



# ETC Engineers & Architects, Inc.

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May 10, 2018

Mr. Layne Pemberton  
Enforcement Analyst  
Enforcement Branch  
ADEQ Office of Water Quality  
5301 Northshore Drive  
North Little Rock, AR 72118

Ref: City of Forrest City; Permit No.: AR0020087  
Your letter Dated March 22, 2018

Dear Mr. Pemberton,

The Consent Administrative Order (CAO) recently signed by the City of Forrest City included 6 effluent violations. One of the violations relate to Ammonia Nitrogen effluent limits. In compliance with the requirements of the CAO, the undersigned on behalf the Forrest City Water Utility (FCWU) submitted a report on Best Management Practice (BMP) for nutrient reduction. On a subsequent letter dated January 17, 2018 I submitted a Corrective Action Plan on various effluent violations. In that letter I provided the likely reasons for the Ammonia Nitrogen effluent limits violation during May 2016. Excerpt from that letter relating to the Ammonia Nitrogen violation is as follows:

2. Nitrogen/Ammonia Total:

- a. FCWU violated total Nitrogen/Ammonia permit limit only on one occasion during the last three years. The violation took place during the reporting period 5/1/2016 to 5/31/2016. The violation exceeded the permit limit by 10% only.
- b. FCWU submitted a non-compliance report on the violations (see attachment FC-3).
- c. The noncompliance report submitted by FCWU described the probable cause for the violation. In the opinion of the FCWU staff, the violation was caused by imbalance in the sludge depth ratio in the Clarifier #1.
- d. The sludge depth ratio imbalance was the result of clogged RAS suction line from Clarifier #1.
- e. The corrective action taken by FCWU was to drain and clean Clarifier #1 along with the RAS line. The Clarifier #1 was subsequently put back into operation. It has been functioning normally since then.
- f. There have been no reported Nitrogen/Ammonia violations since then.
- g. In conclusion, I see no need for any immediate additional corrective actions. FCWU will monitor discharge quality of the Nitrogen/Ammonia on a continual basis.
- h. FCWU will adopt scheduled and preventive operation and maintenance procedures to avoid any future similar occurrence thereby avoid any permit violation."

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Since then I have obtained effluent test results for Ammonia Nitrogen for the period of April 2016 through April 2018. All available data are shown in the attached spreadsheet (See Attachment). Red colored days indicate plant effluent values exceeded maximum weekly and/or monthly permit limits. List of ammonia level exceeding the permit level on a weekly and monthly basis are as follows:

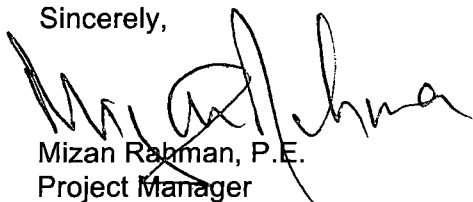
2018: 0 Time  
2017: 0 Time  
2016: 1 Time in May (As stated above)

Based on the above findings it appears that during the entire period since the May 2016 incident, FCWWTP has not violated the permit limits related to Ammonia Nitrogen. From this we could conclude that the May 2016 violation was an isolated incident and happened due to the reasons stated earlier.

Forrest City WWTP employs Activated Sludge treatment process to treat its domestic wastewater. FCWWTP is a conventional activated sludge treatment process and was not designed to reduce nutrient load. Conventional Activated sludge treatment processes are typically designed and operated with a focus on BOD and TSS removal. Nitrogen and phosphorus removal in those processes predominantly occurs from the nutrients being assimilated into the cell biomass during microbial (net) growth. Approximately 1 mg of phosphorus removal and 5 mg of nitrogen removal can be expected per 100 mg of BOD reduced in the system. As a result, overall nutrient removal in conventional activated sludge treatment processes is typically relatively low. Average nitrogen removal is 37.5% (based on average influent TKN of 40) and Phosphorus removal is 20% (based on average influent TP of 7). However, research has shown that controlling air supply to the influent area can enhance the nutrient removal efficiency of the process. To increase nutrient removal efficiency FCWWTP controls and monitors DO level to 2 mg/l in the influent area so as to create an anoxic zone. It appears that the controlled air supply to the influent area does help FCWWTP meet the nutrient effluent limits.

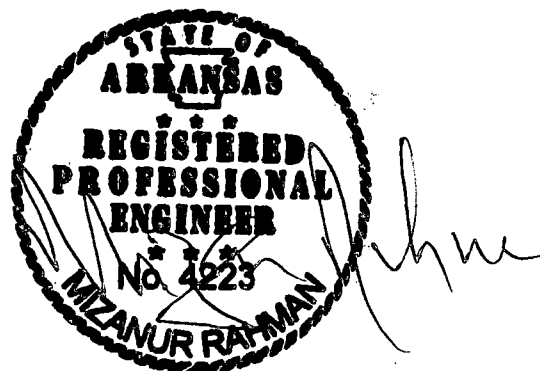
FCWU will continue to monitor the FCWWTP effluent for ammonia nitrogen permit limits as required by the NPDES permit and will report any violation as and when it happens. However, I request that you consider this CAO item has been satisfactorily complied by the FCWU. Please feel free to contact me if you have any question or need additional clarification.

Sincerely,



Mizan Rahman, P.E.  
Project Manager

Attachments



## Forrest City Wastewater Treatment Plant Analysis of Effluent Ammonia Test Results (mg/L)

Date	Lab Reference No.	Ammonia (as Nitrogen) (mg/l)	Violations Permit Limit (Apr-Oct: Monthly Avg. : 2.1 mg/l & 7 D Avg: 4.5 mg/l; Nov - Mar: Monthly Avg- 3.0 & 7 D Avg: 4.5 mg/l)	Monthly Graph
<b>Apr-18</b>	4/24/18	1804010354	< 0.01	0 Weekly Violation
	4/20/18	1804010330	0.07	
	4/19/18	1804010312	0.08	0 Weekly Violation
	4/17/18	1804010270	0.07	
	4/13/18	1804010234	0.12	
	4/12/18	1804010196	0.14	0 Weekly Violation
	4/10/18	1804010173	0.06	
	4/6/18	1804010137	0.83	
	4/5/18	1804010086	0.23	0 Weekly Violation
	4/3/18	1804010044	0.04	
<b>Monthly Average</b>		<b>0.17</b>	<b>0 Monthly Violation</b>	
<b>Mar-18</b>	3/30/18	1803010319	2.97	
	3/29/18	1803010317	< 0.01	0 Weekly Violation
	3/27/18	1803010300	0.15	
	3/23/18	1803010287	0.03	
	3/22/18	1803010285	0.03	0 Weekly Violation
	3/20/18	1803010257	0.05	
	3/16/18	1803010233	0.19	0 Weekly Violation
	3/15/18	1803010214	0.04	
	<b>Monthly Average</b>		<b>0.43</b>	<b>0 Monthly Violation</b>
<b>Feb-18</b>	2/9/18	1802010250	0.04	
	2/8/18	1802010216	0.05	0 Weekly Violation
	2/6/18	1802010169	1.75	
	2/2/18	1802010101	0.06	0 Weekly Violation
	2/1/18	1802010050	0.02	
	<b>Monthly Average</b>		<b>0.38</b>	<b>0 Monthly Violation</b>
<b>Jan-18</b>	1/30/18	1801010343	0.06	0 Weekly Violation
	1/26/18	1801010334	1	
	1/25/18	1801010332	0.93	0 Weekly Violation
	1/23/18	1801010310	0.23	
	1/19/18	1801010288	0.04	
	1/18/18	1801010269	0.16	0 Weekly Violation
	1/17/18	1801010238	< 0.1	
	1/12/18	1801010205	0.06	
	1/11/18	1801010178	0.07	0 Weekly Violation
	1/9/18	1801010154	0.06	
	1/5/18	1801010110	0.06	
1/4/18	1801010057	0.03	0 Weekly Violation	
1/2/18	1801010021	0.04		
<b>Monthly Average</b>		<b>0.22</b>	<b>0 Monthly Violation</b>	
<b>Dec-17</b>	12/29/17	1712010290	0.04	
	12/28/17	1712010285	0.09	0 Weekly Violation
	12/27/17	1712010272	0.04	
	12/21/17	1712010254	0.04	
	12/20/17	1712010240	0.03	0 Weekly Violation
	12/19/17	1712010232	0.04	
	12/15/17	1712010215	< 0.1	
	12/14/17	1712010191	< 0.1	0 Weekly Violation
	12/12/17	1712010181	< 0.1	
	12/8/17	1712010124	0.05	
	12/7/17	1712010085	0.04	0 Weekly Violation
	12/5/17	1712010048	0.06	
	12/1/17	1712010008	0.03	0 Weekly Violation
<b>Monthly Average</b>		<b>0.06</b>	<b>0 Monthly Violation</b>	
<b>Nov-17</b>	11/30/17	1711010282	0.32	
	11/28/17	1711010276	< 0.01	0 Weekly Violation
	11/22/17	1711010265	0.03	
	11/21/17	1711010256	0.08	0 Weekly Violation

## Forrest City Wastewater Treatment Plant Analysis of Effluent Ammonia Test Results (mg/L)

	Date	Lab Reference No.	Ammonia (as Nitrogen) (mg/l)	Violations Permit Limit (Apr-Oct: Monthly Avg. : 2.1 mg/l & 7 D Avg: 4.5 mg/l; Nov - Mar: Monthly Avg- 3.0 & 7 D Avg: 4.5 mg/l)	Monthly Graph
<b>Nov-17</b>	11/20/17	1711010264	0.54	0 Weekly Violation	
	11/17/17	1711010235	0.05		
	11/16/17	1711010219	0.17		
	11/14/17	1711010208	0.06		
	11/10/17	1711010169	0.08		
	11/9/17	1711010143	0.1		
	11/7/17	1711010113	0.15		
	11/3/17	1711010069	0.08		
	11/2/17	1711010023	0.14		
	<b>Monthly Average</b>				
<b>Oct-17</b>	10/31/17	1710010390	0.24	0 Weekly Violation	
	10/27/17	1710010384	< 0.01		
	10/26/17	1710010368	< 0.1		
	10/24/17	1710010350	0.01		
	10/20/17	1710010333	0.02		
	10/19/17	1710010320	0.01		
	10/17/17	1710010288	0.04		
	10/13/17	1710010245	0.05		
	10/12/17	1710010215	0.02		
	10/9/17	1710010192	0.01		
	10/6/17	1710010166	0.03		
	10/5/17	1710010090	0.01		
10/3/17	1710010081	< 0.1			
<b>Monthly Average</b>			<b>0.05</b>	<b>0 Monthly Violation</b>	
<b>Sep-17</b>	9/29/17	1709010259	0.01	0 Weekly Violation	
	9/28/17	1709010258	0.06		
	9/26/17	1709010243	< 0.1		
	9/22/17	1709010234	< 0.01		
	9/21/17	1709010216	0.02		
	9/21/17	1709010216	0.02		
	9/19/17	1709010192	0.02		
	9/15/17	1709010167	0.04		
	9/14/17	1709010145	< 0.01		
	9/12/17	1709010123	< 0.01		
	9/8/17	1709010096	0.03		
	9/7/17	1709010051	0.04		
	9/5/17	1709010024	0.05		
9/1/17	1709010006	0.09			
<b>Monthly Average</b>			<b>0.04</b>	<b>0 Monthly Violation</b>	
<b>Aug-17</b>	8/31/17	1708010302	0.05	0 Weekly Violation	
	8/30/17	1708010297	< 0.1		
	8/25/17	1708010289	< 0.1		
	8/24/17	1708010273	< 0.1		
	8/22/17	1708010255	0.04		
	8/18/17	1708010238	0.18		
	8/17/17	1708010220	0.01		
	8/15/17	1708010195	< 0.01		
	8/11/17	1708010170	0.08		
	8/10/17	1708010143	0.01		
	8/8/17	1708010120	0.02		
	8/4/17	1708010368	0.01		
	8/3/17	1708010051	0.01		
8/1/17	1708010020	< 0.01			
<b>Monthly Average</b>			<b>0.05</b>	<b>0 Monthly Violation</b>	
	7/28/17	1707010312	< 0.01	0 Weekly Violation	
	7/27/17	1707010311	< 0.01		
	7/25/17	1707010290	0.07		
	7/21/17	1707010265	0.02		

## Forrest City Wastewater Treatment Plant Analysis of Effluent Ammonia Test Results (mg/L)

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<b>Jul-17</b>	7/20/17	1707010249	0.02	0 Weekly Violation	
	7/18/17	1707010217	0.01		
	7/14/17	1707010171	< 0.01		
	7/13/17	1707010136	0.02		
	7/11/17	1707010113	0.05		
	7/7/17	1707010078	0.01		
	7/6/17	1707010028	0.1		
	7/5/17	1707010027	0.1		
<b>Monthly Average</b>			<b>0.04</b>	<b>0 Monthly Violation</b>	
<b>Jun-17</b>	6/30/17	1706010267	0.02	0 Weekly Violation	
	6/29/17	1706010268	0.01		
	6/28/17	1706010252	0.02		
	6/23/17	1706010241	0.01		
	6/22/17	1706010239	0.02		
	6/20/17	1706010213	0.14		
	6/16/17	1706010194	0.02		
	6/15/17	1706010179	0.02		
	6/13/17	1706010159	0.11		
	6/9/17	1706010135	0.09		
	6/8/17	1706010112	< 0.01		
	6/8/17	1706010381	0.17		
	6/6/17	1706010078	0.02		
6/2/17	1706010046	< 0.01			
6/1/17	1706010001	< 0.10			
<b>Monthly Average</b>			<b>0.05</b>	<b>0 Monthly Violation</b>	
<b>May-17</b>	5/31/17	1705010362	0.02	0 Weekly Violation	
	5/26/17	1705010354	< 0.01		
	5/25/17	1705010341	0.02		
	5/23/17	1705010320	0.02		
	5/19/17	1705010303	< 0.01		
	5/18/17	1705010281	0.01		
	5/16/17	1705010244	0.02		
	5/12/17	1705010220	0.05		
	5/11/17	1705010192	0.02		
	5/9/17	1705010169	0.08		
	5/5/17	1705010140	0.19		
	5/4/17	1705010367	0.18		
5/2/17	1705010090	0.12			
<b>Monthly Average</b>			<b>0.06</b>	<b>0 Monthly Violation</b>	
<b>Apr-17</b>	4/28/17	1704010370	0.07	0 Weekly Violation	
	4/27/17	1704010368	< 0.1		
	4/25/17	1704010343	< 0.1		
	4/21/17	1704010322	0.03		
	4/20/17	1704010305	0.04		
	4/18/17	1704010256	0.04		
	4/14/17	1704010215	0.06		
	4/13/17	1704010179	0.04		
	4/11/17	1704010158	0.02		
	4/7/17	1704010123	< 0.01		
	4/6/17	1704010081	< 0.01		
4/4/17	1704010042	0.13			
<b>Monthly Average</b>			<b>0.05</b>	<b>0 Monthly Violation</b>	
<b>Mar-17</b>	3/31/17	1703010311	0.02	0 Weekly Violation	
	3/30/17	1703010309	0.01		
	3/28/17	1703010300	0.06		
	3/24/17	1703010287	0.08		
	3/23/17	1703010314	0.01		
3/21/17	1703010267	0.05			

## Forrest City Wastewater Treatment Plant Analysis of Effluent Ammonia Test Results (mg/L)

Date	Lab Reference No.	Ammonia (as Nitrogen) (mg/l)	Violations Permit Limit (Apr-Oct: Monthly Avg. : 2.1 mg/l & 7 D Avg: 4.5 mg/l; Nov - Mar: Monthly Avg- 3.0 & 7 D Avg: 4.5 mg/l)	Monthly Graph
<b>Mar-17</b>	3/17/17	1703010244	0.03	
	3/16/17	1703010224	0.07	
	3/14/17	1703010199	0.04	
	3/10/17	1703010169	< 0.1	
	3/9/17	1703010139	0.14	
	3/7/17	1703010107	0.04	
	3/3/17	1703010064	0.13	
	3/2/17	1703010024	0.15	
<b>Monthly Average</b>		<b>0.07</b>	<b>0 Monthly Violation</b>	
<b>Feb-17</b>	2/28/17	1702010342	0.05	
	2/24/17	1702010324	0.11	
	2/23/17	1702010293	0.02	
	2/21/17	1702010270	0.24	
	2/17/17	1702010246	0.14	
	2/16/17	1702010228	0.12	
	2/14/17	1702010203	0.07	
	2/10/17	1702010170	0.14	
	2/9/17	1702010144	0.09	
	2/7/17	1702010116	0.08	
	2/3/17	1702010071	0.08	
	2/2/17	1702010031	0.11	
2/2/17	1702010031	0.11		
<b>Monthly Average</b>		<b>0.10</b>	<b>0 Monthly Violation</b>	
<b>Jan-17</b>	1/31/17	1701010366	0.15	
	1/27/17	1701010358	0.05	
	1/26/17	1701010356	0.13	
	1/24/17	1701010347	0.13	
	1/20/17	1701010325	0.04	
	1/19/17	1701010306	0.03	
	1/17/17	1701010276	0.08	
	1/13/17	1701010251	0.1	
	1/12/17	1701010221	0.14	
	1/10/17	1701010199	0.24	
	1/6/17	1701010168	0.15	
	1/5/17	1701010124	0.11	
1/3/17	1701010085	0.01		
<b>Monthly Average</b>		<b>0.10</b>	<b>0 Monthly Violation</b>	
<b>Dec-16</b>	12/30/16	1612010278	0.09	
	12/29/16	1612010276	0.1	
	12/28/16	1612010261	0.13	
	12/28/16	1612010261	0.13	
	12/23/16	1612010249	0.09	
	12/22/16	1612010247	0.11	
	12/21/16	1612010226	0.04	
	12/16/16	1612010205	0.07	
	12/15/16	1612010187	0.06	
	12/13/16	1612010167	0.07	
	12/9/16	1612010140	0.05	
	12/8/16	1612010113	0.04	
	12/6/16	1612010081	0.03	
	12/2/16	1612010044	0.03	
<b>Monthly Average</b>		<b>0.07</b>	<b>0 Monthly Violation</b>	
<b>Nov-16</b>	11/30/16	1612010005	0.03	
	11/29/16	1611010372	0.03	
	11/22/16	1611010353	0.09	
	11/22/16	1611010367	0.04	
	11/21/16	1611010331	0.02	
	11/18/16	1611010313	0.05	
<b>Monthly Average</b>		<b>0.04</b>	<b>0 Monthly Violation</b>	

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Date	Lab Reference No.	Ammonia (as Nitrogen) (mg/l)	Violations Permit Limit (Apr-Oct: Monthly Avg. : 2.1 mg/l & 7 D Avg: 4.5 mg/l; Nov - Mar: Monthly Avg- 3.0 & 7 D Avg: 4.5 mg/l)	Monthly Graph
<b>Nov-16</b>	11/18/16	1611010313	0.05	0 Weekly Violation
	11/17/16	1611010295	0.11	
	11/15/16	1611010260	0.06	
	11/11/16	1611010234	0.05	
	11/10/16	1611010205	0.06	
	11/8/16	1611010184	0.28	
	11/3/16	1611010101	0.05	
	11/3/16	1611010147	< 0.01	
	11/1/16	1611010067	0.05	
<b>Monthly Average</b>		<b>0.07</b>	<b>0 Monthly Violation</b>	
<b>Oct-16</b>	10/28/16	1610010333	0.17	0 Weekly Violation
	10/27/16	1610010331	0.22	
	10/25/16	1610010314	0.04	
	10/21/16	1610010295	0.1	
	10/20/16	1610010272	0.05	
	10/18/16	1610010238	0.02	
	10/14/16	1610010143	0.25	
	10/13/16	1610010102	0.28	
	10/11/16	1610010084	0.45	
	10/7/16	1610010059	0.42	
	10/6/16	1610010151	0.33	
10/4/16	1610010020	0.08		
<b>Monthly Average</b>		<b>0.20</b>	<b>0 Monthly Violation</b>	
<b>Sep-16</b>	9/30/16	1609010272	0.01	0 Weekly Violation
	9/29/16	1609010270	0.02	
	9/27/16	1609010253	0.02	
	9/23/16	1609010243	0.44	
	9/22/16	1609010240	0.48	
	9/20/16	1609010218	0.18	
	9/16/16	1609010198	0.63	
	9/15/16	1609010177	0.59	
	9/13/16	1609010155	0.05	
	9/9/16	1609010129	0.17	
	9/8/16	1609010099	0.05	
	9/6/16	1609010071	< 0.01	
	9/2/16	1609010291	0.01	
9/1/16	1609010001	0.01		
<b>Monthly Average</b>		<b>0.19</b>	<b>0 Monthly Violation</b>	
<b>Aug-16</b>	8/31/16	1608010242	0.01	0 Weekly Violation
	8/26/16	1608010235	0.02	
	8/25/16	1608010217	0.03	
	8/23/16	1608010201	0.02	
	8/19/16	1608010187	< 0.01	
	8/18/16	1608010180	0.02	
	8/16/16	1608010158	0.02	
	8/11/16	1608010120	0.03	
	8/11/16	1608010141	0.02	
	8/9/16	1608010101	0.04	
	8/5/16	1608010079	0.06	
	8/4/16	1608010043	0.09	
	8/2/16	1608010023	0.05	
<b>Monthly Average</b>		<b>0.03</b>	<b>0 Monthly Violation</b>	
<b>6</b>	7/29/16	1607010610	< 0.1	0 Weekly Violation
	7/28/16	1607010457	< 0.1	
	7/26/16	1607010437	0.13	
	7/22/16	1607010332	0.11	
	7/21/16	1607010323	0.02	
	7/19/16	1607010293	0.25	

## Forrest City Wastewater Treatment Plant Analysis of Effluent Ammonia Test Results (mg/L)

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<b>Jul-16</b>	7/15/16	1607010198	0.23	
	7/14/16	1607010167	0.15	
	7/12/16	1607010140	0.07	
	7/8/16	1607010107	0.24	
	7/7/16	1607010064	0.08	
	7/5/16	1607010029	0.06	
	7/1/16	1607010008	0.06	
<b>Monthly Average</b>		<b>0.12</b>	<b>0 Monthly Violation</b>	
<b>Jun-16</b>	6/30/16	1606010470	0.15	
	6/29/16	1606010483	0.05	
	6/24/16	1606010453	0.06	
	6/23/16	1606010420	0.06	
	6/21/16	1606010401	0.03	
	6/17/16	1606010260	0.05	
	6/16/16	1606010247	0.06	
	6/14/16	1606010220	0.15	
	6/10/16	1606010174	0.15	
	6/9/16	1606010155	0.08	
	6/7/16	1606010130	< 0.1	
	6/3/16	1606010072	0.13	
6/2/16	1606010036	0.13		
<b>Monthly Average</b>		<b>0.09</b>	<b>0 Monthly Violation</b>	
<b>May-16</b>	5/31/16	1605010441	0.04	
	5/27/16	1605010431	0.06	
	5/26/16	1605010415	0.04	
	5/26/16	1605010415	0.04	
	5/24/16	1605010392	0.11	
	5/20/16	1605010322	0.11	
	5/19/16	1605010309	0.05	
	5/17/16	1605010286	0.02	
	5/13/16	1605010202	0.13	
	5/12/16	1605010176	0.2	
	5/10/16	1605010152	0.22	
	5/6/16	1605010114	<b>7.5</b>	
5/5/16	1605010073	<b>5.98</b>		
5/3/16	1605010041	<b>0.97</b>		
<b>Monthly Average</b>		<b>1.19</b>	<b>0 Monthly Violation</b>	
<b>Apr-16</b>	4/29/16	1604010574	< 0.1	
	4/28/16	1604010564	0.2	
	4/26/16	1604010541	< 0.1	
	4/22/16	1604010494	0.15	
	4/22/16	1604010494	0.15	
	4/21/16	1604010484	5.04	
	4/19/16	1604010443	2.34	
	4/15/16	1604010377	< 0.1	
	4/14/16	1604010338	< 0.1	
	4/12/16	1604010295	< 0.1	
	4/8/16	1604010148	< 0.1	
	4/7/16	1604010103	< 0.1	
	4/5/16	1604010062	< 0.1	
4/1/16	1604010004	0.14		
<b>Monthly Average</b>		<b>0.63</b>	<b>0 Monthly Violation</b>	



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