PELICAN BAY SERVICES DIVISION  
Municipal Service Taxing and Benefit Unit  

NOTICE OF PUBLIC MEETING  
JANUARY 3, 2019

THE CLAM BAY COMMITTEE OF THE PELICAN BAY SERVICES DIVISION WILL MEET AT 1:30 PM ON THURSDAY, JANUARY 3 AT THE PELICAN BAY SERVICES DIVISION, 3RD FLOOR OF THE SUNTRUST BUILDING, SUITE 302, LOCATED AT 801 LAUREL OAK DRIVE, NAPLES, FLORIDA 34108.

AGENDA

1. Roll call
2. Agenda approval
3. Approval of 11/08/18 meeting minutes
4. Audience comments
5. Clam Bay
   a. ETE annual report*
   b. Update on stressed mangroves near PBF north boardwalk
   c. Photos of rookery
   d. RFQ for Clam Bay monitoring
   e. Canoe trail marker 12
6. Clam Pass
   a. H&M annual bathymetric and tidal analysis report*
   b. November tidal ratio reports
   c. December aerial photos
   d. Upgraded modems and sensor repair for tidal gauges
   e. H&M draft of response to concerns about dredging
   f. Lead time for dredging decision to avoid BCC emergency action
7. Water quality
   a. Copper results
   b. Proposal for analyzing TP results from past decades
8. Annual Reports
   a. Water Quality due February 15, 2019
9. Next meeting: Feb. 7 or March 7
10. Adjournment

*The 2018 Clam Bay monitoring and bathymetric and tidal analysis reports are posted on the PBSD website. A hard copy will be made available upon request.
PELICAN BAY SERVICES DIVISION
CLAM BAY COMMITTEE MEETING
NOVEMBER 8, 2018

The Clam Bay Committee of the Pelican Bay Services Division met on Thursday, November 8 at 1:30 p.m. at the SunTrust Bank Building, 801 Laurel Oak Drive, Suite 302, Naples, Florida 34108. In attendance were:

Clam Bay Committee
Susan O’Brien, Chairman
Bohdan Hirniak (absent)
Rick Swider

Pelican Bay Services Division Staff
Neil Dorrill, Administrator
Marion Bolick, Operations Manager (absent)
Mary McCaughtry, Ops. Analyst (absent)
Lisa Jacob, Assoc. Project Manager
Barbara Shea, Recording Secretary

Also Present
Jennifer Bobka, Earth Tech
Tim Hall, Turrell, Hall & Assoc.
Mohamed Dabee, Humiston & Moore
Jeremy Sterk, Earth Tech
Kathy Worley, Conservancy of SW Florida

Kathy Worley, Conservancy of SW Florida

APPROVED AGENDA (AS AMENDED)

1. Roll call
2. Agenda approval
3. Approval of 09/06/18 meeting minutes
4. Audience comments
5. Clam Bay
   a. Update on monitoring
   b. Update on stressed mangroves near PBF north boardwalk
   c. THA assessment of debris removal and hand-dug channel maintenance
   d. Suggested changes to Scope of work for Clam Bay monitoring
   e. Canoe trail marker 12
6. Clam Pass
   a. H&M October tidal ratio report
   b. October aerial photos
   c. Impact of Hurricane Michael on Clam Pass
   d. Upgraded modems for tidal gauges
7. Water quality
   a. 3rd Quarter Clam Bay WQ results
   b. TP exceedances in 2nd Quarter report
   c. Copper results
   d. August WQ results from County Lab
   e. Changes in upland pond WQ testing and reporting
   f. Analyzing TP results from past decades
   g. Documenting rookery activity in annual WQ report
8. Review/update of the Clam Bay Management Plan
Pelican Bay Services Division Clam Bay Committee Meeting
November 8, 2018

8.5 New Business (add-on)
9. Annual Reports
   a. Clam Bay Tidal Analysis and Bathymetric reports due December 21, 2018
   b. Water Quality report due February 15, 2019
10. Next meeting: January 3, 2019
11. Adjournment

ROLL CALL
Mr. Hirniak was absent and a quorum was established

AGENDA APPROVAL
Ms. O’Brien motioned, Mr. Swider seconded to approve the agenda as amended, with the addition of item #8.5. The motion carried unanimously.

APPROVAL OF 09/06/18 MEETING MINUTES
Ms. O’Brien motioned, Mr. Swider seconded to approve the 09/06/18 meeting minutes as amended. The motion carried unanimously.

AUDIENCE COMMENTS
Ms. Kathy Worley, Conservancy of SW Florida, asked what the protocol would be to obtain permission to permanently install two “sediment elevation tables” in Clam Bay, which are stainless steel pipe instruments monitored over time to measure sediment accretion or erosion. This is one of the ways sea level rise can be monitored, and it can be determined whether the mangrove forest will “keep up” with sea level rise. Ms. Worley is working with U.S.G.S. (U.S. Geological Survey) and Rookery Bay on this project. The project would require no funding or action by the PBSD. The two instruments would be installed deep within the mangrove forest and would not be visible.

Mr. Dorrill suggested that Ms. Worley submit an e-mailed request for a license agreement including a sketch of the device, with a copy to Mr. Frank Laney, PBF Covenant Enforcement. The PBSD would then either include the request as an item on the consent agenda of a future Board of County Commissioners’ meeting or follow any other direction given by the County Manager’s Office.

CLAM BAY
UPDATE ON MONITORING
Mr. Sterk, Environmental Consultant with Earth Tech, provided data on his recent gopher tortoise survey which shows a stable tortoise population. He commented that his coastal scrub monitoring showed comparable data from 2017 to 2018, noting some increase in sea grape growth.

UPDATE ON STRESSED MANGROVES NEAR PBF NORTH BOARDWALK
Mr. Sterk provided an update on an area of stressed mangroves, located just south of the north boardwalk. He commented that he has added a few connections between hand-dug channels (in this area) to improve drainage which will hopefully reduce stress to these mangroves.
THE ASSESSMENT OF DEBRIS REMOVAL AND HAND-DUG CHANNEL MAINTENANCE

Mr. Hall, Environmental Consultant with Turrell, Hall and Assoc., provided his assessment/inspection report on the channel maintenance work conducted this year. He observed that a significant amount of vegetative debris was removed, and that the work completed was more comprehensive than in prior years.

SUGGESTED CHANGES TO SCOPE OF WORK FOR CLAM BAY MONITORING

Last year’s scope of work for Clam Bay monitoring was included in the agenda packet. The committee and staff discussed possible changes to the scope of work for the next contract, as Earth Tech’s contract expires in March 2019. Ms. Jacob suggested the following changes to the scope of work: (1) add additional mapping of hand-dug channels as part of Task 8 and (2) add “provide an infrared aerial photo and an RGB aerial photo” to Task 1. The committee discussed adding shorebird monitoring as additional monitoring of flora and fauna monitoring to Task 5.

Ms. Jacob suggested and the committee agreed that she would prepare a solicitation package for an RFP (request for proposal) for Clam Bay monitoring and environmental consulting services to meet our specific needs, for 3-5 years.

CANOE TRAIL MARKER 12

Mr. Sterk reported that he was informed by County staff that canoe trail marker 12 will be removed and disposed of next week.

CLAM PASS

H&M OCTOBER TIDAL RATIO RESULTS

Dr. Dabee commented that October tidal flow looks good, ratios are in the “safe range,” and inlet conditions look stable. He noted that tide gauge #4 is not working. Ms. Jacob commented that she has ordered a replacement sensor probe. Ms. O’Brien and Mr. Sterk suggested that the PBSD purchase two new sensors (one to store as a backup).

OCTOBER AERIAL PHOTOS & IMPACTS OF HURRICANE MICHAEL ON CLAM PASS

Dr. Dabee provided aerial photos of Clam Pass (taken at the end of October after Hurricane Michael) and commented that there is a lot of sand near shore and within the inlet mouth. He commented that (1) the inlet looks stable, (2) the channel is now “Y” shaped, and (3) he will continue to perform spot checks for annual monitoring.

Ms. Mary McClean Johnson asked about any escarpment on the beach. Dr. Dabee commented that Hurricane Irma caused a significant overwash of sand into the dune. A combination of this event along with the recent king tide and Hurricane Michael caused a super-elevation of sand on the PB South Beach. Dr. Dabee recommended no action be taken unless the escarpment becomes a public safety issue. He commented that if the escarpment is “knocked down,” then sand would be lost by moving it from the high berm into the water.

Mr. Hall commented that he is working on obtaining a DEP field permit which would allow for a PBF contractor to remove sand from under the PBF South Beach facility and place it in front of the escarpment.

UPGRADED MODEMS FOR TIDAL GAUGES
Ms. Jacob commented that the PBSD is purchasing new modems for the tide gauges. The activation by Locher Environmental will be delayed until the new modems and the new sensor probe are received and ready for installation (by ETE).

**WATER QUALITY**

**3RD QUARTER CLAM BAY WQ RESULTS INCLUDING TP EXCEEDANCES**

Dr. Tomasko, Environmental Consultant with ESA, provided the 3rd quarter Clam Bay water quality report (included in the agenda packet). Mr. Hall commented on the elevated phosphorus levels as well as higher nitrogen concentrations throughout the system. He suggested that this may be a result of the degradation of Hurricane Irma material and improvement in canal flow. He reported that Dr. Tomasko is working on a more detailed analysis.

**COPPER RESULTS**

Not discussed.

**AUGUST WQ RESULTS FROM COUNTY LAB**

Not discussed.

**CHANGES IN UPLAND POND WQ TESTING AND REPORTING**

Mr. Hall commented that Dr. Tomasko does not recommend the continuation of water quality testing in upland ponds. He noted that we are currently monitoring water quality at berm sites, and the input to Clam Bay is from the berm.

**ANALYZING TP RESULTS FROM PAST DECADES**

Mr. Hall commented that he will take a look at some historical data on Clam Bay phosphorus levels, to determine whether any trend exists.

**DOCUMENTING ROOKERY ACTIVITY IN ANNUAL WQ REPORT**

Mr. Hall suggested obtaining monthly drone photos of the rookery in Upper Clam Bay, from November to May, for documentation purposes.

Ms. Worley commented that the use of a drone above a rookery during bird breeding season is frowned upon by the environmental community. The birds see the drone as a predator and the noise disturbs them. She also commented that the rookery has existed for years, and therefore, could not be a new source of phosphorus.

Mr. Hall suggested getting a count of the birds roosting in the rookery for documentation purposes.

**BLUE TILAPIA EFFECTS ON WATER QUALITY**

Mr. Hall commented that he would seek Dr. Tomasko’s opinion on possible negative ecological impacts from installing blue tilapia in our lakes as a method to reduce algae.

**REVIEW/UPDATE OF THE CLAM BAY MANAGEMENT PLAN**

Mr. Dorrill commented on recent communications with Mr. Nick Casalanguida, Deputy County Manager, relating to perception issues pertaining to Clam Pass inlet dredging and the frequency of dredging over the past three years. He reported that the County Manager and Deputy
County Manager would like the PBSD to do an assessment/evaluation of whether alternative design templates could increase or sustain the intervals of dredging events.

Mr. Dorrill suggested that our response include a discussion that Clam Pass is influenced by wave energy and heights above three feet and that we have good science and weather data to support the system that we have. He suggested that we request a meeting with Mr. Casalanguida and/or Mr. Callahan, County Executive Director of Corp. Business Ops., to elaborate on the type of analysis/report being requested.

Ms. O’Brien suggested that the committee spend time to gather the appropriate documentation to share with the County Manager’s Office.

Dr. Dabees suggested that we provide (1) a 5-year evaluation of how the implementation compared to the design goals, and (2) provide data on the unusually inactive storm seasons from 2007 to 2012, followed by the active seasons from 2012 to 2018.

Mr. Dorrill suggested that Dr. Dabees develop a scope and sequence or outline as to what an appropriate response (and any necessary exhibits) should include, to be brought back for evaluation by the Clam Bay Committee. He also suggested that we talk to Commissioner Solis, show him our intentions for a Clam Bay Management Plan update, and obtain his ideas on how to proceed.

Ms. O’Brien suggested that the committee review a draft of Dr. Dabees’ analysis report at the next Clam Bay Committee meeting on Jan. 3.

Ms. Johnson commented on the frequent dredging events at Wiggins Pass and Doctors Pass.

Dr. Dabees commented on the series of events which lead up to a “trigger” of a dredging event. Once tidal ratios are sustained below .5, a bathymetric survey is completed to determine whether critical shoaling exists. If the survey indicates that physical conditions have become restrictive, then a dredging event is triggered.

Ms. Worley commented that Wiggins Pass and Doctors Pass are dredged for navigational purposes, while the goal of dredging Clam Pass is to keep the habitat healthy and minimize any environmental impacts.

NEW BUSINESS (ADD-ON)

Ms. Johnson asked whether the blue tilapia installed by the PBSD in PB lakes are genetically modified.

ANNUAL REPORTS

CLAM BAY TIDAL ANALYSIS AND BATHYMETRIC REPORTS DUE DECEMBER 21, 2018

Not discussed

WATER QUALITY REPORT DUE FEBRUARY 15, 2019

Not discussed

NEXT MEETING:

By consensus, the committee agreed that the next meeting of the committee would be held on January 3, 2019 at 1:30 p.m.

ADJOURNMENT
The meeting was adjourned at 3:25 p.m.

Susan O’Brien, Chairman

Minutes approved [___] as presented OR [___] as amended ON [_____________________] date
CLam Pass Tide Monitoring - Click here for Maintenance Dredging Project details

Monthly Time Series 2018 (Click on Thumbnails to Expand)

Mean Low Tide Time Lag - 2018

Gage/Gulf Mean Tide Ratios - 2018

Gage/Gulf Mean Tide Ratios - 2017

https://www.humistonandmoore.com/clampass-tide
Gage/Gulf Mean Tide Ratios - 2016

Definitions:

Mean Tide Ratio: ratio of tide amplitude of gages over the tide amplitude from the Gulf of Mexico, averaged over a month. This ratio is representative of the pass's effectiveness in flushing water from the bay. The lower the ratio, the less efficient is flushing, indicating material accumulating in the pass.

Mean Low Tide Lag: time difference between low tide in the Gulf of Mexico and at the gage's locations, averaged over a month in minutes. The time lag is also representative of the pass's effectiveness in flushing water from the bay. The higher the lag the less efficient is flushing, indicating material accumulating in the pass.

Background

Clam Pass is a small wave dominated inlet on the southwest coast of Florida that provides a tidal connection to 600 acres of the wetland preserve of Clam Bay Natural Resource Protection Area (NRPA). This preserve includes several interconnected bays surrounded by extensive areas of mangrove wetlands. The preserve is a pristine environmental resource that is collectively known as Clam Bay. Clam Pass has gone through periods of inlet migration as well as closure, because the relatively small tidal prism for Clam Bay provides critical balance between tidal energy and littoral process at the inlet channel.

Humiston & Moore Engineers provides professional engineering services to Pelican Bay Services Division of Collier County, Florida for Clam Pass and Clam Bay. Humiston & Moore Engineers provided engineering services to assist Turrell Hall & Associates in the development of the Clam Bay NRPA management plan of 1998 and the updated plan of 2014. The engineering services included the development of design criteria for the inlet stability and conditions for maintenance dredging to maintain hydraulic efficiency and avoid potential inlet closure including the implementation of the NRPA management plan includes various monitoring to maintain the health of the eco system. In addition to the ecological and biological monitoring of the bay system and its function as a protected environmental resource, the monitoring program includes hydraulic and physical monitoring of the inlet and bay system to monitor the stability of the pass and assess maintenance requirements. Monitoring of the hydraulic and physical conditions of the Clam Bay system continues according to the updated NRPA management plan. The hydraulic monitoring includes continuous water level and tidal data collection at 4 locations within the bay system.
December 21, 2018

Neil Dorrill,
Administrator
Collier County, Pelican Bay Services Division

REF: Scope of Work for Coastal Engineering Professional Services
    Review of Clam Pass Management Plan

Humiston & Moore Engineers proposes to provide the following Scope of Services to review the Clam Pass maintenance dredging program and evaluate the implementation of the 2015 update to Clam Bay NRPA Management Plan. The work will provide a review of the historic inlet dynamics, the maintenance dredging program to date, and the response of the inlet to dredging. This information will provide context for an assessment of the implementation of the 2015 NRPA Management Plan and maintenance dredging program. The assessment will identify long term trends in the system and provide recommendations for potential improvements to inlet management.

The Professional Services to be performed under this SOW include:

**Task 1:** Review of historic inlet dynamics and maintenance dredging program.
This task will compile representative historic datasets from Clam Pass and adjacent beaches to develop a long term perspective of the inlet and its response to dredging. The review and analysis of the inlet dynamics and maintenance dredging will begin with implementation of the 1999 Clam Bay NRPA Management Plan and consider the 2015 updates. The review will specifically include:
- Background of Clam Pass geometry, including 7 dredging events and monitoring surveys.
- Analysis of wave climate variability and tropical storms frequency.
- Analysis of the maintenance dredging template and history.
- Assessment of adjacent shoreline conditions and variability.
- Assessment of ebb shoal conditions and variability.

**Task 2:** Cost analysis of the maintenance dredging program.
This task will compile the dredging costs associated with the long term management of Clam Pass and provide context with regional inlets. The cost analysis will consider total costs, frequency of dredging, and quantity dredged, among other factors.

F:\Collier\300-C clam-Pass\2019-Evaluation\2019ClamPassPlanReview-SOW.docx
**Task 3:** Evaluation of past performance and recommended improvements

This task will provide analysis of the permitted dredging template and potential adjustments to improve the efficiency of the maintenance dredging program. The analysis will be based on documented inlet changes post dredging events and the evolution of the inlet geometry, adjacent shoreline and ebb shoal, and costs. This will provide the basis for recommendations of potential improvements to inlet management.

**Deliverable:** Progress meetings, presentations, and summary report

Sincerely,

HUMISTON & MOORE ENGINEERS

[Signature]

Mohamed Dabee, Ph.D., P.E., D.CE.
Vice President
of time between maintenance dredge events. He commented that there is a "perception issue" resulting from the process of frequent requests for approval of TDC funds on an emergency basis. He will discuss this issue again at the upcoming Clam Bay Committee and Budget Committee meetings.

Ms. O'Brien commented that these concerns have not been expressed at BCC or TDC meetings as recent as Spring 2018. She also commented that we could do a better job of improving our timeline (process of obtaining BCC and TDC approval, obtaining bids for the project, and completing the dredge event).

Dr. Ted Raia, representing the PBPOA and the Mangrove Action Group, commented on the history of dredging Clam Pass, and that dredging events are for the purpose of maintaining the health of the mangroves, not for the purposes of navigation or to obtain sand to benefit beaches.

**Ms. O’Brien motioned, Mr. Griffith seconded that the PBSD Board ask the Clam Bay Committee to explore the concerns raised by Mr. Casalanguida and bring a recommendation back to the PBSD Board. The motion carried unanimously.**

**UPDATE ON STREETLIGHT PROJECT AND SIGN BID AWARD**

Mr. Dorrill commented that the streetlight project has been awarded and the contractor is expected to begin work on Nov. 13, with an expected completion in 90 days.

Mr. Dorrill commented that the PBSD received four bids for our street sign replacement project, with AIS (American Infrastructure Services) being the lowest responsive bidder. The contract is being prepared and the expected award date is Dec. 11. The work may take up to a year to complete.

**US 41 BERM CLEAN-UP AND RESTORATION**

Mr. Dorrill commented that the plans and specifications for the US 41 berm landscape restoration project have been provided to the County Procurement Dept., who will prepare a project solicitation to be put out for bid, hopefully within 30 days.

**GULF PARK DRIVE MEDIAN-CUT CONSTRUCTION AND RE-STRIPIING**

Mr. Dorrill commented that the median-cut project is complete. He commented that the PBSD is in the process of obtaining Pelican Bay Foundation approval for new proposed signage which would restrict traffic on Gulf Park Dr. to a "right turn only" when exiting onto US 41. This issue will be discussed at the joint PBSD/PBF workshop on Nov. 12.

**BAY COLONY DUNE SWALE TOPOGRAPHIC SURVEY**

Mr. Dorrill commented that our engineer ABB has completed the Bay Colony beach dune swale topographic survey. The survey shows a large amount of sediment, willows, and mangroves in the swale. He commented that he will have a discussion of the construction drawings with the Water Management Committee at their next meeting.

**OAK LAKE SANCTUARY WEIR MODIFICATION**

Mr. Dorrill reported that we have received a SWM permit to effectuate the enlargement of the orifice at the weir adjacent to the Oak Lake Sanctuary community (to improve drainage). Quotes were received for the project, with Kyle Construction being the lowest responsive bidder for $12,625. Work will be scheduled when the lake level falls below the control elevation.
Neil,

Thank you for coming in today with Lisa. I wanted to recap the meeting so I can assign some tasks to our staff to keep our ideas moving. If I missed anything or if I am off a little with my notes, please let me know.

- **Maintenance Facility**
  - Goal is to develop a shared use facility master plan before the Christmas break and move that forward to be construction ready by the fall of 2019
  - Sean is going to coordinate a meeting with our facilities team so we establish a work team that can handle the details as we move forward

- **Sidewalks and Drainage**
  - Goal is to transition the sidewalks and drainage systems outside of the paved right of way to PBSO
    - Sidewalks are pretty straightforward
    - Drainage cutoff needs to be refined
  - Sean will work with GMD to get you a copy of our drainage cutoff plan in the next 30 days
    - You need a map of these locations and a spreadsheet identifying them
    - These exhibits will be used as a reference document in the transaction
  - PBSO was going to work on developing the financial plan

- **Clam Bay Management Plan**
  - This topic is going to be raised at the November PBSO meeting
  - Discussion will be had about reviewing historical methods of maintaining the pass with the more recent methods
  - The goal is to try and find common ground with the approach in order to manage stakeholder expectations with the need for a more sustainable maintenance plan
    - We need to avoid the annual emergency dredging as the agencies and the public are beginning to question the approach

I am going to ask Heather to get us together again in mid-December to maintain momentum on accomplishing these initiatives.

I also wanted to thank you for working with internal controls and ramping up the QA/QC program.

Respectfully,

Nick Casalanguida
Collier County, Deputy Manager
NickCasalanguida@CollierCounty.net
239-252-8383
<table>
<thead>
<tr>
<th>Collection Date</th>
<th>CB1</th>
<th>CB2</th>
<th>CB3</th>
<th>CB4</th>
<th>CB5</th>
<th>CB6</th>
<th>CB7</th>
<th>CB8</th>
<th>CB9</th>
<th>Report Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/22/2016</td>
<td>0.862</td>
<td>0.700</td>
<td>0.700</td>
<td>0.700</td>
<td>1.640</td>
<td>2.100</td>
<td>0.700</td>
<td>3.520</td>
<td>1.510</td>
<td>9/8/2016</td>
</tr>
<tr>
<td>9/20/2016</td>
<td>1.690</td>
<td>2.280</td>
<td>1.280</td>
<td>1.760</td>
<td>0.751</td>
<td>0.700</td>
<td>0.700</td>
<td>1.030</td>
<td>0.700</td>
<td>11/22/2016</td>
</tr>
<tr>
<td>10/12/2016</td>
<td>2.760</td>
<td>2.200</td>
<td>2.130</td>
<td>1.190</td>
<td>2.900</td>
<td>1.860</td>
<td>1.060</td>
<td>0.954</td>
<td>1.310</td>
<td>12/7/2016</td>
</tr>
<tr>
<td>11/9/2016</td>
<td>2.340</td>
<td>3.390</td>
<td>2.300</td>
<td>2.250</td>
<td>1.630</td>
<td>1.500</td>
<td>1.180</td>
<td>2.030</td>
<td>1.300</td>
<td>1/16/2017</td>
</tr>
<tr>
<td>12/6/2016</td>
<td>2.330</td>
<td>2.930</td>
<td>5.100</td>
<td>2.450</td>
<td>2.390</td>
<td>1.780</td>
<td>1.270</td>
<td>1.880</td>
<td>1.720</td>
<td>3/14/2017</td>
</tr>
<tr>
<td>1/19/2017</td>
<td>2.570</td>
<td>3.560</td>
<td>2.110</td>
<td>1.990</td>
<td>0.818</td>
<td>0.800</td>
<td>0.961</td>
<td>1.110</td>
<td>2.020</td>
<td>4/4/2017</td>
</tr>
<tr>
<td>2/23/2017</td>
<td>2.510</td>
<td>3.350</td>
<td>1.600</td>
<td>1.120</td>
<td>0.051</td>
<td>0.948</td>
<td>1.500</td>
<td>2.570</td>
<td>2.600</td>
<td>4/24/2017</td>
</tr>
<tr>
<td>3/21/2017</td>
<td>7.970</td>
<td>4.080</td>
<td>1.710</td>
<td>1.120</td>
<td>0.894</td>
<td>0.846</td>
<td>1.080</td>
<td>1.093</td>
<td>0.957</td>
<td>6/1/2017</td>
</tr>
<tr>
<td>4/18/2017</td>
<td>6.480</td>
<td>8.160</td>
<td>1.620</td>
<td>1.240</td>
<td>0.800</td>
<td>0.956</td>
<td>1.280</td>
<td>1.010</td>
<td>1.100</td>
<td>6/14/2017</td>
</tr>
<tr>
<td>5/24/2017</td>
<td>2.840</td>
<td>4.060</td>
<td>4.990</td>
<td>0.800</td>
<td>0.800</td>
<td>0.959</td>
<td>0.800</td>
<td>0.920</td>
<td>0.946</td>
<td>7/6/2017</td>
</tr>
<tr>
<td>6/21/2017</td>
<td>3.840</td>
<td>4.240</td>
<td>3.850</td>
<td>0.906</td>
<td>1.200</td>
<td>1.140</td>
<td>1.260</td>
<td>1.110</td>
<td>0.760</td>
<td>8/8/2017</td>
</tr>
<tr>
<td>8/14/2017</td>
<td>4.290</td>
<td>3.810</td>
<td>3.240</td>
<td>2.650</td>
<td>1.400</td>
<td>1.220</td>
<td>1.470</td>
<td>1.020</td>
<td>0.700</td>
<td>10/10/2017</td>
</tr>
<tr>
<td>9/4/2017</td>
<td>2.680</td>
<td>1.270</td>
<td>0.600</td>
<td>0.800</td>
<td>12.600</td>
<td>1.610</td>
<td>0.600</td>
<td>0.600</td>
<td>1/22/2018</td>
<td></td>
</tr>
<tr>
<td>11/28/2017</td>
<td>0.700</td>
<td>0.722</td>
<td>2.540</td>
<td>0.700</td>
<td>0.700</td>
<td>0.700</td>
<td>0.700</td>
<td>0.700</td>
<td>0.700</td>
<td>1/22/2018</td>
</tr>
<tr>
<td>12/12/2017</td>
<td>1.780</td>
<td>2.250</td>
<td>1.880</td>
<td>0.700</td>
<td>1.210</td>
<td>1.210</td>
<td>1.300</td>
<td>0.728</td>
<td>0.911</td>
<td>3/26/2018</td>
</tr>
<tr>
<td>1/8/2018</td>
<td>0.420</td>
<td>1.510</td>
<td>1.660</td>
<td>1.590</td>
<td>0.800</td>
<td>0.809</td>
<td>0.800</td>
<td>0.800</td>
<td>2.400</td>
<td>4/27/2018</td>
</tr>
<tr>
<td>2/6/2018</td>
<td>3.400</td>
<td>3.980</td>
<td>2.130</td>
<td>2.420</td>
<td>0.829</td>
<td>1.640</td>
<td>3.920</td>
<td>0.800</td>
<td>0.800</td>
<td>4/30/2018</td>
</tr>
<tr>
<td>5/8/2018</td>
<td>5.490</td>
<td>4.880</td>
<td>2.360</td>
<td>1.090</td>
<td>0.800</td>
<td>1.050</td>
<td>1.270</td>
<td>1.570</td>
<td>1.640</td>
<td>7/2/2018</td>
</tr>
<tr>
<td>6/6/2018</td>
<td>3.120</td>
<td>3.320</td>
<td>2.670</td>
<td>0.800</td>
<td>0.800</td>
<td>0.853</td>
<td>0.828</td>
<td>1.080</td>
<td>1.220</td>
<td>7/18/2018</td>
</tr>
<tr>
<td>7/17/2018</td>
<td>1.400</td>
<td>1.440</td>
<td>1.600</td>
<td>1.600</td>
<td>2.270</td>
<td>1.600</td>
<td>1.600</td>
<td>1.600</td>
<td>1.600</td>
<td>8/21/2018</td>
</tr>
<tr>
<td>8/15/2018</td>
<td>1.500</td>
<td>1.410</td>
<td>1.400</td>
<td>1.400</td>
<td>1.600</td>
<td>1.600</td>
<td>1.600</td>
<td>1.600</td>
<td>1.600</td>
<td>10/8/2018</td>
</tr>
<tr>
<td>9/13/2018</td>
<td>1.720</td>
<td>1.960</td>
<td>1.200</td>
<td>1.400</td>
<td>1.400</td>
<td>1.400</td>
<td>1.400</td>
<td>1.400</td>
<td>1.400</td>
<td>10/9/2018</td>
</tr>
<tr>
<td>10/15/2018</td>
<td>3.190</td>
<td>4.800</td>
<td>4.400</td>
<td>4.030</td>
<td>1.400</td>
<td>1.400</td>
<td>1.960</td>
<td>1.400</td>
<td>1.400</td>
<td>12/21/2018</td>
</tr>
</tbody>
</table>