,000.00
5/1/2019	\$850,000.00
6/1/2019	\$569,600.00
7/1/2019	\$950,000.00
8/1/2019	\$950,000.00
9/1/2019	\$755,000.00
10/1/2019	\$755,000.00
11/1/2019	\$950,000.00
12/1/2019	\$350,000.00
1/1/2020	\$222,728.28

<b>Total</b>	<b>\$7,370,328.28</b>
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<b>GMP</b>	<b>\$7,370,328.28</b>
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### STATEMENT OF PROPOSED SBE UTILIZATION

**\*\*Note: This form must be filled out completely or bid may be deemed non-responsive\*\***  
**SOLICITATION NO. [FOLDER #] - [TITLE]**

COMPANY NAME	CONTACT PERSON	PHONE NO.	TRADE/MATERIALS	DOLLAR AMOUNT	% OF BASE BID
AKOWSKI MASONRY	IVAN AKOWSKI	888-0977	MASONRY	\$24,360	.3%
ADVANCE AIR MECH.	KEVIN BEDIENT	792-9400	HVAC	\$33,973	.46%
A-D PAINTING	ALEX ORTEGA	573-0051	PAINT	\$20,263	.27%

I hereby certify by signing below that the foregoing SBE firms shall be contracted to work on the trades identified above and/or supply material and/or equipment for this project. The information shown above is a true reflection of the proposed SBE utilization. Only certified Small Business Enterprise firms whose primary or headquarters' business location is within the Pima County Statistical Area are eligible to meet the SBE goals on this project.

SIGNATURE



DATE

1/3/19

PRINTED NAME & TITLE

SHAWN SILVESTER, V.P.

FIRM NAME

THE ASHTON COMPANY, INC.

**BioGas Cleaning and Utilization  
GMP #1 - Subcontractor Breakdown**

<b>Description of Work</b>	<b>Subcontractor</b>	<b>Cost</b>
Masonry	Akowski Masonry	\$24,360.00
HVAC	Advantage Air Mechanical	\$33,973.00
Painting	A-O Painting	\$20,263.00
Controls	Climatec	\$8,340.00
Fire Alarm	Simplex	\$17,973.00
Security System	APL Access and Security	\$15,173.00
Engineering Services	Canfield Engineering	\$55,272.00

**Subcontractor Total    \$175,354.00**

**Site Electrical Expansion (Base Bid Total)    \$778,411.00**

**Total for Ashton Self Performed Work    \$603,057.00**



## Revised PROPOSAL

Date: 10/31/18 –11/1/18

Project: Tres Rios bldg.. 53 Install AC units

Submitted To: Ashton  
Attention: Tim Wilcox

**Proposed services and equipment are limited to items specifically listed below**  
**Option A: Provide and install (2) 5 ton wall mounted Bard AC units, duct sleeves through wall, Diffuser and grill at wall, (2) Tstat and low voltage wiring, (includes bac net connection) Test and Balance, warranty (Bard unit is 9.0 EER)**  
**Option B: Provide and install (2) 5 ton Daikin VRV-S split systems with refrigerant and condensate piping, Bac Net Connection, Warranty (Daikin unit is 18 seer)**

Excludes: **Climatec Controls**, Davis Bacon Wages, The servicing, support and warranty of existing material and equipment or owner provided equipment. Fire alarm work, framing, blocking, structural framing, relocation of existing utilities, blue staking, taxes/ permits/ fees. , Fire Sprinklers, Architectural Metals and HVAC are not necessarily included in the proposal, the proposal outlines what scope of work we are covering. When we quote multiple scopes of work please check before assuming we will accept a contract for selective portions.

Terms: Net 30 Days  
Option A: 33,973.00  
Option B: 31,683.00

We appreciate your consideration of this quotation and would like to thank you for your interest in Advantage Air Mechanical's services. Should you have any questions concerning the above quotation, please feel free to contact me personally @ (520) 780-6483 or at [Rob@AdvantageAirMechanical.com](mailto:Rob@AdvantageAirMechanical.com).

Respectfully Submitted,

**Rob Larson**

**ACCEPTANCE OF PROPOSAL:** All work is guaranteed to be as specified. All work to be completed in a professional manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders and will become an extra charge over and above the estimate. All agreements contingent upon delays beyond our control. Purchaser agrees to pay all costs of collection, including attorneys' fees. This proposal may be withdrawn within 20 days if not accepted. Advantage Air Mechanical to carry necessary insurance upon above work including workman's compensation and liability insurance. Advantage Air Mechanical does not employ any mechanical engineers. Equipment and distribution designed by Advantage Air is not guaranteed to achieve specific design criteria other than that which said equipment is rated for. Advantage Air Mechanical is licensed and bonded. All equipment and material are property of Advantage Air Mechanical until payment in full is made.

Date of acceptance: \_\_\_\_\_ Signature: \_\_\_\_\_

**[www.AdvantageAirMechanical.com](http://www.AdvantageAirMechanical.com)**

3238 East Forty Fifth Street Tucson, Arizona 85713

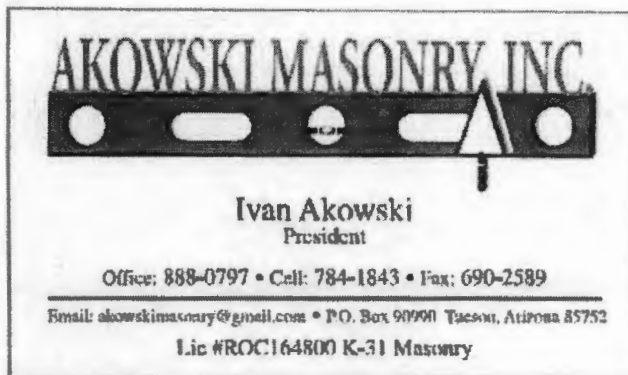
(520) 792-9400 Main (520) 885-3904 Fax

ROC No.214570 K-39/ C-39R Air Conditioning and Refrigeration

ROC No.263466 K-77/ L-77/C-37/ C-37R Plumbing, Solar and Fire Protection

ROC No. 263465 Architectural Sheet Metal

SBE Certified



**Date: 11/6/2018**

**Job Name: Bldg 53- Tres Rios- REVISED**

**Address: Pima County**

**Proposal to furnish the following described materials and labor for the above project upon the terms and conditions herein set forth.**

**Price Includes:**

**116 LF of 14' high 8" CMU wall. CMU bid as natural grey**

**TOTAL PRICE- \$24,360.00**

**EXCLUDED:**

**Footings or Concrete grade beams**

**Misc. steel, embeds for framing- furnishing or installing door/window frames**

**Building permits, fees, plan check costs-taxes, bonding or special inspections.**

**Weather protection during masonry installation**

**Overtimes**

**Cleaning or stain removal caused by others.**

**Stucco, paint, stain, sealants, weather or waterproofing.**

**Layout of bldg. corners/layout of supplied embeds.**

**Water source for mixing**

**Dumpster for debris**

**Removal or pumping of rain water from footings**

**Contact: Ivan Akowski @ 520-888-0797 520-784-1843 (cell) Akowskimasonry@gmail.com**



October 31, 2018

The Ashton Company  
Tim Wilcox  
P.O. Box 26927  
Tucson, Arizona 85726

**RE: Tres Rios Building 53 Budget Number**

Tim,

Below please find budget price to prep and coat outlined items. Proposed Coating Systems are listed below.

**Proposed Coating System**

**Interior Walls**

- Pressure Wash to remove surface contaminates
- One (1) Coat of Sherwin-Williams Heavy Duty Block Filler with Back Roll
- Two (2) Coats of Sherwin-Williams Pro-Industrial WB Epoxy

**Interior Decking**

- Pressure Wash to remove surface contaminates
- One (1) Coat of Sherwin-Williams Pro-Cryl Universal Primer
- One (1) Coat of Sherwin-Williams Sher-Cryl High Performance Finish

**Interior Floor**

- Pressure Wash to remove surface contaminates
- Two (2) Coats of Sherwin-Williams Macropoxy 646 With Non-Slip Additive

**Doors and Frames**

- SSPC-SP 2 Hand Tool Prep
- One (1) Coat of Sherwin-Williams Pro-Cryl Universal Primer
- One (1) Coat of Sherwin-Williams Sher-Cryl High Performance Finish

**Breakdown**

- Interior Walls           **\$9,432.00**
- Interior Decking       **\$5,681.00**
- Interior Floor           **\$4,100.00**
- Doors and Frames       **\$1,050.00**

**Above Price Includes**

- Labor
- Material
- Equipment
- Supervision
- Disposal

If you have any questions, please feel free to contact me at 520-271-1738.

Best Regards,

*Alex "Bruiser" Ortega*

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General Manager  
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**EQUIPMENT PURCHASE  
AND  
ELECTRICAL CONSTRUCTION  
COSTS  
BREAKDOWN**

## Contact information

Date Revised December 10<sup>th</sup> 2018

**Subject:** 9571.7 PIMA 675-833 scfm biogas to RNG

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## Introduction/Welcome

DMT has a long history of treating biogas and landfill gas. Since the founding of the company by Mr. Dirkse in 1987 we have been building biogas and landfill gas treatment plants. Some of our products are biogas dryers, chemical desulfurization, biological desulfurization and upgrading units.

Currently, DMT has about 55 employees who strongly believe in the future of renewable energy. Each employee is focused on our challenges of creating a green and prosperous future. They play a crucial role in the development of renewable energy business by applying new technologies and implementing smart and simple environmental solutions. Please have a look at our company video at: <http://www.youtube.com/watch?v=ONSnWhm5J3Y>. We have two biogas upgrading technologies in our program. The first system is based on high pressure water scrubbing; the DMT Carborex® PWS and the other technology is based on membrane separation; the DMT Carborex® MS. For your project we propose the DMT Carborex® MS. This system is easy to operate, economical and one of the most flexible systems on the market today.

The biggest advantages of the DMT Carborex® MS are:

1. Flexible and robust design with varying contaminant concentration of biogas
2. Flexible operational biogas flow capacity
3. Highest uptime to gas grid (up to 98% if required)
4. High methane recovery (up to 98% if required)
5. Quick start-up to meet gas grid specification (in 3 to 5 min)
6. Plug and play model
7. Easy to operate
8. compact and small footprint
9. Easy to protect against extreme weather condition
10. Little civil / ground works
11. More output due to less variance in outlet quality

This solution is part of our philosophy. Our team has the ambition to create a clear and prosperous future. We develop smart technologies that benefit our planet and its people. Our innovative designs, plants and service distinguish themselves in quality and return on investment. Indeed we want to contribute to a sustainable future without making concessions to prosperity. Doing this we always focus on human consequences. We consider the quality of cooperation with our clients and exchange of knowledge with our partners as essential. We achieve this thanks to the efforts of our greatest capital: our team of enthusiastic people who continuously strive to improve themselves. This is not just words. DMT operates on the successful 'Big Five for Life' principle. This principle combines the five most important goals of each employee with the five most important goals of our company in order to create a green and prosperous future.

## Commercial Proposal

This quotation is open for acceptance for a period of 60 days from the date of this offer.

### 2.1 Operational Data

#### 2.1.1 Methane loss

The average estimated methane loss for this project will average about 0.8-1%. Methane loss is defined as the mass flow of CH<sub>4</sub> in the off-gas leaving the stack, compared to the mass flow of CH<sub>4</sub> at the inlet of the compressor.

#### 2.1.2 Availability

The general availability of the plant is 98%. Availability is the percentage of time in a calendar year that the plant is available to process biogas per the agreed specification and deliver clean gas per the agreed specification or during which there is a relief event. Availability is defined to start 3 months after the plant is handed over. DMT must have access to the plant and operational data and logbooks. The customer should have a service contract with DMT to ensure good operation and maintenance. Recommended spare parts should also be available.

In table 2.1 below you will find the specification of the raw biogas and the calculated clean gas specification of the DMT upgrading plant for your project.

**Table 2.1 Operational Data**

	Biogas IN	Gas OUT	Unit
Variable Flow	243-833*	134-540	scfm
CH <sub>4</sub>	55-65	>97	%
Calorific value		>980	Btu/scf
CO <sub>2</sub>	35-45	<3	%
O <sub>2</sub>	Negligible	Negligible	%
N <sub>2</sub>	Negligible	Negligible	%
H <sub>2</sub> S	500	<4	ppm
VOC	5 ppm/average	Dew point less than 20F at pipeline	
Siloxanes	1 ppm/average	.5	ppm**
Dew point	Saturated	<7	Lbs/MMSCF
Temperature	75-95	75-95	°F
Pressure	0-1	220	psi(g)

\*All equipment is designed to be able to handle 833SCFM max with 500ppm max H<sub>2</sub>S. The Compressor is designed for 675 scfm biogas inlet. Flow rate can be increased by adding a booster to get a higher inlet pressure.

\*\*Non-detectable measurements is relative to measuring equipment. More clearly, doable with draeger tubes but not highly sensitive equipment.

\*Operational design numbers are based on 100ppm

In order to determine the exact performance of the offered unit, it is imperative that the customer submits a complete raw biogas analysis (gas chromatograph). If such analysis is not available, we advise you to take a sample as soon as the biogas digester is running at nominal flow. Any performance

guarantee claims can only be assessed if a full gas analyses is available. Gas components present in the biogas, which are unknown to DMT at the time of signing the contract, can have an unknown effect on the system.

**Table 2.2 Consumables**

Item	675 scfm	Unit
Total Installed Power <sup>*1</sup>	425	kW
Total Maximum Power Consumed <sup>*1</sup>	340	kW
Media for 100 ppm to 5ppm	83,600	Lbs/16months
Media for 5 ppm H <sub>2</sub> S/ Si/ VOC polisher removal <sup>*2, *3</sup>	20-24	lbs/day

<sup>\*1</sup>Major power consumers are chillers, blower and biogas compressor and sales gas compressor.

<sup>\*2</sup>Estimated Pricing: Activated carbon = 1.5-2\$/lb,

<sup>\*3</sup>Vessels designed for a total media lifetime of 6 months

## 2.2 Site Condition

**Table 2.3 Site Conditions**

Country / location	United States/Pima County, AZ
Relative humidity	40-80%
Process temperature	-20 to 90 F
Supply voltage	3 phases, 480/120V, 60 Hz
Skid-Mounted:	Dimensions*:
Bulk Desulfurization	20 ft x 15 ft
Pre-Conditioning skid	20 ft x 15 ft
H <sub>2</sub> S/ VOC/ Si Polishing skid	20 ft x 15 ft
Biogas compressor	15 ft x 10 ft
Carborex MS	45 ft x 15 ft
Sales Gas Compression	15 ft x 10 ft

\*Estimated, final dimensions will depend on detailed engineering

## 2.3 Scope of supply DMT and Client

In this chapter the scope of supply on both the side of DMT Clear Gas Solutions (Table 2.4) and that of the customer is given (Table 2.5).

**Table 2.4 Scope of Supply DMT**

Item	Description	In scope of supply
1	Pre-conditioner	Yes
2	Biogas boosting	Yes
3	H <sub>2</sub> S removal	Yes
4	Biogas compressor	Standard
5	Compressed gas treatment	Standard
6	DMT Carborex MS	Standard
7	Vacuum pump	Yes
8	Container for Carborex	Yes
9	Gas analysis equipment.	Standard
10	Piping, cabling, instrumentation within skids	Standard
11	Housing	Optional
12	Control system	Standard
13	Documents	Standard

**Table 2.5 Scope of Supply Client**

Item	Description
1	All civil works
2	Mechanical & Electrical Installation outside the battery limits
3	Cable ducts outside skid
4	Lightning protection
5	Heat tracing and insulation of the piping and skids
6	Piping and cabling outside the battery limits
7	Sewerage connections for condense water
8	Power supply as per the needs of DMT
9	Distribution switchgear and transformers.
10	Coordination, Arc flash and Harmonic Study
11	Calibration gasses for calibrating measurement equipment.
12	Inert gases, for flushing the equipment during start up and maintenance
13	Compressed air for actuators, 87 psig
14	Stable internet connection for VPN connection

**Table 2.6 Services that are included in the offer**

Item	Description	In scope of supply
1	Transportation to the site	Yes
2	Supervision of assembly of the plant on site	Yes
3	Assembly of the plant on site	No
4	Commissioning, start-up of the plant and training of operational personnel.	Yes

## 2.4 Delivery Schedule

**Table 2.7 Delivery Schedule**

Steps	Weeks <sup>*1</sup>
Design Criteria - Scope of supply	1-2
Detailed engineering and lay-out drawings	8-12
Approval	12 -15
Purchasing <sup>*2</sup>	15
Production	15-31
Test running	31-35
Ready for inspection (FAT)	35
Ready for shipment	35
Assembling on site	35-40
Site Acceptance Test (SAT) <sup>*3</sup>	40
Commissioning / start up	40-44
Operational Acceptance Test (OAT)	45

<sup>\*1</sup> Amount of working weeks after written order. This is our standard schedule; a quicker delivery time can be arranged depending on mutual agreement between the customer and DMT.

<sup>\*2</sup> Purchasing will start after the receipt of approved drawings

## 2.5 Payment Schedule

DMT Clear Gas Solutions will require a guarantee of payment. This can be achieved by an insurance, an irrevocable letter of credit or any other means which needs to be discussed upfront.

**Table 2.8 Payment Schedule**

### Payment Schedule for Design Phase Services:

- 1) Design phase services include preliminary and final shop drawings/submittals, attendance at pre-construction conferences, and any other Design Phase Service identified in these documents. Payment for design phase services shall be made in the following manner:
  - **35%** upon contract signed
  - **40%** upon final approval of submittal/shop drawings,
  - **20%** (total of 95 percent) upon submission of the plans and specifications to Pima County for approval,
  - **5%** (total of 100 percent) after Seller attends the pre-construction conference.
  - Retainage will not be held for the Design Phase Services.
- 2) Fabrication/Delivery of Goods and Start-Up Phase Services. For the purposes of measurement and payment (i.e., this Section), "Goods and Start-Up Phase Services" shall include all fabrication and delivery of all procured materials, equipment, and spare parts to the job site; field services and installation support associated with the Installation Contract; training and start-up activities; operation and maintenance manuals for the procured equipment; performance testing; and any continuing services or other Start-Up Phase Services identified in the Contract Documents. Payment for Start-Up Phase Services shall be made in the following manner:

### Payment schedule for Goods and Start-Up Phase Services:

- **25%** upon submission of materials invoices for major system components DMT will order everything at the same time but most items are major components and long lead items.
- **25%** half way of fabrication. Need this to pay vendors and expedite.

- **15%** (total of 65%) upon completion of fabrication, assembly and factory-testing of all equipment, including ancillary equipment, prior to shipment.
  - **20%** (total of 85%) upon delivery of all components, including major system components and all ancillary equipment.
  - **10%** (total of 95%) upon completion of Start-Up Phase Services.
  - Remaining 5% upon completion of any specified Performance Testing period.
  - See Paragraph 1.03 above for progress payment and final payment procedures.
  - The second-to-last payment request shall be accompanied by a bill of sale, invoice, or other documentation reasonably satisfactory to Design Builder warranting that Design Builder has rightfully received good title to the Goods from Seller and that, upon payment, the Goods will be free and clear of all liens. Such documentation will include releases and waivers from all parties with viable lien rights.
- A retainage of 5% will be withheld throughout Start-Up Phase Services from 100% of the Goods and Start-Up Phase Service payments. Retainage shall be paid to the Seller upon resolution of all "punch list" items to the reasonable satisfaction of the Design Builder, Owner and Engineer.

## 2.6 Pricing

Table 2.9 Pricing (USD, VAT, duties and taxes)

Description	Price (USD)
FLOW – 675 scfm:	
Price for:	
<ul style="list-style-type: none"><li>- one (1) <b>833 scfm Pre-condition skids</b> includes boosting, cooling and condensate vessel</li><li>- one (1) <b>833 scfm Bulk Desulfurization skid</b> removes H<sub>2</sub>S from 500 ppm to &lt;5ppm</li><li>- one (1) <b>833 H<sub>2</sub>S/ VOC/ Si polishing skid</b> removes H<sub>2</sub>S from 5 ppm</li><li>- Media proposed as included with discount for customer purchase</li></ul>	On Bid Data Sheets
Price for:	
<ul style="list-style-type: none"><li>- one (1) <b>1000 scfm Feed Gas Compressor</b> brings the pressure from 5 psi(g) to 250 psi(g) includes recycle flow</li><li>- one (1) skid mounted <b>833 scfm DMT Carborex® MS</b>, including biogas compressors, dryers and instrumentation system (membranes insert for 675 with empty slots to 833 SCFM)</li></ul>	See Bid Data Sheets
CNG compressor	Included in quoted pricing with deductions noted on separate sheet
Housing for sales gas compressor	
Housing for membrane compressor	
Housing for DMT Carborex	
Supervision of assembly of the plant at each site	See Bid Data Sheets
Commissioning, start-up and performance test at each site	See Bid Data Sheets
Cost for travel, hotel and related costs for the two items above	\$15,000 on Bid Data Sheet
	\$65,000
Shipping to site	Duties Included Also added to Bid Data Sheet

## Process of Delivery/Service

The installation is prefabricated and tested in our works before shipping to the site; the unit is then partly disassembled and packed for shipping. On site the unit will be reassembled.

We recommend using local workers for installation and assembly. In good cooperation with the client and with a well scheduled plan this will take approximately 7 days, depending on the local conditions.

### 3.1 Transport to the site

Transport means that DMT will transport the plant to the site.

In scope of supply: Yes, additional shipping cost added to revised Bid Data Sheet. This cost is \$65,000 for all supplied equipment.

### 3.2 Supervision of assembly of the plant on site

The client will organize local companies/businesses to assemble the plant, DMT will supervise by sending a supervisor.

In scope of supply: Yes

### 3.3 Complete assembly of the plant on site

DMT will organize a supplier for the plant assembly at site and will take care of the supervision.

In scope of supply: No

### 3.4 Commissioning, start-up of the plant, and training of operational staff

A DMT engineer will stay on site for final testing, start-up, and instruction/training of operating personnel. Before start-up the plant we need to have a full analysis of the available biogas (gas chromatograph). Time on site will be limited to 4 trips with max of 30 days of accumulated time. Additional days will be charged at \$1,200/day per person.

In scope of supply: Yes, as detailed below from Buyer provided Specifications. With additional days at \$1200/day.

#### Phase Services

#### 1. Start-Up

##### a. Seller's field representative

- 1) For the ADGPS, the Seller shall provide services of a qualified factory field representative for thirty (30) days spread over four (4) trips to the project site. Travel time shall not be included in the thirty days. Cost for Start-up services shall be included in the Seller's Offer.
- 2) The Seller shall submit the name, qualifications, and project experience including contact name(s) and phone number(s) of the proposed field representative to the Design Builder a minimum of 5 weeks prior to that individual being on-site.
- 3) The field representative shall be trained and qualified to make programming changes to the Seller's control system.

##### b. Field representative services and responsibilities

- 1) Services shall include time to instruct, coordinate, and interface with the Design Builder and System Integrator, inspect the installation prior to start-up, make all necessary adjustments prior to and during start-up, make repairs and/or replacements of membrane components as necessary to meet design operation conditions, and all direct Start-Up activities for each unit process.



- 2) The Seller's field representative shall test communications between Seller's control system and the other unit processes described in this contract.
- 3) The Seller's field representative shall direct the Design Builder in the installation of Seller's equipment.
- 4) The Seller's field representative shall verify the installation and initial operation of the ADGPS.
  - (a) Upon completion of system installation by the Design Builder, the field representative shall inspect the completed work and provide documentation to the Design Builder and Engineer on the operational readiness of the equipment.
  - (b) The documentation will certify that the equipment has been installed according to the Seller's requirements, that it has been started and placed on-line, that it has been tested according to the Seller's instructions, and that operator personnel have been instructed and trained.
- 5) The actual performance of the ADGPS shall be verified by the Seller's field representative and Buyer's Engineer to demonstrate that the purified gas conforms to the specified limits.
- 6) The Seller's field representative shall troubleshoot and correct any deficiencies causing failure to meet the specified performance, including without limitation, replacement of the Membrane Modules and any other components at no cost to the Design Builder.
- 7) The Seller's field representative shall generate performance and monitoring reports on Seller's control system and compare the report values to those in the sample reports provided in the equipment's O&M Manual described herein.
- 8) Seller's field representative will make any programming changes necessary to complete the startup of Seller's equipment and controls.
- 9) Start-Up will not be considered complete until all the equipment provided by the Seller is fully functional, including the generation of accurate production and monitoring reports. Abbreviated, expedited, or shortened operations to test the processes and equipment shall not be acceptable.

## 2. Training

- a. Seller shall provide on-site training to Owner's staff about proper use and maintenance of the furnished equipment after Start-Up activities have been completed. Formal training may not commence until all equipment provided by the Seller is fully functional and operational, and the Performance Testing has been completed. Include five (5) days, not including travel, and one trip to the project site to complete the required training.
- b. This on-site training shall include both classroom and hands-on operation training.
- c. Training shall be provided by a senior process engineer for both theory and specific hands-on instruction.
- d. Training shall include the following at a minimum:
  - 1) Theory of Operation
  - 2) Control System Overview
  - 3) Trouble Shooting
  - 4) Maintenance
  - 5) Process Optimization
3. Discretionary Visits
  - a. The Seller shall also include on-site time for three (3) days, to be used at a time of the Owner's discretion, for addressing any operational questions or refresher training.
  - b. Unless otherwise approved by the Owner, the factory field representative shall be the same individual for all on-site activities associated with the ADGPS.
4. Performance Testing

- a. At the conclusion of Start-Up for of the ADGPS a 15-day performance testing period will begin that will allow the Owner to verify that the ADGPS system is meeting all the performance requirements as stated in these documents.
  - 1) During this period, the Owner will operate the ADGPS as recommended by the Seller based on the gas flows available from the wastewater treatment plants existing digestion facilities. If applicable membrane modules shall be isolated to account for the reduced gas flow undergoing purification.
  - 2) Time and associated expenses for the Seller's staff to re-design any portion of ADGPS not meeting design performance conditions will be covered by the Seller.
  - 3) Seller shall include in Seller's Offer the analysis cost of ten (10) grab samples to be tested per Method TO-15 utilizing Summa containers.
    - (a) Grab samples shall be analyzed to determine outlet VOC and siloxane concentrations.
    - (b) Summa Containers shall be utilized to take the samples.
  - 4) The Seller shall make the necessary adjustments and/or repairs, or equipment replacement in order to meet design performance requirements.
- b. If repair or replacement of any equipment is required during the performance testing, the following testing period extensions will apply.
  - 1) If repair or replacement of any equipment is required during the performance testing period, the affected equipment shall be repaired/replaced and the performance test shall start over to continue for another period of 15 days.
- c. At the end of the performance testing period, the Engineer will conduct a performance analysis to ensure that the plant is operating as specified in these documents.
  - 1) The written report will be provided to the Seller at this time and the Seller will have 30 days to remedy any issues noted in the analysis.
  - 2) Any re-design and/or implementation costs associated with achieving the specified design requirements shall be covered by Seller.

## 3.5 Acceptance Tests

### 3.5.1 Factory Acceptance Test (FAT)

A factory acceptance test is carried out for the customer in the workshop.

### 3.5.2 Site Acceptance Test (SAT)

After installation a Site Acceptance Test is carried out for the customer onsite.

### 3.5.3 Operational Acceptance Test (OAT)

After installation, commissioning, and start-up of the plant according to the DMT manual, there will be a performance test. The performance test usually takes up to 4 working days, during which the gas flow and gas composition have to be stable and all necessities such as gas, power, water and analytical data are available as determined by an independent party. In case of non-performance the company DMT will be given a reasonable amount of time to investigate the non-performance and take the necessary actions to get the process within the specified limits. If during the investigation it is found that the cause of the non-performance is outside of the responsibility of DMT, all extra costs for DMT personnel will be charged.

DMT will provide a protocol for this performance test. Results of the performance test will be reported by DMT.

Any visits by DMT engineers outside of the scope mentioned above, for instance for analysis, trouble-shooting, instructions, maintenance, etc. will be charged.

## **Service & Maintenance Plan**

In this chapter you will find the detailed description of the main service items offered in this proposal.

### **4.1 Service and Maintenance Options**

#### **4.1.1 Availability for operational support**

In case operational issues arise during the daily operation of the biogas upgrading plant, the operator might need support from DMT in order to detect and solve the problems. By including the 24/7 "operational support availability" feature, remote access to the installation and operational support via telephone will be provided at any hour of the day. The cost of any process technical support will be charged subsequently. An adequate internet connection should be provided by the customer.

#### **4.1.2 Reporting**

Regular written reports of your biogas upgrading installation can secure a consistent documentation and a smooth and continuous follow up of the system performance throughout its lifetime. By including this option DMT will log in at least weekly to monitor the performance and pro-actively suggest actions for process optimization along with a monthly report.

#### **4.1.3 24/7 Call out support**

If operational problems occur, immediate troubleshooting can be crucial in minimizing the down time caused. Including the "24/7 call out support" option will secure access to prompt troubleshooting by DMT. After notifying or reporting the failure if required a site visit will take place within 12 hours. The call out support is provided by at least one engineer (only for emergency repairs). Service hours and travelling time costs are subsequently charged on a case by case basis.

#### **4.1.4 Service visits**

In order to ensure maximum availability and uptime of the installation, periodic service and maintenance by professionals should be performed according to the manual. With this service feature DMT will organize two service visits per year according to the maintenance requirements of the installation. Regular maintenance will be performed and/or work by sub-contractors will be organized and supervised. All sensors will be calibrated and wear parts and consumables will be replaced. If required the oil of the compressor(s) will be replaced. DMT will arrange the timely order and delivery of the wear and tear parts as well as service consumables such as compressor oil, oil separators and filters that are required for the service visits. After every service visit the client will receive a detailed report on the mechanical condition of the system along with the recommended actions. This option is including travelling time and costs.

## APPENDICES

**A – DMT Biogas Upgrading Process Components in detail**

**B – Operation & Maintenance**

**C – Design Standards and Specifications**

**D – References**

**E – Closing statement**

## DMT Biogas Upgrading Process in Detail

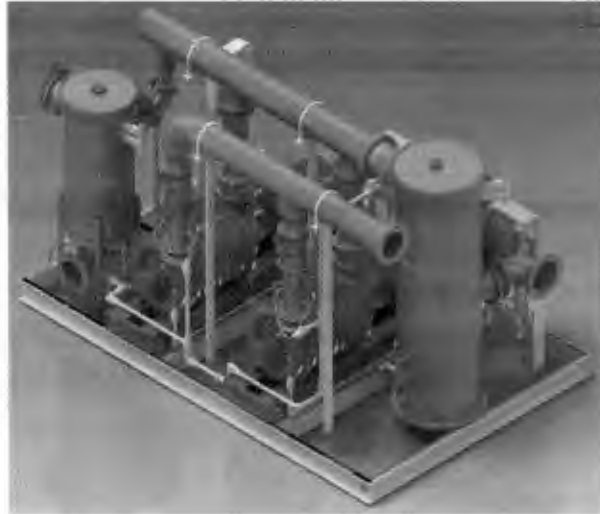
Biogas can be produced from different sources such as anaerobic digestion or land fill. This gas has a lower calorific value than natural gas. If the calorific value is increased, it may be used for the same applications as natural gas. Increasing the calorific value is also referred to as upgrading of biogas and mainly involves the removal of CO<sub>2</sub>, H<sub>2</sub>S and H<sub>2</sub>O from the raw gas of the land fill or anaerobic digestion. It is common to feed the upgraded biogas into the public natural gas grid, but using the gas as vehicle fuel is also a very economical way of using this gas

### **Biogas boosting**

A biogas booster will be installed to increase the raw biogas pressure.

### **Pre-conditioner**

The dehumidification will take place by cooling down the gas to a temperature and dew point of 50F. The pressure drop through the pre-conditioning will be approximately 0.5 psi(g)



#### **H<sub>2</sub>S Treatment**

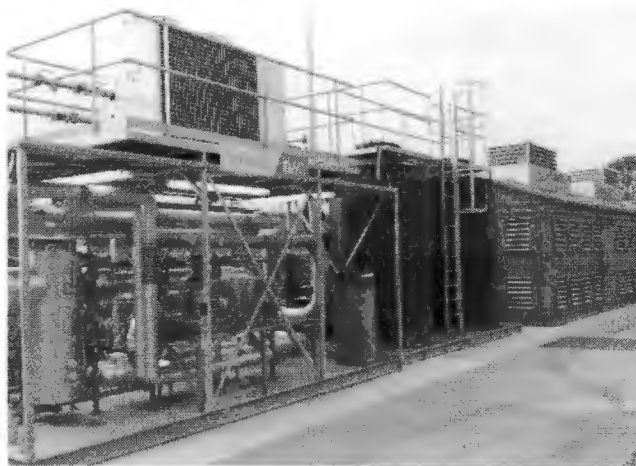
At the request of the customer, a pelletized Ferric Hydroxide Media will be used to treat 500 ppm of H<sub>2</sub>S prior to the polishing step. The two vessels will be Stainless Steel, in lead/lag configuration, including first fill of media with option for direct purchase discount.

#### **Polishing Step**

Hydrogen sulfide, Siloxanes and Ammonia are removed using carbon filters skids. The system includes two vessels and all the necessary interconnecting piping to allow for lead-lag operation. The media proposed is a catalytic high capacity media which efficiently converts H<sub>2</sub>S into elemental Sulfur. Siloxane and Ammonia will be removed in a similar fashion.

This media will provide the highest performance and autonomy for this application.

The pressure drop through the system will be ~2 psi(g)



Conditioning and Polishing Skid

#### **Biogas Compressor**

The biogas compressor(s) will bring the pressure of the biogas to system pressure of 232-250 psi(g), the temperature will increase to 220 F. Two different approved options have been presented.



Feed Gas Compressor

#### **Compressed gas treatment**

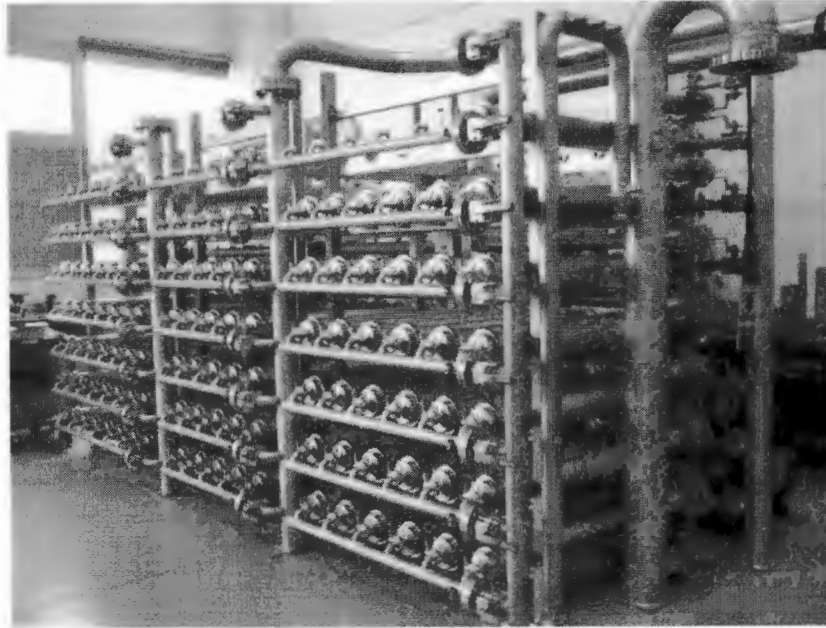
The compressed gas will go through a series of filters and heat exchangers to condition the gas for the membrane system:

Gas temperature will be lowered to 40-45°F.

#### **DMT Carborex® MS**

The principle of membrane separation is that the components of a gas mixture are separated by the difference of solution-diffusion through a polymer. The level of separation is determined by the flux of  $\text{CO}_2$  through the membrane. The permeability of various components like  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and  $\text{H}_2\text{S}$  compared to  $\text{CH}_4$  gives the selectivity ( $\alpha$ ) of the membrane. The selectivity depends on the characteristics of the polymer used for the membrane.

DMT has chosen high selective membranes for the highest selectivity ( $\text{CO}_2/\text{CH}_4$ ) and the lowest recycle of biogas/WWTP digester gas. The high selectivity number (50) yields better  $\text{CO}_2$  removal performance compared to other membranes. Also, the high selective membrane has the ability to remove partial  $\text{N}_2$  and  $\text{O}_2$  which decreases the sizing of bulk removal of nitrogen and oxygen removal system. Because of lowest recycle of biogas gas (20 -35%) compared to all other membrane products (50 – 60%) in the market, this in turn reduces the power cost and the sizing of the feed biogas/WWTP digester gas compressor.



DMT Carborex MS membrane skid

#### Vacuum blower

A vacuum pump could be installed to lower the pressure of the permeate (CO<sub>2</sub>-flow) of stage 2 depending on the outcome of the final engineering.

#### Gas analysis equipment- Installed between Lead/Lag filters

The following analysis and/or indicators are included in our delivery:

	Principle	Scale	In scope of supply
Flow raw biogas	Thermal		Yes
Flow clean gas	Thermal		Standard
Flow off gas	Thermal		No
Methane content clean gas	Calculated	80-100%	Standard
Methane content off gas	IR	0-5%	No
Carbon dioxide clean gas	IR	0-5%	Yes
Oxygen content clean gas	EC	0-10%	Yes
Dew point in the clean gas	AOMS	-150 to +70	No
H <sub>2</sub> S content raw biogas	Chemical	0-50 ppm	No
H <sub>2</sub> S content clean gas	Chemical	0-50 ppm	Yes

Optional instrumentation package includes all instrumentation for a complete mass balance: Mass flow, CO<sub>2</sub> and CH<sub>4</sub> throughout the system (inlet, outlet, and stack). Mass flow recycle. H<sub>2</sub>S, O<sub>2</sub> at inlet and outlet. Dew point at outlet.

#### Sales Gas Compression

Sales gas compression is quoted, at the request of the customer, to provide the treated gas to the pipeline at an inlet pressure of 720 psig.

**Interconnecting piping, cabling, instrumentation**

Delivery of the system (plant Carborex®MS) includes piping, cabling and instrumentation within the skid.

The design and construction of piping between the skids is not included in DMT's scope.

The design and construction of electrical cabling is not included in DMT's scope.

Valves, transmitters, sample points, etc, on interconnecting piping are not scope DMT, unless clearly stated separately/ otherwise.

**Delivery**

Delivery includes assembling of the standard plant, skid mounted Carborex MS, skid mounted carbon filter with separate compressor on a skid.

**Control system**

The biogas upgrading plant is controlled by an Allen Bradley PLC (UL listed) with a local interface. The local control system with Human Interface is situated in the safe area. This handles all digital and analogue signals from the field mounted instrumentation and controls all the pumps, valves and other controlled equipment of the upgrading system.

The control system can be accessed remotely through a VPN internet connection provided by the client or EPC. Data logging is organized by user friendly Scada (Allen Bradley) system. The PLC and safety systems will be connected to a UPS. The UPS will last for 5 minutes, sufficient for a safe and efficient shutdown.

Some of the functions of the Operator Panel are available by remote control, using internet connection and log-in allowance. The connection from local to remote operation can be established by modem or Ethernet (LAN). The structure of the Operator Panel Menu, showing all displayed as well as changeable values, operation functions and other possibilities of the panel are given in a separate document called "Operator Panel Menu. That is part of each individual DMT gas upgrading system. The main hardware parts of the control system are the PLC, remote I/O and OPC-server.

Please note that the DMT system is a standalone unit and its controls must be integrated into the overall plant by the customer.

**Documents**

A hard copy and a digital version of the following documents will be delivered:

1. Project planning
2. Quality and inspection plan
3. P&ID
4. Process description
5. Control philosophy (basic, for operational purposes)
6. Operational Manual
7. Main component supplier manual; layout drawings (2D top vision to indicate location, sizing and connection point for DMT Skids)
8. Customer interface list
9. Equipment list
10. Single line electrical drawings including cable list
11. IO list (including customer signal interface)
12. Instrumentation and load list
13. Education/training plan
14. Certifications as applicable
15. HAZOP



All documents will be delivered in English. DMT will deliver one hard copy and one digital version. Any additional requirements regarding the documents will be charged extra.

## Operation & Maintenance

### Operation of the plant

The installation is fully automated, but needs to be monitored and inspected regularly by trained operators. Appropriate action might be needed in case of uncommon process variation. The control system watches the plant 24 hours a day. When there is a problem at night or in the weekend the control system can call a service engineer/operator for trouble shooting. All persons who will be responsible for operating the plant must be trained and certified by DMT.

### Maintenance of the plant

The maintenance, service and inspection of the plant needs to be done by skilled and trained people. This can be done by DMT engineers and / or can be organized by the client / others which are well trained by DMT. For some parts of the plant maintenance specialists are needed / recommended.

We recommend to contract skilled and professional engineers for this job. Maintenance service and inspection of the biogas upgrading plant should be done by skilled and trained people. This can be done by DMT engineers and/or employees or people involved from client/others which are fully trained by DMT engineers. For some parts of the plant maintenance specialists are needed/ recommended.

## Design Standards and Specifications

This biogas upgrading plant will be delivered according to standard DMT design, standards and technical specifications complying with general (inter)national regulations and legislations. Piping will be delivered according to US regulations for processing plants (ASME B31.3) and pressure vessels will be delivered including ASME U-stamp certification. The system partly classifies for hazardous zone as per Class I, Div II, Group D.

Other customer's standards and specifications are not known at this moment and therefore not included in this quote. The final P&ID of the process and specifications and brands of the main technical components can be discussed in case of an order.

A DMT employee will be available for two days to execute with our customer a site-HAZOP study (travel time and expenses excl.) Any agreed issues arising from the HAZOP which is solely an effect of the operation of the plant and is within the scope of DMT, and which has a high chance on personal injuries will be solved without additional costs. Safety data of the DMT-plant will be available.

### Codes and Standards for manufacturing

ASME Section VIII, Boiler and Pressure Vessel Code

ASME Boiler & Pressure Vessel Code (BPVC) Section II: Materials

ASME Boiler & Pressure Vessel Code (BPVC) Section V: Non-destructive Examination

ASME Boiler & Pressure Vessel Code (BPVC) Section VIII: Rules for Construction of Pressure Vessels Div 1

ASME Boiler & Pressure Vessel Code (BPVC) Section VIII: Rules For Construction of Pressure Vessels Div 2

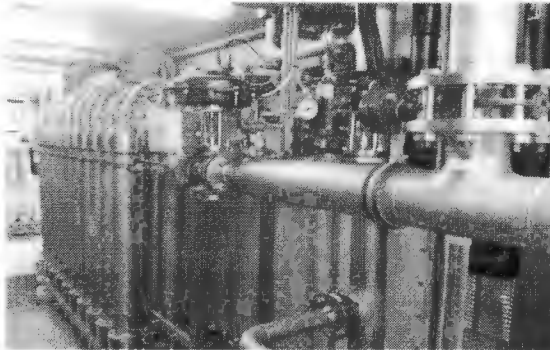
ASME/ANSI B31.3 Process Piping

ASME B16.5: Pipe Flanges and Flanged Fittings

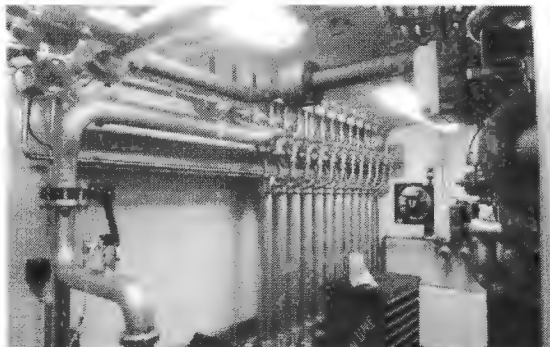
ASME B16.11: Forged Fittings, Socket-Welding and Threaded  
 ASME B16.34: Valves Flanged, Threaded and Welding End  
 API RP-520: Sizing, Selection and Installation of Pressure-relieving Devices in Refineries, Part I Sizing and Selection and Part- II Installation  
 ANSI/Hydraulic Institute Pump Standards  
 NFPA70/NEC70: Electrical distribution and control panels  
 NFPA79: Electrical Standard for Industrial Machinery  
 UL 508.A Standard for Industrial Control Equipment  
 API RP 500, Electrical Classifications for Gas Processing Plants (Div I)  
 Standard API RP 540-Recommended Practice for Electrical Installations in Petroleum Processing Plants.  
 Zone 2 Group IIA: instrumentation minimum requirement.  
 Zone 1 Group IIA: in areas requiring this level of qualification such as near pumps, compressors, relief valves vents and instrumentation vents as indicated in API RP 500.  
 ANSI/UL/CSA B149.6-15 Code for digester gas, landfill gas, and biogas generation and utilization

## References

DMT has installed systems on a broad range of flows and applications from 30 SCFM raw biogas to over 1500 SCFM raw biogas. We have units that inject the clean gas into the grid but also units which use the clean gas for vehicle fuel (CNG). Below are some pictures of the projects.



DMT Carborex® MS in the UK, 500 SCFM raw biogas upgrading for grid injection



DMT Carborex® MS in Sweden, 300 SCFM raw biogas upgrading for CNG usage





DMT Carborex® MS in the UK, 1500 SCFM raw biogas upgrading for gas grid injection

**PIMA COUNTY TRES RIOS WRF BIOGAS CLEANING & UTILIZATION PROJECT (3GAS18) RFP  
FOR EQUIPMENT - ANAEROBIC DIGESTER GAS PURIFICATION SYSTEM**

The following table shall be completed with the Bid amounts for the specified equipment. The costs presented in this table will be used when evaluating Bids.

BID		BID AMOUNT	
<i>Bidder shall provide a complete functioning system as stipulated by the Specifications. Buyer is tax exempt from state sales and use taxes.</i>			
<b>Goods</b>	<b>Barebone spare compressor</b>	<b>not included</b>	
Bulk Desulfurization (Section 440002)	Subtract \$75,000 if direct media purchase	Lump Sum	\$ 387,000
VOC and Siloxane Removal - Carbon Adsorption (Section 440004)	Sub \$9k for direct	Lump Sum	\$ 345,000
Membrane Feed Compressor (Section 440005)	Attached Alternate : \$534,000	Lump Sum	\$ 624,000
Purification Membranes (Section 440006)	Including Enclosure, controls	Lump Sum	\$ 1,670,000
Glycol Chiller (Section 440009)		Lump Sum	\$ 49,000
<b>Goods Subtotal - Bid Schedule 1</b>		<b>Lump Sum</b>	<b>\$ 3,075,000</b>
<b>Services</b>	<b>Shipping of all equipment</b>	<b>\$ 65,000</b>	
Design Phase Services		Lump Sum	\$ 650,000
Start-Up Phase Services	Added \$15k for travel	Lump Sum	\$ 105,000
<b>Services Subtotal - Bid Schedule 1</b>		<b>Lump Sum</b>	<b>\$ 755,000</b>
<b>Class 1 Div 1 Adder</b>		<b>119,000</b>	
Bid Adder for 304 Stainless Steel in place of FRP Carbon Adsorption Vessels		Lump Sum	\$ 55,000
Bid Adder for Medium Voltage Motor in place of 480 Volt Motor for Feed Gas Compression		Lump Sum	\$ 23,000
<b>Total Bid - Bid Schedule 1 (Sum of Goods Subtotal and Services Subtotal)</b>		<b>Lump Sum</b>	<b>\$ 4,157,000</b>
<b>BID FACTORS</b>			
<b>Delivery</b>	<b>45 Weeks</b>		
State the period of time for complete system fabrication or equipment procurement, if not fabricated, and delivery to Point of Destination after receipt of Notice to Proceed for Manufacture & Delivery of Goods.			
Submitted by: _____			
_____		Print Name and Title	
_____		Company Name	
_____		Date	
The total base bid may be combined with the acceptance of any combination of the alternate bid items as the Design Builder may choose. The alternates may be accepted in any order or combination, as determined by the Design Builder.			
Contract award shall be based upon the price bid by the lowest responsive, responsible Seller using the combination of base bid and alternates that is deemed to be in the best interest of the Project. The combination shall be at the sole discretion of the Owner and or Design Builder.			

change Lower  
w spare  
compressor

## PIMA COUNTY TRES RIOS WRF RENEWABLE FUELS UPGRADING PROJECT

The following table shall be completed with the Bid amounts for the specified equipment. The costs presented in this table will be used when evaluating Bids.

<b>BID</b>		<b>BID AMOUNT</b>
<i>Bidder shall provide a complete functioning system as stipulated by the Specifications. Buyer is tax exempt from state sales and use taxes.</i>		
<b>Goods</b>		
Finished Gas Compression Skid (Section 440008)	Lump Sum	\$ 372,000
<b>Goods Subtotal - Bid Schedule 2</b>	Lump Sum	\$ 372,000
<b>Services</b>		
Design Phase Services	Lump Sum	\$ included above
Start-Up Phase Services	Lump Sum	\$
<b>Services Subtotal - Bid Schedule 2</b>	Lump Sum	\$ 0
Bid Adder for Medium Voltage Motor in place of 480 Volt Motor for Finished Gas Compression	Lump Sum	\$ 23,000
<b>Total Bid - Bid Schedule 2 (Sum of Goods Subtotal and Services Subtotal)</b>	Lump Sum	\$ 395,000
<b>BID FACTORS</b>		
<b>Delivery</b>		
State the period of time for complete system fabrication or equipment procurement, if not fabricated, and delivery to Point of Destination after receipt of Notice to Proceed for Manufacture & Delivery of Goods.		<b>30 max</b> <b>Weeks</b> <b>for finished</b> <b>Gas compressor</b>
Submitted by:		
_____ Kyle Snyder, VP Sales, South & East	Print Name and Title	
_____ DMT Clear Gas Solutions	Company Name	
_____ 10-31-2018	Date	
The total base bid may be combined with the acceptance of any combination of the alternate bid items as the Design Builder may choose. The alternates may be accepted in any order or combination, as determined by the Design Builder.		
Contract award shall be based upon the price bid by the lowest responsive, responsible Seller using the combination of base bid and alternates that is deemed to be in the best interest of the Project. The combination shall be at the sole discretion of the Owner and or Design Builder.		

Name of Bidder: DMT Clear Gas Solutions Date: 10-31-2018

**Life Cycle Cost Analysis Bid Data (Sellers failing to complete this section in its entirety will be considered non-responsive)**

Where "Other Consumables" are indicated all maintenance items shall be included. These items include oil filters, compressor oil, packing replacement, membranes, and any other maintenance required of the proposed process.

<b>Section 440002 -Bulk Desulfurization</b>	<b>Bidder Input</b>
System Supplier/Fabricator	Granite Fuel or equiv
Media Vessels Materials of Construction	304 Stainless
Pelletized Ferric Hydroxide Media Replacement, lbs per replacement	83,600 lbs
Pelletized Ferric Hydroxide Media Cost, \$/lb	\$1.09/lb
Pelletized Ferric Hydroxide Media Bed Life at maximum gas flow and 500 ppm H <sub>2</sub> S loading, months	~16 months
Pounds H <sub>2</sub> S removed per pound of Pelletized Ferric Hydroxide Media	3.3lb/lb
Other Consumables 1 (Bidder to input Consumable and Annual Cost associated with the consumable)	Padded liner ~\$1200/vessel/media change
Other Consumables 2 (Bidder to input Consumable and Annual Cost associated with the consumable)	None
Other Consumables 3 (Bidder to input Consumable and Annual Cost associated with the consumable)	None
<b>Section 440004 - VOC and Siloxane Removal System</b>	
System Supplier/Fabricator	Granite Fuel or equiv
Proposed Media Adsorption Vessels Dimensions, Diameter by Height, FT (per vessel)	5 ft X 11 ft
Media Vessels Materials of Construction	FRP or 304 SS
Media capacity of each vessel, lbs	
Cost per lb of proposed Adsorptive Media, \$/lb	\$2.30/lb
Bed Life at maximum gas flow and average VOC/Siloxane Loading, months	6 months
Other Consumables 1 (Bidder to input Consumable and Annual Cost associated with the consumable)	
Anticipated Equipment Footprint, ft x ft	20 ft X 15 ft

Name of Bidder: \_\_\_\_\_ Date: 10/31/2018

**Life Cycle Cost Analysis Bid Data (Sellers failing to complete this section in its entirety will be considered non-responsive)**

Where "Other Consumables" are indicated all maintenance items shall be included. These items include oil filters, compressor oil, packing replacement, membranes, and any other maintenance required of the proposed process.

<b>Section 440005 - Membrane Feed Compressor</b>	
Compressor Fabricator	Vilter
Compressor Drive Motor Size, KW smaller for Alternate	480HP, 358kW
Consumed Electrical Load, KW (Based on 60% CH <sub>4</sub> , 833 SCFM, and average H <sub>2</sub> S, Siloxane, and VOC values) At 675 scfm per spec	450 kW max
Compressor Rebuild Frequency, years	10 years
Compressor Rebuild Cost, \$	See attached schedule
Filter Replacements, Oil Replacements, any other maintenance items	\$14,052
Other Consumables 1 (Bidder to input Consumable and Annual Cost associated with the consumable)	See attached estimates
Other Consumables 2 (Bidder to input Consumable and Annual Cost associated with the consumable)	
Other Consumables 3 (Bidder to input Consumable and Annual Cost associated with the consumable)	
Anticipated Equipment Footprint, ft x ft	
<b>Section 440006 - Membrane Separation System</b>	
Membrane Supplier/Fabricator	DMT Clear Gas
Membrane Replacement Frequency, years	More than 10 years
Cost to replace all membranes, \$	\$320,000
Other Consumables 1 (Bidder to input Consumable and Annual Cost associated with the consumable)	None
Other Consumables 2 (Bidder to input Consumable and Annual Cost associated with the consumable)	None
Other Consumables 3 (Bidder to input Consumable and Annual Cost associated with the consumable)	None
Anticipated Equipment Footprint, ft x ft	45 ft X10 ft

Name of Bidder: DMT Clear Gas Date: 10-31-2018

**Life Cycle Cost Analysis Bid Data (Sellers failing to complete this section in its entirety will be considered non-responsive)**

Where "Other Consumables" are indicated all maintenance items shall be included. These items include oil filters, compressor oil, packing replacement, membranes, and any other maintenance required of the proposed process.

<b>Section 440008 - Finished Gas Compression Skid</b>	
Compressor Fabricator	Ariel or equiv
Compressor Drive Motor Size, KW	40 kW
Consumed Electrical Load, KW (Based on 60% CH <sub>4</sub> , 833 SCFM, and average H <sub>2</sub> S, Siloxane, and VOC values)	450 kW max
Compressor Rebuild Frequency, years	3-5 years
Compressor Rebuild Cost, \$	\$90,000 estimated
Filter Replacements, Oil Replacements, any other maintenance items	\$9,000 estimated
Other Consumables 1 (Bidder to input Consumable and Annual Cost associated with the consumable)	
Other Consumables 2 (Bidder to input Consumable and Annual Cost associated with the consumable)	
Other Consumables 3 (Bidder to input Consumable and Annual Cost associated with the consumable)	
Anticipated Equipment Footprint, ft x ft	
<b>Section 440009 - Glycol Chiller</b>	
Glycol Chiller Supplier/Fabricator	Johnson Thermal Systems or equiv
Refrigeration System Drive Motor Size, KW	60 kW
Refrigeration System Consumed Electrical Load, KW (Based on 60% CH <sub>4</sub> , 833 SCFM, and average H <sub>2</sub> S, Siloxane, and VOC values)	56 kW
Refrigeration System Rebuild Frequency, years	5-7 years estimated
Glycol/Water Circulation Drive Motor Size, KW	5-7 kW
Glycol/Water Circulation Consumed Electrical Load, KW (Based on 60% CH <sub>4</sub> , 833 SCFM, and average H <sub>2</sub> S, Siloxane, and VOC values)	5 kW est
Glycol/Water Circulation Rebuild Frequency, years	Flush/replace every 10 years
Filter Replacements, Oil Replacements, any other maintenance items (annual cost)	\$1500/year est
Other Consumables 1 (Bidder to input Consumable and Annual Cost associated with the consumable)	Included above
Other Consumables 2 (Bidder to input Consumable and Annual Cost associated with the consumable)	
Other Consumables 3 (Bidder to input Consumable and Annual Cost associated with the consumable)	
Anticipated Equipment Footprint, ft x ft	20 ft x 15 ft



**SCOPE OF WORK - SUBMITTAL REVIEW**  
**ASHTON CONSTRUCTION / BARTLETT & WEST, INC.**  
**PIMA COUNTY TRES RIOS WATER RECLAMATION FACILITY BIOGAS UPGRADING**  
**EQUIPMENT PROCUREMENT GMP#1**

This work shall be performed as a part of GMP#1 between Ashton / BW and Pima County.

**Scope of Services:**

TASK 1: Submittal Review Phase Services. DESIGN-BUILDER shall perform submittal review services during the equipment design and fabrication phase of the biogas upgrading project. Services to be performed by DESIGN-BUILDER are as follows:

1. Design-Builder shall review and approve or take other appropriate action for biogas upgrading equipment Supplier in respect to shop drawings, samples, inspection reports, and manufacturer's data furnished by the equipment supplier. Such reviews and approvals or other actions are for the purpose of determining the general compatibility with the design concept of the project as a functioning whole as indicated in the contract documents.
2. The attached "Submittal Review Fee Schedule" describes the anticipated submittals to be reviewed and the estimated level of effort.
3. Design-Builder will directly administer the equipment procurement contract and coordinate between the Supplier and CLIENT as required.
4. Conduct up to one (1) kickoff conference meeting. For the meeting, Design-Builder shall prepare a kickoff conference agenda, lead the meeting, and prepare meeting minutes. The kickoff conference shall include a discussion of the Supplier's tentative schedules, procedures for transmittal and review of the Supplier's submittals, processing payment applications, critical sequencing, and change orders.
5. Design-Builder shall schedule, plan, conduct and provide meeting minutes for bi-weekly progress meetings via conference call with Design-Builder, Supplier, and CLIENT. Design-Builder shall prepare meeting agenda, lead the meeting, and prepare meeting minutes. Meetings shall include staffing as appropriate for the type of design work being performed. It is assumed that up to 4 progress meetings will be administered during this phase of the project.
6. Design-Builder shall review and approve or take other appropriate action in respect to shop drawings, samples, inspection reports, and manufacturer's data furnished by the Supplier. Such reviews and approvals or other actions are for the purpose of determining the general compatibility with the design concept of the project as a functioning whole as indicated in the contract documents.
7. Design-Builder shall interpret the design documents, respond to Supplier's requests for information, and recommend changes in the work as appropriate. Provide written correspondence for all interpretations, responses, and contract clarifications or changes between Supplier and Design-Builder to CLIENT.

## BARTLETT & WEST SUBMITTAL REVIEW/CALCULATION BREAKDOWN

		Jeremy E-X	James E-VII	Jodie E-III	Alli E-I	Jennifer E-IV	Total Cost	Cumulative
	Time (hr)						(\$)	Cost (\$)
Conduct On-Site Kickoff Meeting (Vendor, BW, Ashton)	14	6	8	118	98	129	\$2,550	\$2,550
Conduct Bi-Weekly Design Progress Calls (Vendor, BW, Ashton)	15	6	3	6			\$2,433	\$4,983
Review Preliminary and Final Design Criteria Summary Documents	1.5	0.5		1			\$221	\$5,204
Review Prelim., Intermed., and Final Detailed Project Schedule	0.5	0.5					\$103	\$5,306
Review Project Basis of Design	2.5	0.5	1	1			\$386	\$5,692
Review and Comment on Process Flow Diagram and Mass Balance - PFD (4 Sheets), Including Process Model Review	13	1	2	2	8		\$1,555	\$7,247
Review Vendor Preliminary and Intermediate Piping & Instrumentation Drawings (16-18 Sheets)	52	4	24	8	16		\$7,292	\$14,539
Review Preliminary Vendor Equipment List (and Update with Additional, Non-Vendor Supplied Equipment as Appropriate)	3.5	0.5	1	1	1		\$484	\$15,022
Review and Comment on Preliminary General Arrangement (GA) and Area Classification Drawings (3 Sheets)	5.5	0.5	2	2	1		\$767	\$15,789
Review and Comment on Preliminary General Arrangement Drawings (15-16 Dwg's)								\$15,789
H2S Removal Skid	4.5	0.5	1	1	2		\$582	\$16,370
Oxygen Feed System Data Sheets	3		0.5	1	1.5		\$348	\$16,718
H2S Media Data Sheets	3	0.5		1	1.5		\$368	\$17,085
H2S Removal Gas Analyzer	2		0.5	0.5	1		\$240	\$17,325
Pretreatment Dehydration	4	0.5	1	1	1.5		\$533	\$17,857
Cooling Skid	4	0.5	1	1	1.5		\$533	\$18,390
Chiller	2		1	1			\$283	\$18,673
Dry Cooler	2		1	1			\$283	\$18,956
Pretreatment Activated Carbon	4.5	0.5	1	1	2		\$582	\$19,537
Carbon Media Data Sheets	3.5	0.5		1	2		\$417	\$19,954
Pretreatment Activated Carbon - Gas Analyzer	3		1	1	1		\$381	\$20,335
Compressed Gas Treatment & Membrane skid	7.5	0.5	2	1	4		\$943	\$21,277
Compressed Gas treatment & Membrane Skid - Gas Analyzer	2		0.5	0.5	1		\$240	\$21,517
Review Final Process Design and Equipment/Instrument Selections								\$21,517
Final Piping & Instrumentation Diagrams (20-22 Sheets)	68	4	20	4	40		\$8,512	\$30,029
Final Equipment and Instrumentation Lists	46	2	16	4	24		\$5,874	\$35,903
Equipment/Instrumentation Datasheets	26	2	4	8	12		\$3,190	\$39,093
Review Final General Arrangement Drawings, Data Sheets, and Details								\$39,093
Plan for the Installation Site	3.5	0.5	1	1	1		\$484	\$39,576
H2S Removal	4.5	0.5	1	1	2		\$582	\$40,158
H2S Removal Gas Analyzer	2		0.5	0.5	1		\$240	\$40,397
Pretreatment Dehydration	14	1	3	2	8		\$1,720	\$42,117
Cooling Skid (and Heat Balance Calcs)	15	1	8	2	4		\$2,153	\$44,270
Chiller	6.5	0.5	1	1	4		\$778	\$45,048
Dry Cooler	3		1	0.5	1.5		\$371	\$45,419
Pretreatment Activated Carbon	4.5	0.5	1	1	2		\$582	\$46,000
Pretreatment Activated Carbon - Gas Analyzer	2		0.5	0.5	1		\$240	\$46,240
Feed Gas Compressor	24	2	4	2	16		\$2,874	\$49,114
Compressed Gas treatment & Membrane Skid	30	2	4	8	16		\$3,582	\$52,696
Compressed Gas treatment & Membrane Skid - Gas Analyzer	2		0.5	0.5	1		\$240	\$52,935
Finished Gas Compressor	26	2	6	2	16		\$3,204	\$56,139
Finished Gas Monitoring System (GC)	3.5		1	1	1.5		\$430	\$56,569
Review Prelim., Intermediate, and Final Mechanical Drawings								\$56,569
Prelim. Valve, Pressure & Temp Gauge Schedule & Data Sheets	56	2	6	8	36	4	\$6,388	\$62,957
Piping, Pipe Fittings, Pipe Insulation, Pipe Supports	11	1	2	8			\$1,479	\$64,436
Enclosure HVAC / Area Classification / Fire Protection Review	10.5	0.5	1	1		8	\$1,418	\$65,854
Review Prelim., Intermed., and Final Equipment Electrical Design Features								\$65,854
Load List	13	0.5	4	0.5		8	\$1,854	\$67,707
Single Line Diagram	13	0.5	4	0.5		8	\$1,854	\$69,561
Cable Configuration	19	0.5	2	0.5		16	\$2,556	\$72,116
Detailed Electrical Schematics	23	0.5	2	0.5		20	\$3,072	\$75,188
Enclosure Lighting	4.5	0.5	1	1		2	\$644	\$75,831
Review Preliminary and Final Instrumentation and Control Submittals								\$75,831

Gas Safety Monitoring Instrumentation List and Data Sheets	4.5	0.5	1	1	2		\$582	\$76,413
Input/Output list	10	1	8	1			\$1,643	\$78,056
Control Schematics/Diagrams	9.5	0.5	8	1			\$1,541	\$79,596
Panel Layout Drawings	5.5	0.5	4	1			\$881	\$80,477
Review and Comment on Factory Acceptance Test Report	4	1	2	1			\$653	\$81,130
Review and Comment on Installation Manual	0						\$0	\$81,130
Review and Comment on O&M Manual	0						\$0	\$81,130
Review and Comment on Startup and Commissioning Report	0						\$0	\$81,130
Review and Comment on Performance Test Report	0						\$0	\$81,130
TOTALS	616.5	50.5	169	97	234	66	\$81,130	

## ASHTON GENERAL CONDITIONS

Description of Work	Time (hr)	Project	Project	Total Cost (\$)	Cumulative Cost (\$)
		Manager	Engineer		
		\$142	\$104		
On-Site Kickoff Meeting (Vendor, BW, Ashton)	8	4	4	\$984	\$984
Bi-Weekly Design Progress Calls (Vendor, BW, Ashton)	12	6	6	\$1,476	\$2,460
Submittal Review	40	24	16	\$5,072	\$7,532
Contract Administration	40	32	8	\$5,376	\$12,908

# **THE ASHTON COMPANY, INC.**

*Contractors & Engineers*

2727 South Country Club Road, Tucson, Arizona 85713  
Mailing Address: P.O. Box 26927, Tucson, Az. 85726  
Phone: (520) 624-5500 Fax: (520) 791-9059

November 30th, 2018

## **Tres Rios Site Electrical Expansion**

### **ELECTRICAL SCOPE OF WORK:**

1) Perform work as detailed on the plans for project number C-432. Work to include:

- A. Electrical engineering and programming.
- B. Electrical equipment and system testing.
- C. Provide and install switchgear, circuit breakers and transformers.
- D. Excavation, installation of conduit, concrete encasement and backfill of duct banks for power and communication.
- E. Provide and install all manholes, hand holes and pull boxes as called out for on the drawings.
- F. Provide and install all medium voltage conductors with termination kits.
- G. Conduct medium voltage cable testing.
- H. Provide, install, terminate and test all 480 volt cabling.
- I. Complete construction of Building 53.
- J. Provide and install Motor Control Center for Building 53.

THE ASHTON COMPANY, INC.

Contractors & Engineers

Michael Mattice

Electrical Division Manager

ESTIMATE SUMMARY (COSTS)

Bid #	Engr Bid#	Quantity Unit	Manhrs	Direct	Perm	Constr	Equip-	Sub-	Direct	Indirect	Total	Bid Item
Bid Description			Unit	Labor	Matl	Matl	Memt	Contr	Total	Charge	Cost	U. Cost
300		1,000 LS						55,272	55,272		55,272	55,272.00
ELECTRICAL ENG PROGRAMMING												
325		1,000 LS						30,000	30,000		30,000	30,000.00
SYSTEM TESTING												
400		1,000 LS	104	4,480	142,572		1,274		148,325		148,325	148,325.07
2 SWITCH & 2 BREAKERS			104.00									
700		1,000 LS	80	2,769			3,447		6,216		6,216	6,216.41
POT HOLE			80.00									
1000		1,000 LS	643	26,502	321,862	408	5,603		354,376		354,376	354,375.67
PEM TO B53 DUCTBANK			642.81									
2000		1,000 LS	851	31,382	17,163	5,135	11,539	141,524	206,743		206,743	206,743.08
B53 BUILDING			851.42									
2600		1,000 LS	517	18,648	40,755		16,173		75,575		75,575	75,575.47
MV DUCT BANK TO BIOGAS			516.56									
3150		1,000 LS	287	11,893	22,469		2,752		37,114		37,114	37,113.58
B53 to HPS DUCT BANK			287.03									
3300		1,000 LS	107	4,425	6,110		1,293		11,828		11,828	11,827.52
B52 DUCT BANK			106.61									
3325		1,000 LS	260	9,575	17,747		6,985		34,307		34,307	34,307.08
COMM FROM 53 TO BIOGAS			260.40									
4600		1,000 LS	131	5,034	17,963		3,239		26,236		26,236	26,236.02
STRUVITE POWER DUCT BANK			130.79									
5300		1,000 LS	845	37,086	73,147				110,233		110,233	110,232.80
15 KV LOOP & TERMINATION			844.66									
5700		1,000 LS	650	28,539	41,841			33,147	103,527		103,527	103,526.89
BUILDING 53 SYSTEMS			650.00									
6000		1,000 LS	213	8,374	10,061		3,461		21,896		21,896	21,895.95
COMM STRUVITE TO ICW			212.79									
6500		1,000 LS	93	4,083	16,486		2,000		22,569		22,569	22,568.96
PHASE 1 ADDED WORK			93.00									
7800		1,000 LS	329	13,111	22,362		6,590		42,062		42,062	42,062.44
PHASE 1 SPARE CONDUITS			329.40									
9000		1,000 LS	223	9,289	369,742	222	860		380,113		380,113	380,112.82
MCC ADD ALTERNATE			222.54									
TOTALS:			5,332	215,189	1,120,279	5,764	65,217	259,943	1,666,392		1,666,392	
SUPERINTENDENT			704	41,807			21,303		63,110		63,110	
QUALITY CONTROL & OUTSIDE TECH								5,000	5,000		5,000	
PROJECT ENGINEER			352	13,799			10,652		24,450		24,450	
ELECTRICAL SUPERVISION			704	38,502			21,303		59,805		59,805	
SWPPP			63	1,000	1,765		1,070		3,834		3,834	
PROJECT LAYOUT								6,000	6,000		6,000	
SANITATION						800			800		800	
STORAGE SHEDS						1,440			1,440		1,440	

ESTIMATE SUMMARY (COSTS)

Bid #	Engr Bid#	Quantity Unit	Manhrs /Unit	Direct Labor	Perm Matl	Constr Matl	Equip- Ment	Sub- Contr	Direct Total	Indirect Charge	Total Cost	Biditem U Cost
						600			600		600	
						800			800		800	
			24	719			747		1,466		1,466	
			32	901		3,200	934		5,035		5,035	
			128	3,605	1,200		3,734		8,539		8,539	
			40	1,366			4,181		5,547		5,547	
						7,440			7,440		7,440	
				424		300			724		724	
			56	2,404		2,900			4,404		4,404	
			120	3,493			7,357		10,850		10,850	
							22,655		22,655		22,655	
INDIRECT	TOTALS:		2,223	1,000	108,784	1,200	16,580	93,935	11,000	232,498	232,498	
COST TOTALS	----->		7,555	1,000	323,972	1,121,479	22,344	159,152	270,943	1,898,890	2,322,474	1,898,890

----- ESTIMATE NOTES -----

Bid Date: 11/30/2018  
 Owner:  
 Estimator-In-Charge

Engineering Firm:

HoldAcct= N Subitems= N NonAdd= N

\*\* in front of the Biditem indicates a Non-Additive item  
 Last Summary on 11/30/2018 at 2:33 PM  
 Last Spread on 11/30/2018 at 2:37 PM

ARIZONA ELECTRIC SUPPLY

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3310 E. GAS RD #100

TUCSON AZ 85714

TEL: 520 622-7751 FAX: -

CONTACT: ROY @ ARIZONA ELECTRIC SUPPLY

QUOTE FOR: BE AEROSPACE, INC.

ACCT #: JJ-10690 B E AEROSPACE

1400 CORPORATE CENTER WAY

WELLINGTON, FL 33414

QUOTATION		PAGE 001 OF 004	
QUOTE #	DATE	REV #	REV DATE
1024342	10/25/18	025	11/30/18
QUOTE EXPIRES		PREPARED BY	
11/24/2018		RP	
SLS		INSL	
1645		1111	
FOB		FREIGHT	
SHIPPING POINT		PREPAID	

CUS PO #:

TRES RIO UTILITY EXT

JOB NAME:

TRES RIO UTILITY EXT

LN	QTY	MFR	CATALOG #	DESCRIPTION	PRICE	UOM	EXT AMT
01	40	PENN	LA250	6-250MCM ALCU LUG 1BBL 1H	1.75	E	70.00
02	90	PENN	LA600	2-600MCM ALCU LUG 1BBL 1H	4.88	E	439.20
03	2	FIT	ELGAL4X90X36R	4-IN-36RADIUS GALV ELBOW	118.00	E	236.00
04	2	FIT	EL4X90X48R	4-IN-48RADIUS GALV ELBOW	173.00	E	346.00
05	4	PVC	FA4	FEMALE ADPT.	182.00	C	7.28
06	69	PVC	BE4	BELL END	328.00	C	226.32
07	2,780	PVC	COND4	4 SCH-40 CONDUIT	185.00	C	5,143.00
08	50	PVC	EL4X90	4 90-DEG ELL w/BELL END	7.70	E	385.00
09	8	OZ	IBC400L25AC	4-IN INS GR BUSH	1,650.00	C	132.00
10	210	PVC	COND11/2	11/2 SCH-40 CONDUIT	57.00	C	119.70
11	12	PVC	EL11/2X90	11/2 90-DEG ELL w/BELL END	160.00	C	19.20
12	24	PVC	BE11/2	BELL END	185.00	C	44.40
13	4	PVC	FA11/2	FEMALE ADPT	45.00	C	1.80
14	4	FIT	ELGAL11/2X90	ELBOW 90D	7.00	E	28.00
15	4	OZ	IBC150L4AC	1-1/2 INS GR BUSH	444.00	C	17.76
16	290	PVC	COND2	2 SCH-40 CONDUIT	71.00	C	205.90
17	24	PVC	BE2	BELL END	230.00	C	55.20
18	12	PVC	EL2X90	2 90-DEG ELL w/BELL END	165.00	C	19.80
19	4	PVC	FA2	FEMALE ADPT	49.50	C	1.98
20	4	FIT	ELGAL2X90	ELBOW 90D	10.50	E	42.00
21	4	OZ	IBC200L4AC	2-IN INS GRD BUSH	625.00	C	25.00
22	8	X	ELGAL4X90X36R PVC	COATED	429.00	E	3,432.00
23	8	X	ELGAL4X90 PVC COATED		138.00	E	1,104.00
24	6	X	ELGAL2X90 PVC COATED		33.00	E	198.00
25	6	X	ELGAL11/2X90 PVC	COATED	22.50	E	135.00
26	16	X	CPLGAL4 PVC COATED		48.50	E	776.00
27	6	X	CPLGAL2 PVC COATED		11.85	E	71.10
28	6	X	CPLGAL11/2 PVC	COATED	7.50	E	45.00
29	20	X	GAL4 CONDUIT PVC	COATED	2,800.00	C	560.00

PLEASE NOTE: THIS IS NOT AN OFFER TO CONTRACT, BUT MERELY A QUOTATION OF CURRENT PRICES FOR YOUR CONVENIENCE AND INFORMATION. ORDERS BASED ON THIS QUOTATION ARE SUBJECT TO YOUR ACCEPTANCE OF THE TERMS AND CONDITIONS LOCATED AT SALES.OUR-TERMS.COM, WHICH WE MAY CHANGE FROM TIME TO TIME WITHOUT PRIOR NOTICE. WE MAKE NO REPRESENTATION WITH RESPECT TO COMPLIANCE WITH JOB SPECIFICATIONS.



## ARIZONA ELECTRIC SUPPLY

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3310 E. GAS RD #100

TUCSON AZ 85714

TEL: 520 622-7751 FAX: -

CONTACT: ROY @ ARIZONA ELECTRIC SUPPLY

QUOTE FOR: BE AEROSPACE, INC.

ACCT #: JJ-10690 B E AEROSPACE

1400 CORPORATE CENTER WAY  
WELLINGTON, FL 33414

QUOTATION		PAGE 002 OF 004	
QUOTE # 1024342	DATE 10/25/18	REV # 025	REV DATE 11/30/18
QUOTE EXPIRES 11/24/2018		PREPARED BY RP	
SLS 1645		INSL 1111	
FOB SHIPPING POINT		FREIGHT PREPAID	

CUS PO #:

TRES RIO UTILITY EXT

JOB NAME:

TRES RIO UTILITY EXT

LN	QTY	MFR	CATALOG #	DESCRIPTION	PRICE	UOM	EXT AMT
30	40	X	GAL2 CONDUIT PVC	COATED	1,025.00	C	410.00
31	20	X	GAL1 1/2 CONDUIT PVC	COATED	775.00	C	155.00
32	380	X	4" PVC SPACERS		90.00	C	342.00
33	26	X	2" PVC SPACERS		77.50	C	20.15
34	26	X	1 1/2" PVC SPACERS	USE 2"	77.50	C	20.15
35	1	PVC	CEMENTGAL	GALLON PVC CEMENT - CLEAR	20.50	E	20.50
36	42	X	DEADBREAK TERM. 200A	15KV SHLD. CBL. KIT	212.00	E	8,904.00
37	*						
38	1	X	LOT EATON GEAR PER	BOM TO FOLLOW (PH 2,3)	404,000.00	E	404,000.00
39	*		NOTE: I SEE ON JON'S BOM HE DID THE 60A N4X DISC'S AS				
40	*		N3R, I HAVE THE DOLLARS COVERED EITHER WAY INC. FUSES.				
41	*						
42	2	X	S&C PME9 PER BOM TO	FOLLOW INC. WELL INSERTS	26,500.00	E	53,000.00
43	*		FUSES AND SPARES. (PH 2,3)				
44	4	X	CONCAST #FC74-76-36-	6264 FIBERCRETE BOX PAD	1,450.00	E	5,800.00
45	1	X	LOT EATON ALT #4	MCC PER BOM TO FOLLOW.	363,000.00	E	363,000.00
46	*						
47	1	X	LOT FIXTURES PER BOM	AND COUNTS TO FOLLOW	2,801.00	E	2,801.00
48	*						
49	1	X	E-BOX 48X48X12HC J-	BOX W/BACK PANEL PAINTED	315.00	E	315.00
50	*		GREY FINISH.				
51	12	PENN	CEB3	3/4" ACORN CLAMP	185.00	C	22.20
52	6	GRROD	3/4X10	GROUND ROD	19.85	E	119.10
53	2	PENN	GPL6	250MCM GRD CLAMP CONN	38.00	E	76.00
54	2	CONTR	G12BOX	TRAFFIC RATED GRD. WELL	96.00	E	192.00
55	2	CONTR	G12LID TRAFFIC RATED	(GROUND)	108.00	E	216.00
56	2	X	GRND BUSS W/STAND	OFFS	128.00	E	256.00
57	3,650	WIRE	4/0 MV105 15KV/EPR-	PVC 133% SHLD.	5,271.00	M	19,239.15

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QUOTATION		PAGE	
		003 OF 004	
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11/24/2018		RP	
SLS	INSL		
1645	1111		
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SHIPPING POINT	PREPAID		

CUS PO #:

TRES RIO UTILITY EXT

JOB NAME:

TRES RIO UTILITY EXT

LN	QTY	MFR	CATALOG #	DESCRIPTION	PRICE	UOM	EXT AMT
58	1,100	WIRE	BARE4/0	BARE COPPER STR	2,900.00	M	3,190.00
59	880	WIRE	XHHW250	250 XHHW CU	4,215.00	M	3,709.20
60	3,787	WIRE	XHHW4	4 XHHW CU	724.00	M	2,741.79
61	900	WIRE	XHHW600	600 XHHW CU	8,900.00	M	8,010.00
62	88	WIRE	XHHW1/0	1/0 XHHW CU 2500'	1,650.00	M	145.20
				REEL			
63	500	WIRE	XHHW10STRBLK	XHHW-10-BLK-7STR-CU-5	175.00	M	87.50
				00CL			
64	2,000	WIRE	XHHW12STRBLK	12 XHHW STR BLACK 500	151.00	M	302.00
				SPL			
65	2,000	WIRE	XHHW14STRBLK	14 XHHW STR BLACK 500	102.00	M	204.00
				SPL			
66	203	WIRE	18/GA/TSP		145.00	M	29.44
67	318	WIRE	XHHW4	4 XHHW CU	600.00	M	190.80
68	272	WIRE	XHHW4/0	4/0 XHHW CU	3,300.00	M	897.60
69	310	WIRE	XHHW6	6 XHHW CU	550.00	M	170.50
70	816	WIRE	XHHW600	600 XHHW CU	8,900.00	M	7,262.40
71	266	WIRE	XHHW8	8 XHHW CU	374.00	M	99.48
72	100	REMEE	1PR CAT5E PLENUM	SHLD	125.00	M	12.50
73	154	REMEE	3PR CAT5E PLENUM	SHLD	202.00	M	31.11
74	128	REMEE	2PR CAT5E PLENUM	SHLD	145.00	M	18.56
75	128	REMEE	2PR 18GA PLENUM	SHLD	225.00	M	28.80
76	624	REMEE	6BNSM20	CAT6 BLUE PLENUM	277.09	M	172.90
77	2	FIT	ELGAL11/2X90	ELBOW 90D	806.25	C	16.13
78	160	CADDY	A12H1000PG	GALV. DEEP SLOTTED	144.94	C	231.90
				STRUT 10FT			
79	10	CADDY	A12H1000SS	DEEP STAINLESS STRUT	1,750.00	C	175.00
80	210	COND	GAL1	1" RIGID	305.00	C	640.50
81	41	FIT	ELGAL1X90	ELBOW 90D	471.55	C	193.34
82	48	FIT	CPLGAL1	GALV CPLG	133.13	C	63.90
83	320	PVC	COND1	1 SCH-40 CONDUIT	36.00	C	115.20
84	20	PHD	S2104AEG	1IN UNIVERSAL CLAMP	50.00	C	10.00
85	1	X	10X10X8 HC N1 J-BOX	W/BACK PANEL	131.00	E	131.00
86	4	FIT	ELGAL2X90	ELBOW 90D	1,050.00	C	42.00
87	500	COND	GAL3/4	3/4" RIGID	192.00	C	960.00
88	46	FIT	ELGAL3/4X90	ELBOW 90D	275.00	C	126.50
89	6	OZ	LB27	3/4 MALL LB COND BODY	5.90	E	35.40

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TUCSON AZ 85714

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ACCT #: JJ-10690 BE AEROSPACE

1400 CORPORATE CENTER WAY  
WELLINGTON, FL 33414

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QUOTE # 1024342	DATE 10/25/18	REV # 025	REV DATE 11/30/18
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SLS 1645		INSL 1111	
FOB SHIPPING POINT		FREIGHT PREPAID	

CUS PO #:  
TRES RIO UTILITY EXT  
JOB NAME:  
TRES RIO UTILITY EXT

LN	QTY	MFR	CATALOG #	DESCRIPTION	PRICE	UOM	EXT AMT
90	6	OZ	OZG270IG	3/4" COVER & FIP GASKET	4.10	E	24.60
91	230	PVC	COND3/4	3/4 SCH-40 CONDUIT	23.50	C	54.05
92	99	PHD	S2103AEG	3/4 UNIVERSAL CLAMP	46.00	C	45.54
93	26	DOT	BK38	3/8-16 BEAM CLAMP	185.00	C	48.10
94	2	LEV	CS3202I	3WAY 20A 277V IV TOGGLE	246.00	C	4.92
95	18	PVC	FA4	FEMALE ADPT.	185.00	C	33.30
96	18	OZ	IBC400L25AC	4-IN INS GR BUSH	1,525.00	C	274.50
97	40	COND	GAL4	4" RIGID	1,842.00	C	736.80
98	18	FIT	ELGAL4X90	ELBOW 90D	4,725.00	C	850.50
99	18	FIT	CPLGAL4	GALV CPLG	1,200.00	C	216.00
100	2	DOT	WTH400	4IN WEATHER TITE HUB	3,200.00	C	64.00
101	150	PVC	COND4	4 SCH-40 CONDUIT	194.00	C	291.00
102	17	PENN	BLM4/0S53	4/0AWG CRIMP LUG	4.35	E	73.95
103	2	OZ	FS1BC	1G FS BLANK COVER	11.00	E	22.00
104	7	LEV	GFNT2W	GFI 20A WHITE	14.00	E	98.00
105	6	OZ	FDC175	1G MALL FDC BOX	19.75	E	118.50
106	3	OZ	FD175	1G MALL FD BOX	18.00	E	54.00
107	2	OZ	FS1SCS	1G STL TGL SW COVER	9.50	E	19.00
108	3	OZ	FS1GFCA	ALWP GF RCPT COVER	45.00	E	135.00
109	1	OZ	FDX175G	1G DEVICE BOX	55.00	E	55.00
110	1	OZ	FDC275	2G MALL FDC BOX	49.00	E	49.00
111	4	TAY	MX6200	METAL 2-GANG IN-USE COVERS	14.25	E	57.00
112	3	X	E-BOX 48 X 48 X 12	HC N4X W/BP	2,525.00	E	7,575.00
113	210	WIRE	1/0 MV105 15KV EPR	PVC 133% SHLD.	3,166.00	M	664.86

TOTAL: 914,404.16

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## Summary Bill of Material

**Project Name:** Tres Rios RWRD Site Electrical Expansion C 432  
**General Order No:**

**Negotiation No:** TU701101X8K1  
**Alternate No:** 0000

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Engineering Services	MV Breakers & CTs installation Assistance  EESS will test & install (2) VCP-W Breakers & (4) sets of CTs over (2) mobilizations and misc. hardware. EESS will tie existing CT wiring and install new PT wiring for (2) Allen-Bradley PM5000 meter. (2) mobilizations and misc hardware. Eaton's Arc Flash Safety Conditions apply. Switching by others. No material is included in this scope. Not to exceed 64-hours onsite. Four mobilizations total. Eaton is not responsible for outage costs. All work to be performed during regular business hours Monday thru Friday.  <b>Catalog No</b> AB Meter & MV Breakers <b>Designation</b> PH2 Breaker & Meter Install			

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	EESS SAT	***See Approval Drawings for Comments and Clarifications*** Start-up Contact, Contractor Ashton Construction Estimated Start-up Date: A Coordination Study does exist. It was performed by Eaton  <b>Designation</b> SITE ACCEPTANCE/TRAINING			

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	EESS Services	EESS Short Circuit and Coordination Studies, Arc Flash Hazard Analysis, Arc Flash Labels - Standard, PE Review / Stamp Required - Arizona  ***See Approval Drawings for Clarifications and Exceptions*** JON LOCKHART  <b>Designation</b> AF STUDY			

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	2	Engineering Services	1426-M8E PM 5000  Allen-Bradley 1426-M8E Power Monitor 5000 Power Quality  <b>Catalog No</b> 1426-M8E PM5000 <b>Designation</b> Allen-Bradley PM			



## Summary Bill of Material

**Project Name:** Tres Rios RWRD Site Electrical Expansion C-432  
**General Order No:**

**Negotiation No:** TU701101X8K1  
**Alternate No:** 0000

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Medium Voltage Assemblies	NEG# BLE92016JL  2 - 1200 AMP 150 VOP W 25 BREAKERS 15KV LOCATED IN SECTION 2 & 15 UPPER CELL 4 SETS OF 600 5 CT'S 2 KIRK KEYS FOR MAINS REVISED DRAWINGS FOR 72YA412 ENTERED UNDER SUFFIX APC EATON SELLING POLICY 25-000 SHIPMENT WILL BE 12 WEEKS ARO			

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Power Transformers	Power Transformer, 1, 72216 - Cooper Liquid Filled Padmount, 1500 KVA  <b>Designation</b> 53-TX-01A  <b>Qty List of Materials</b> 1 Tamper-Resist, Pad Mount, HTH Filled, Aluminum Windings 1500KVA			

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Power Transformers	Power Transformer, 1, 72216 - Cooper Liquid Filled Padmount, 1500 KVA  <b>Designation</b> 53-TX-01B  <b>Qty List of Materials</b> 1 Tamper-Resist, Pad Mount, HTH Filled, Aluminum Windings 1500KVA			

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Switchboards	Pow-R-Line CSwitchboard, Front Access: Front and Rear Align, Type 1, 480V 3-Phase 3-Wire, 2000 Silver Plated Copper Minimum Interrupting Rating: 65kA, Bus Bracing Rating: 65kA  <b>Designation</b> 53-SWBD-01A/01B  <b>Qty List of Materials</b> 1 Pow-R-Line C, Double Ended Lineup 5 Seismic Freestanding Label (IBC/CBC Seismic Qualified) 2 2000 Amp Silver Plated CU Main Structure 13 Nameplate 5 Auxiliary Switch 4A/4B 7 Padlockable lockoff device 3 Key Interlock (Breaker) 5 Digitrip 1150 LSI/G 2 2000 Amp Customer Metering - PXM2290, CTs With Display 2 PXM2290 METER/DISPLAY 60HZ 5A 90-265V AC/DC 2 SPD Series 250kA SPD, Standard w/ Surge Counter (Disconnect Included) 26 Ground Lugs(s) 2 2000 Amp Silver Plated CU Feeder Structure 2 Digitrip 310+ LSI 4 Thermal Mag Trip - Standard			



Powering Business Worldwide

## Summary Bill of Material

**Project Name:** Tres Rios RWRD Site Electrical Expansion C-432  
**General Order No:**

**Negotiation No:** TU701101X8K1  
**Alternate No:** 0000

### Qty List of Materials

- 2 1/8 inch Pull Box
- 1 2000 Amp Silver Plated CU Tie Structure
- 2 Maintenance mode beacon
- 2 Allen Bradley Power Monitor 5000
- 2 2000A 3P Magnum SB Brkr SBS-620 [Fixed-Manual], Trip 2000 A, Digitrip 1150 LSIG, (6) 3/0-750 kcmil, Mechanical, Bottom
- 2 400A 3P [HMCL 800A Frame], Trip 400 A, 310+ (3) 3/0-400 kcmil, Mechanical, Top
- 2 75A 3P [HFD 225A Frame], Trip 70 A, Thermal Mag (1) #14-1/0, Mechanical, Top
- 2 50A 3P [HFD 225A Frame], Trip 50 A, Thermal Mag (1) #14-1/0, Mechanical, Top
- 2 2000A 3P Magnum SB Brkr SBS-620 [Fixed-Manual], Trip 1600 A, Digitrip 1150 LSIG, (6) 500-750 kcmil, Mechanical Copper Only, Top
- 1 2000A 3P Magnum SB Brkr SBS-620 [Fixed-Manual], Trip 2000 A, Digitrip 1150 LSIG

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Automatic Transfer Switches	<p>Quote Date: 11/1/2018</p> <p>Product Family: Wall Mount</p> <p>Switch Type: Automatic Contactor 40A thru 1600A</p> <p>480v, 60hz, 3 Phase, 3 Wire, 3 poles</p> <p>Transition Mode: Open</p> <p>Controller Type: ATC-300+</p> <p>Continuous Current: 100 Amps</p> <p>Withstand: 30kA scc/10kA (0.025 sec)</p> <p>Normal Source Terminals: (1) #14-2/0 CU/AL</p> <p>Emergency Source Terminals: (1) #14-2/0 CU/AL</p> <p>Load Side Terminals: (1) #14-2/0 CU/AL</p> <p>Neutral Terminals: No Neutral Bar</p> <p>Standard Features: 1a, 2a, 3a, 4a, 5h, 5j, 5k, 5l, 6b, 7a, 8c, 8d, 12c, 12d, 12g, 12h, 14i, 14m, 15e, 15f, 23k, 26d, 26n, 26j, 26k, 26l, 32i, 35a, 42, 48f, 49c</p> <p>Optional Features: No Optional Features Selected</p> <p>Shipping State: AZ</p> <p><b>Catalog No:</b> ATC302X30100X,U</p> <p><b>Designation:</b> 53-ATS-01</p>			

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Motor Control Centers	<p>60 Hz, Class 2B+HS wiring, 480V 3-Phase Service, 65,000</p> <p>Bracing, Short-Circuit Rating, Bottom, incoming, NEMA 1 Gasketed</p> <p>21" Front Mt. Only enclosure, 2000A Copper Main Horizontal Bus,</p> <p>No Neutral, Main Breaker, Used X-Space, 126, Blank X-Space, 30,</p> <p>Future X-Space, 0, MCC Lead Time Code: U</p> <p><b>Designation:</b> 53-MCC-01A/01B (SVX)</p>			



Powering Business Worldwide

## Summary Bill of Material

**Project Name:** Tres Rios RWRO Site Electrical Expansion C-432  
**General Order No:**

**Negotiation No:** TU701101X8K1  
**Alternate No:** 0000

Qty	List of Materials
3	RGH-C Main Bkr (1600A trip), Lugs: 6-#2-600Kcmil
2	PXM2270 METER/DISPLAY 60HZ 5A 90-265V AC/DC
2	PXM2270
6	1500A Current transformer
4	600V Potential transformer
2	100A Active Harmonic Correction Unit (EESS startup services required Price/sched services separately)
3	SVX9000 VFD Constant torque 330 FLA, 480V HMCP
1	E125HCompact Bkr (50A trip)
2	E125HCompact Bkr (20A trip)
3	E125HCompact Bkr (30A trip)
2	E125HCompact Bkr (100A trip)
3	Wiremarkers at Each End
3	Terminal Block - Latching Pull-Apart, Std
3	#16awg, MTW Control Wire
3	Wiring Diagram on Door
3	Coil Surge Suppressor
1	RMS 310+ ALSI Trip
2	RMS 310+ ALSIG Trip w/ GF
3	Main Bkr Mechanical Key Interlock
2	250KA, SPD Standard + Surge Counter Features Package, with Circuit Breaker
1	18" Door
3	6" Door
12	12" Door
13	65KA Bus Bracing
13	Labyrinth, Isolated/insulated vertical bus barrier with shutters
13	600A Horiz. Cu Gnd Bus, 1/4" x 2" Bar
13	Sleeve Wrapped Insulated main bus
1	Enclosure End Braces - IBC/CBC Seismic Qualified
13	600A Vertical Bus (Tin-plated cu)
13	Structure Floor Leveling Channel Sills
13	Tin Plated horizontal bus
12	2000A Copper Fmt Mtd 21" NEMA 1 Gasketed
1	Bus Tie Transition
2	Maintenance Mode Beacon
2	A-B 1425-M8E PM5000 METERS

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Panelboards	42 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Copper Bus 10k AIC, 125A, 3P EDB Main Breaker(Bottom Fed), Surface Mounted			
		<b>Catalog No</b>	P1A225BB42CH12			
		<b>Designation</b>	53-PNL-01			
	<b>Qty</b>	<b>List of Materials</b>				
	1	125A, 3P EDB Main Breaker				
	14	20A 1P BAB Branch Breaker				
	1	40A, 2P BAB Branch Breaker				
	26	1P BAB Branch Provision Only				
	1	Copper Main BUS, 225 Amps				
	1	Std. Bolted Cu Ground Bar (Cu Cable Only)				
	1	Panel Nameplate - White with Black Letters				
	1	Type 12 Enclosure LWPQ2048				



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## Summary Bill of Material

Project Name: Tres Rios RV/RD Site Electrical Expansion C-432

Negotiation No: CU701101X8K1

General Order No:

Alternate No: 0000

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Panelboards	18 Circuits, 100A, Fully Rated, 120/240V 1Ph 3W, Copper Bus 10k AIC, 100A, EDB Main Breaker(Bottom Fed), Surface Mounted			

Catalog No P1C100BB16CH12  
Designation 53-PNL-02

### Qty List of Materials

- 1 100A, EDB Main Breaker
- 3 20A, 1P BAB Branch Breaker
- 10 1P BAB Branch Provision Only
- 1 Copper Main Bus, 100 Amps
- 1 Std. Bolted Cu Ground Bar (Cu Cable Only)
- 1 Panel Nameplate - White with Black Letters
- 1 Type 12 Enclosure LWPQ2036

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Dry Type Transformers	Transformer Type: General Purpose Vented 3 Phase, 45 KVA, 1 K-Factor 480 Primary Volts 208Y/120 Secondary Volts Temperature Rise 150C with 220C Insulation System Aluminum Winding Material Sound Reduction : 0 NEMA ST-20 Audible Sound Level: 45 Efficiency : DOE 10 CFR Part 431 (2016) UL Listed : Y Enclosure Type: NEMA 2 (N3R w/opt'l weathershield) Operating Frequency: 60 HZ			

Catalog No V48M20T4516  
Designation 53-TX-02

### Qty List of Materials

- 1 3 Phase, 45 KVA, 480 Primary Volts, 208Y/120 Secondary Volts, 150C with 220C Insulation System Temperature Rise, Aluminum Winding Material, 60 HZ
- 1 TRANSFORMER WEATHERSHIELD K.T FITS FRAME FR940
- 1 Transformer Lvg Kit 1PH 15-37 5KVA or 3PH 15-45KVA

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
	1	Safety Switches	Safety Switches			

Catalog No DH362FRK  
Designation 53-DSC-01B

### Qty List of Materials

- 1 Ground Lug Kit - DS100GK (Field Installed)
- 1 "R" Fuse Adapter Kit - DS26FK (Field Installed)
- 1 Heavy Duty Switch - Fusible, 3-Pole, 600 VAC, 60 A, NEMA 3F





Powering Business Worldwide

## Summary Bill of Material

Project Name: Tres Rios RWPD Site Electrical Expansion C-432

Negotiation No: TU701101X8K1

General Order No:

Alternate No: 0000

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
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Safety Switches  
Safety Switches  
Catalog No DH262FRK  
Designation SS-DSC-01A

Qty List of Materials  
1 Ground Lug Kit - DS100GK (Field Installed)  
1 1R Fuse Adapter Kit - DS26FK (Field Installed)  
1 Heavy Duty Switch - Fusible, 3-Pole, 600 VAC, 60 A, NEMA 3R

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
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PG Services  
Onsite UPS Startup 7x24  
Catalog No SU05NXXX-1800UC  
Designation UPS

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
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UPS - BladeUPS  
SUPER CHARGER MODULE ASSY 9PXM Eaton  
Catalog No 9PXMCHGR  
Designation UPS

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
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UPS - BladeUPS  
Battery Pack, 9PXM  
Catalog No 9PXMBA  
Designation UPS

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
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UPS - BladeUPS  
UPS 12kVA 6 Slot w/ 3 UPM, 6 Battery Pac  
Catalog No 9PXM8S12K  
Designation UPS

Item No.	Qty	Product	Description	Unit	Quote Price	Extended Quote
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Software and Connectivity  
Network Card-MS  
Catalog No NETWORK-MS  
Designation UPS

Eaton Selling Policy 25-000 applies.

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction thereof for the time the shipment is delayed.

Jon Lockhart

11/30/2018 11:34 AM

7777 E. paradise Ln STE 106  
Scottsdale, Arizona 85260  
Phone: (480) 991-9191  
Fax: (480) 483-7842  
E-Mail: Nicole@youngpower.com



## S&C Quote #196R1

To:	From: Nicole Barrett
Pages: 2	Date: Revised 10/28/18
Re: 84 Power Factor Correction	CC: Patrick Irwin

On behalf of S&C Electric Company, we are pleased to offer the following quotation based on the best interpretation of specification information provided at time of quote and is for S&C manual bulletin **665-31, 242-31**;

QTY Requesting (1) **Catalog #65152R1-A2-C3-E3-F1-K8**- 14.4kv, PME-9, 95 BIL, manual pad mounted gear with (6) end fittings #3093 and (6) SMU-20 Fuse (size TBD at time of order entry)

**A2** - Light Grey

**C3** - Key interlocks to prevent opening fuse termination-compartment doors unless all switches are locked open

**E3** - Fuse storage for 6 spares

**F1** - FCI provisions

**K8** - 12" base spacer

Any order or orders based on this quotation (1) are subject to acceptance by S&C Electric Company only at its general offices in Chicago, Illinois; (2) are subject to S&C Electric Company's standard conditions of sale, which are defined in full under "GENERAL" in the attached S&C Price Sheet 150; and (3) should be made out to:

S&C Electric Company  
C/o Young Power Equipment  
7777 E. paradise Ln STE 106  
Scottsdale, AZ 85260

The following are excerpts from the attached Price Sheet 150, "Standard Conditions of Sale", and dated September 29, 2014

Terms of Delivery. . . Prices are F.O.B. common carrier shipment point, with cheapest transportation prepaid to common carrier delivery point nearest first destination on orders with net value of \$5,000 or more. For orders with less than \$5,000 net value, prices are F.O.B. common carrier shipment point, freight collect or prepaid and added to the invoice.

**Ship:** 14-16 Weeks, ARO shipping on a Friday. Please allow 1 week for delivery  
**FOB:** Factory (IL), freight allowed over \$5,000  
**TERMS:** Net 30 days,  
**Valid:** 30 days, please reference quote number at time of order

Nicole Barrett