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Header 2

List View

General Information | Contact | Default Values | Discount | Document Information | Clarification Request

Procurement Folder: 1955961
Procurement Type: Central Master Agreement
Vendor ID: VS0000013178
Legal Name: AMD INDUSTRIES INC
Alias/DBA:
Total Bid: $543,600.00
Response Date: 07/01/2026
Response Time: 13:24
Responded By User ID: AMD
First Name: John
Last Name: DeFranco
Email: john@amdindustriesinc.con
Phone: 7249382657

SO Doc Code: CRFQ
SO Dept: 0313
SO Doc ID: DEP2600000039
Published Date: 6/17/26
Close Date: 7/7/26
Close Time: 13:30
Status: Closed
Solicitation Description: OSR Polymer - Open End
Total of Header Attachments: 2
Total of All Attachments: 2

Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia
Solicitation Response

Proc Folder:	1955961
Solicitation Description:	OSR Polymer - Open End
Proc Type:	Central Master Agreement

Solicitation Closes	Solicitation Response	Version
2026-07-07 13:30	SR 0313 ESR07012600000000030	1

VENDOR

VS0000013178
AMD INDUSTRIES INC

Solicitation Number: CRFQ 0313 DEP2600000039

Total Bid: 543600 **Response Date:** 2026-07-01 **Response Time:** 13:24:00

Comments: Our delivered anionic emulsion polymer price is $1.60/lbs and our delivered cationic emulsion polymer price is $2.00/lbs.
We submitted the treatability report using both the cationic and anionic polymers and sent the required 1.0 gallon sample of both polymers to the Office of Special Reclamation Philippi office.

FOR INFORMATION CONTACT THE BUYER
Joseph (Josh) E Hager III
(304) 558-2306
joseph.e.hageriii@wv.gov

Vendor Signature X **FEIN#** **DATE**

All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Cationic Emulsion Polymer - Clay County	10000.000	LB	2.000000	20000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Cationic Emulsion Polymer Price is $2.00/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Cationic Emulsion Polymer - Clay County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
2	Cationic Emulsion Polymer - Grant County	15000.000	LB	2.000000	30000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Cationic Emulsion Polymer Price is $2.00/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Cationic Emulsion Polymer - Grant County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
3	Cationic Emulsion Polymer - Marion County	70000.000	LB	2.000000	140000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Cationic Emulsion Polymer Price is $2.00/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Cationic Emulsion Polymer - Marion County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
4	Cationic Emulsion Polymer - Mineral County	3000.0000	LB	2.000000	6000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Cationic Emulsion Polymer Price is $2.00/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Cationic Emulsion Polymer - Mineral County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
5	Cationic Emulsion Polymer - Monongalia County	18000.000	LB	2.000000	36000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Cationic Emulsion Polymer Price is $2.00/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Cationic Emulsion Polymer - Monongalia County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
6	Cationic Emulsion Polymer - Preston County	30000.000	LB	2.000000	60000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Cationic Emulsion Polymer Price is $2.00/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Cationic Emulsion Polymer - Preston County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
7	Cationic Emulsion Polymer - Upshur County	5000.0000	LB	2.000000	10000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Cationic Emulsion Polymer Price is $2.00/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Cationic Emulsion Polymer - Upshur County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
8	Anionic Emulsion Polymer - Marion County	70000.000	LB	1.600000	112000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Anionic Emulsion Polymer Price is $1.60/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Anionic Emulsion Polymer - Marion County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
9	Anionic Emulsion Polymer - Upshur County	5000.0000	LB	1.600000	8000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Anionic Emulsion Polymer Price is $1.60/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Anionic Emulsion Polymer - Upshur County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
10	Anionic Emulsion Polymer - Mineral County	3000.0000	LB	1.600000	4800.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Anionic Emulsion Polymer Price is $1.60/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Anionic Emulsion Polymer - Mineral County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
11	Anionic Emulsion Polymer - Clay County	10000.000	LB	1.600000	16000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Anionic Emulsion Polymer Price is $1.60/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Anionic Emulsion Polymer - Clay County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
12	Anionic Emulsion Polymer - Grant County	15000.000	LB	1.600000	24000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Anionic Emulsion Polymer Price is $1.60/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Anionic Emulsion Polymer - Grant County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
13	Anionic Emulsion Polymer - Monongalia County	18000.000	LB	1.600000	28800.00

Comm Code	Manufacturer	Specification	Model #
47131910			

Commodity Line Comments: Delivered Anionic Emulsion Polymer Price is $1.60/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Anionic Emulsion Polymer - Monongalia County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
14	Anionic Emulsion Polymer - Preston County	30000.000	LB	1.600000	48000.00

Comm Code	Manufacturer	Specification	Model #
47131910			

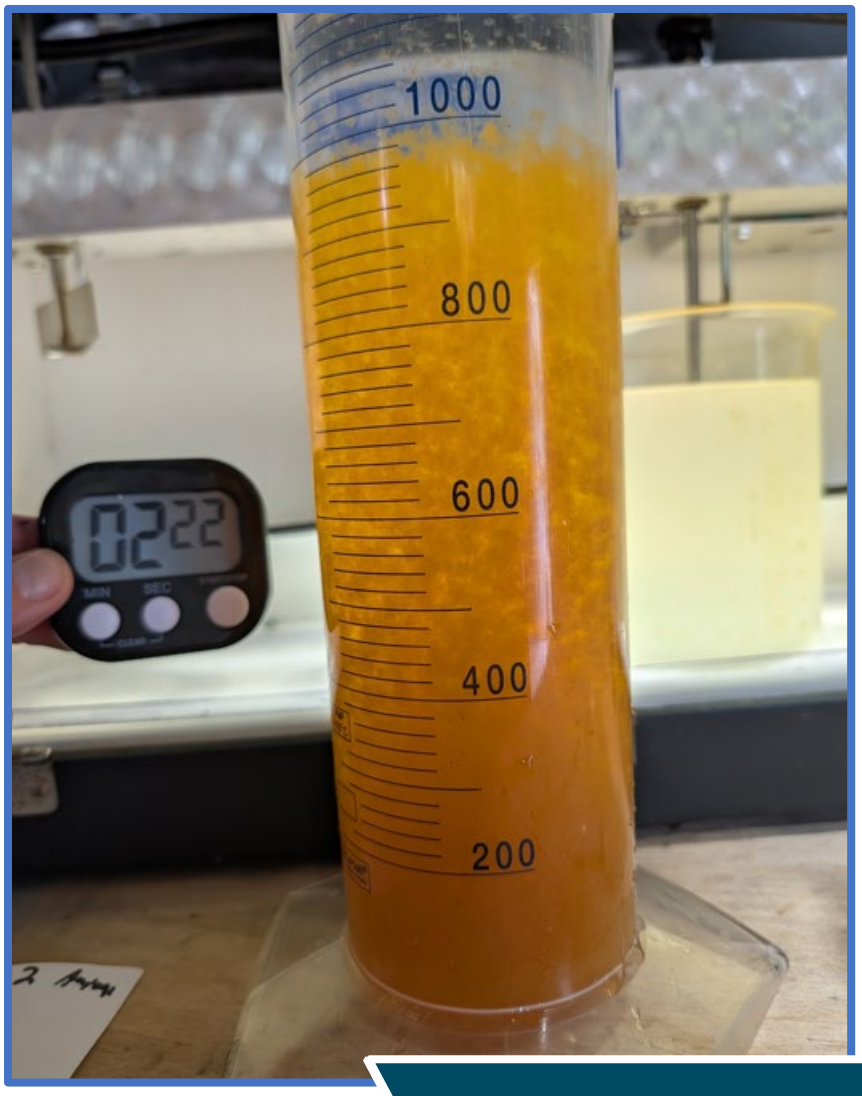
Commodity Line Comments: Delivered Anionic Emulsion Polymer Price is $1.60/lbs
We can deliver sooner than the 10-day requirement.

Extended Description:

Anionic Emulsion Polymer - Preston County, per section 3.1 of the specifications and Exhibit B.
Quantities are estimated and for bid purposes only.

Synthetic Polymer Flocculant Testing on Omega Treatment Facility Sludge

June 30, 2026



1046 Pike Run Dr.
Coal Center, PA 15423
Phone: 724.938.2657 | www.amdindustriesinc.com

July 01, 2026

Mr. James Hill.
Office of Special Reclamation
47 School Street Suite 301
Philippi, WV 26416

SUBJECT: Evaluation of Effectiveness of AMDI's Cationic and Anionic Polymers on the Settleability of Produced Solids at the Omega Treatment Facility

Dear Mr. Hill:

AMD Industries (AMDI) appreciates the opportunity to submit a bid for the West Virginia Office of Special Reclamation's (OSR) statewide polymer contract for mine drainage treatment. AMDI maintains a portfolio of more than 50 dry, emulsion, and pre-manufactured synthetic polymer flocculants sourced from leading manufacturers including Kemeria, SNF, Solenis, and Synethx Organics.

With more than 70 active mine drainage treatment facilities, AMDI routinely applies our polyacrylamide polymer flocculants to meet and maintain effluent standards for our clients across diverse water-quality conditions.

AMDI attended the mandatory pre-bid meeting on June 24, 2026, at the Omega Treatment Facility and collected a 5-gallon sludge sample as required. On June 26, our laboratory performed bench-scale testing using both cationic and anionic emulsion polymers. These tests demonstrated that AMDI's polymer formulations effectively achieve the effluent performance requirements outlined in the bid specifications.

The enclosed report and techniques provide a glimpse of the type of technical assistance AMDI will provide OSR if awarded the contract.

If you have any questions regarding this report, our capabilities, or any aspect of our bid submission, please contact me at the phone number provided below.

Sincerely,

AMD Industries Inc.

Brent Means, PG
Geochemist
717-929-3982

1.0 Methods and Evaluation Metrics

Because the Omega Treatment Facility uses a clarifier for solid–liquid separation, this evaluation follows polymer testing procedures commonly used by manufacturers when sizing clarifiers and assessing polymer performance. Clarifier effluent quality is governed by two primary factors:

1. **Polymer effectiveness** (charge type, molecular weight, charge density, and dose)
2. **The concentration of solids entering the clarifier center well**

Optimizing clarifier performance requires evaluating both factors together.

1.1 Polymer Effectiveness

Polymer flocculants agglomerate small suspended particles into larger, settleable flocs by attracting particles along the polymer chain through electrostatic interactions. Metal hydroxides—primarily iron and aluminum hydroxides—carry both positive and negative surface charges. Their net surface charge depends on treatment pH.

The “zero point of charge” for iron hydroxide typically occurs between pH 7.5 and 9.0.

- At pH < 9.0, iron hydroxide particles generally exhibit a net positive charge, making anionic polymers more effective.
- At pH > 9.0, the net charge becomes negative, making cationic polymers more effective.

However, because metal hydroxide particles always contain a distribution of surface charges, both cationic and anionic polymers can perform effectively across a wide pH range.

The polymer’s charge density determines how strongly it attracts metal hydroxide precipitates and how effectively it “bridges” particles together to form large flocs. According to Stokes’ Law, the terminal settling velocity of a particle in water increases with particle diameter; doubling floc size results in a fourfold increase in settling velocity. Synthetic polyacrylamide polymers exploit this principle by binding small particles into large flocs that settle rapidly even in systems with short retention times and high velocities, such as clarifiers and small ponds.

While polymer use will always improve settling compared to no polymer, selecting the **optimal** polymer requires evaluating charge type, charge density, molecular weight, and dose.

1.2 Measuring Polymer Effectiveness: Settling Rate

Settling rate is the primary metric used to evaluate polymer performance. It is measured by dosing polymer into a 2,000-mL graduated cylinder and recording the rate at which flocculated particles settle a known distance.

In general:

- Increasing polymer dose increases floc size
- Larger flocs settle faster
- Settling velocity must exceed the clarifier’s upward water velocity for solids to settle rather than be carried out the effluent

This evaluation compares measured settling velocities for various polymers and doses against the water velocity in the Omega clarifier at its design flow of **500 gpm**. If particle settling velocity exceeds water velocity, effective solid–liquid separation will occur.

1.3 Solids Concentration and Enhanced Flocculation

Polymer is typically dosed at very low concentrations (ppm), and metal precipitates in mine drainage also occur at low concentrations (e.g., Fe = 20.0 ppm). Even suspended solids concentrations of 500 mg/L are too low for polymer chains to reliably contact and flocculate all particles. The probability of complete interaction remains low even with extended mixing.

Therefore, when suspended solids concentrations are low, even the optimal polymer cannot fully flocculate all particles, resulting in residual “pin floc” and reduced effluent clarity.

The industry-standard technique to overcome this limitation is enhanced flocculation, achieved by recirculating a portion of clarifier sludge back to the influent to increase solids concentration before polymer addition. This increases the likelihood of polymer–particle interactions.

AMDI operates 16 clarifiers and routinely performs testing to determine the optimal center-well solids concentration for each system. Using sludge collected from Omega, AMDI determined that a TSS concentration of approximately **2,400 mg/L** is required to achieve optimal clarity after polymer addition at Omega. AMDI commonly adjusts sludge recirculation to achieve this concentration prior to polymer dosing.

1.4 Importance of Solids Concentration in Polymer Optimization

If the optimal polymer is selected based on settling velocity but the TSS entering the clarifier is too low, effluent clarity will remain suboptimal because the polymer cannot locate and interact with all suspended particles. Some flocculation will occur, but unflocculated pin floc will persist.

Figure 1 illustrates how TSS concentration affects clarity at a fixed polymer dose. A concentration of 2,500 mg/L produces significantly better clarity than lower concentrations, despite identical polymer type and dose.

Accordingly, the sludge sample collected at Omega was used to prepare cylinders containing 2,500 mg/L TSS, and these samples were used to screen polymers and evaluate dose effects on settling rate.

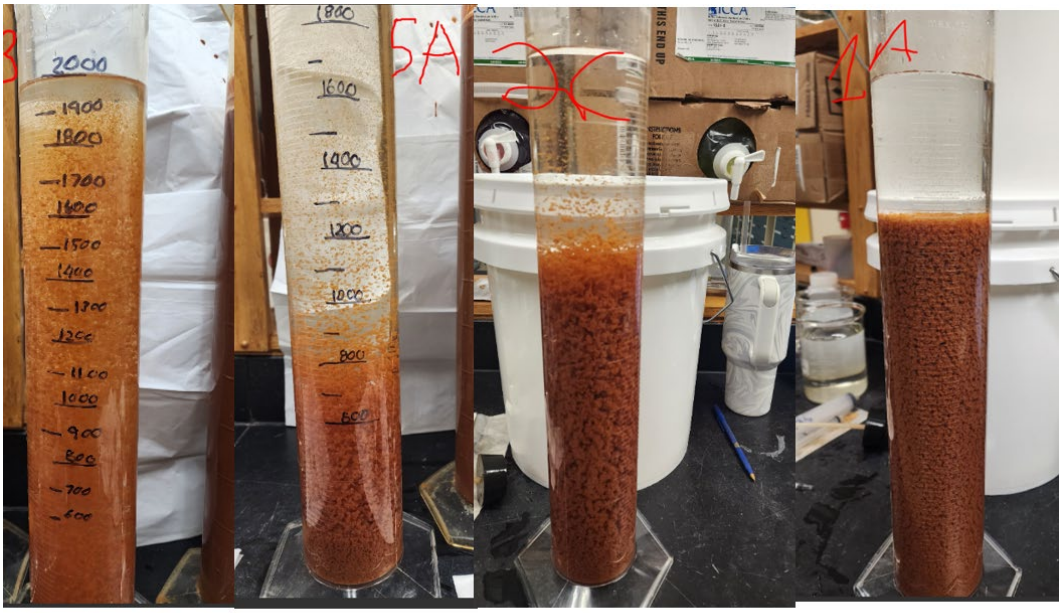


Figure 1. The cylinders containing different concentrations of sludge (TSS) and dosed with the same dose of polymer to illustrate the effect of TSS on clarity. A TSS of 350 mg/L is the left-most cylinder and 2,500 mg/L is on the right.

1.5 Summary of Methods and Evaluation Metrics

AMDI conducted a series of tests to evaluate how polymer type, polymer dose, and solids concentration affect settling rate and clarifier effluent clarity at the Omega treatment facility. Preliminary testing demonstrated that a **Total Suspended Solids (TSS) concentration of 2,500 mg/L** entering the clarifier center well produced optimal clarity. Although the Office of Special Reclamation (OSR) may not currently operate Omega at this solids concentration, the results remain directly relevant because they isolate the effects of polymer chemistry and dose on settling performance.

AMDI evaluated multiple polyacrylamide emulsion polymers across a range of charge types (cationic and anionic), charge densities (5–30%), and molecular weights using sludge samples containing 2,500 mg/L TSS. Clarity was assessed by collecting supernatant aliquots at 5, 9, and 15 minutes and measuring total iron. Most clarifier manufacturers use 9-minute supernatant clarity as the standard comparison point because clarifiers typically provide ≥ 5 hours of hydraulic retention time.

From this screening process, AMDI selected one cationic and one anionic emulsion polymer for detailed evaluation. Each polymer was tested at 0.25 ppm and 0.75 ppm, and both settling velocity and supernatant total iron were measured at the three settling intervals.

2.0 Emulsion Polymer Preparation

Polyacrylamide emulsion polymers are water-in-oil emulsions containing fully hydrated polymer inside water droplets surrounded by oil. Surfactants at the water–oil interface serve two essential functions:

1. **Storage Stability:** Surfactants prevent phase separation and gel formation during storage.
2. **Inversion:** When diluted to approximately **1% by weight**, hydrophilic surfactants migrate away from the droplet interface, causing the emulsion to invert to an oil-in-water system. This inversion ruptures the droplets, allowing polymer chains to uncoil and participate in flocculation.

Incomplete inversion results in weak floc formation because polymer remains trapped inside droplets. To ensure full inversion, AMDI prepared all polymer solutions by first creating a **1% solution** (1 mL emulsion + 100 mL dilution water), then diluting to **0.1%** by adding 900 mL of water (**Figures 2 & 3**). This method ensures consistent polymer activation for all tests

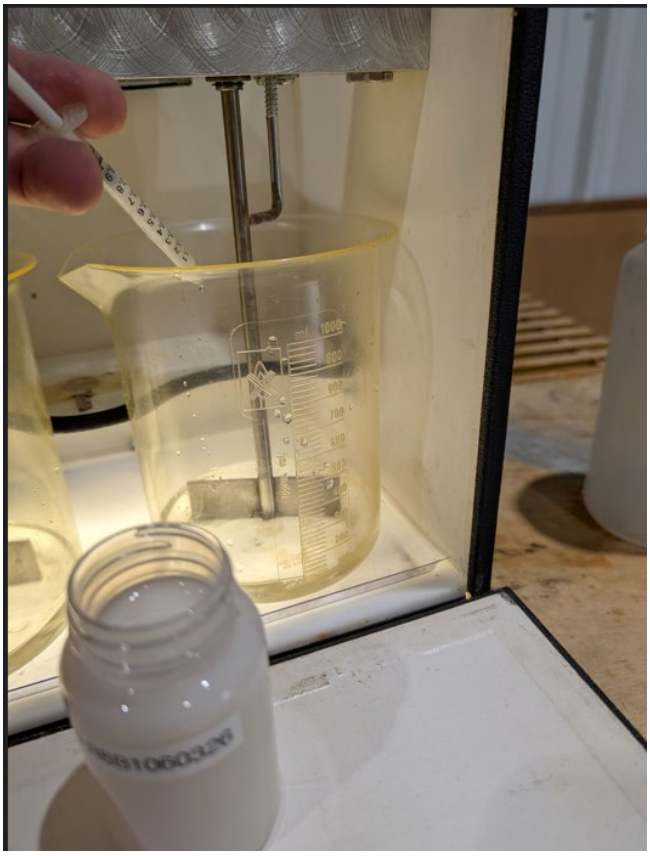


Figure 2: Dosing 1 mL of emulsion polymer into 100 mL of water (1% solution by wt.) to "invert" the polymer and prepare to make a dilute polymer solution for dosing.

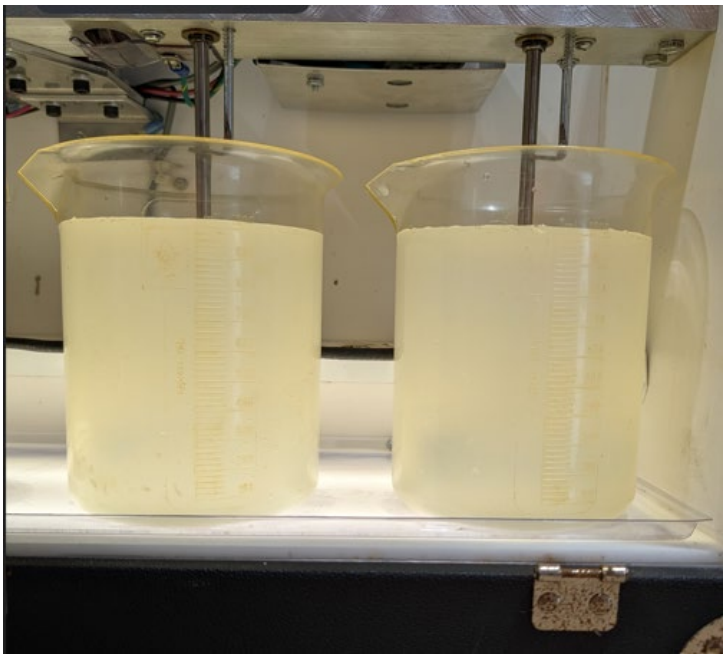


Figure 3: After inversion, 900 mL of water was added to make a 0.1% polymer solution by wt. to conduct dosing/testing. A 0.1% solution was selected to achieve a viscosity that would easily mix with sludge for flocculation.

3.0 Testing Results

Following the screening process, AMDI conducted detailed testing using the selected cationic and anionic emulsion polymers at **0.25 ppm** and **0.75 ppm**. Settling velocity and total iron were measured to evaluate how dose affects floc formation, settling performance, and clarity.

Discussions with Dave McCoy confirmed the Omega clarifier dimensions and flow rates:

- **Clarifier diameter:** 35 ft
- **Design flow:** 500 gpm
- **Typical flow:** 200 gpm

Using these values, AMDI calculated the upward water velocity (rate of rise):

- **0.03 ft/min** at 200 gpm
- **0.07 ft/min** at 500 gpm

For particles to settle rather than be carried over the overflow weir, **settling velocity must exceed the upward velocity**. These velocities were compared directly to the measured settling velocities at both polymer doses.

	200 gpm	500 gpm
Clarifier Water Velocity (ft/min)	**.03**	**0.07**

Table 1: Clarifier upward water velocities.

3.1 Cationic Emulsion Polymer Testing

The selected cationic emulsion polymer was dosed into a 2,500 mg/L TSS sludge sample at 0.25 ppm and 0.75 ppm. Results are shown in **Figures 4 and 5**.

- Increasing the dose from 0.25 ppm to 0.75 ppm increased settling velocity by 3.7×.
- At 0.25 ppm, settling velocity approximates the clarifier's upward velocity at 500 gpm, and the 5-minute total iron is slightly above the bid specification of 3.0 mg/L.
- However, 9-minute and 15-minute total iron values are significantly below 3.0 mg/L.
- At 200 gpm, the 0.25 ppm dose provides acceptable clarity because the upward velocity is lower.
- The 0.75 ppm dose provides acceptable settling velocity and clarity under all flow conditions.

AMDI's conclusion:
A 0.75 ppm dose is preferred for reliability, but 0.25 ppm is acceptable during typical flow conditions (200 gpm). Photos are provided in **Appendices 1–5**.

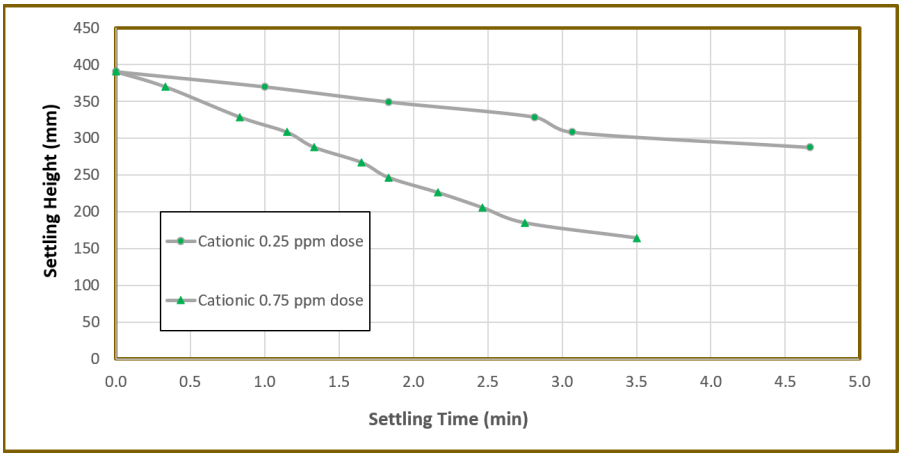


Figure 4: Settling test results showing the settling velocity of Omega sludge at a 0.25 and 0.75 ppm dose. The settling velocity increases by 3.7 times if the dose is increased to 0.75 ppm.

		Total Iron Concentration of Supernate after specified settling time		
	Settling Velocity (ft/min)	5 min	9 min	15 min
0.25 ppm dose	0.07	3.08	2.47	1.95
0.75 ppm dose	0.26	1.02	0.77	0.70
Special Rec. Bid document standard of total iron = 3.0 mg/L.				

Figure 5: Settling velocities and iron concentrations in the supernate after dosing a Cationic polymer at 0.25 and 0.75 ppm.

3.2 Anionic Emulsion Polymer Testing

An anionic emulsion polymer was dosed into a 2,500 mg/L TSS sludge sample at 0.25 ppm and 0.75 ppm. Results are shown in **Figures 6 and 7**.

- Increasing the dose from 0.25 ppm to 0.75 ppm increased settling velocity by 2.7×.
- At 0.25 ppm, settling velocity is slightly higher than the upward velocity at 500 gpm, but the 5-minute total iron is 3.94 mg/L, above the 3.0 mg/L standard.
- As with the cationic polymer, 9-minute and 15-minute total iron values are significantly below 3.0 mg/L.
- The 0.75 ppm dose provides acceptable settling velocity and clarity under all flow conditions.
- At 200 gpm, the 0.25 ppm dose is acceptable because the clarifier provides more than 5 minutes of settling time.

Photo documentation of the testing is provided in **Appendices 6–9**.

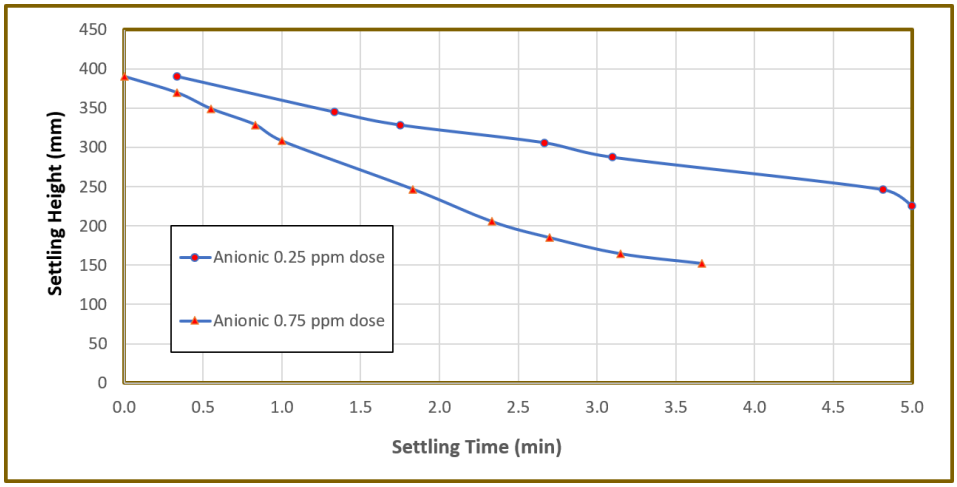


Figure 6: Settling test results showing the settling velocity of Omega sludge at a 0.25 and 0.75 ppm dose. The settling velocity increases by 2.7 times (as opposed to 3.7 times with Cationic) if the dose is increased to 0.75 ppm.

		Total Iron Concentration of Supernate after specified settling time		
	Settling Velocity (ft/min)	5 min	9 min	15 min
0.25 ppm dose	0.09	3.94	2.65	2.2
0.75 ppm dose	0.25	0.81	0.75	0.58
Special Rec. Bid document standard of total iron = 3.0 mg/L.				

Figure 7: Settling velocities and iron concentrations in the supernate after dosing an Anionic polymer at 0.25 and 0.75 ppm.

3.3 Summary of Cationic vs. Anionic Emulsion Polymer Testing

- At 0.25 ppm, the anionic polymer exhibits slightly higher settling velocity than the cationic polymer (**Figure 8**).
- At 0.75 ppm, both polymers exhibit similar settling velocities.
- **Figure 9** shows that all polymers at all doses, except the cationic polymer at 0.25 ppm, produce settling velocities greater than the clarifier's upward velocity at 500 gpm.
- **Figure 10** shows both polymers achieved the total iron effluent requirement except at the 0.25 ppm dose with only 5 minutes of settling time.

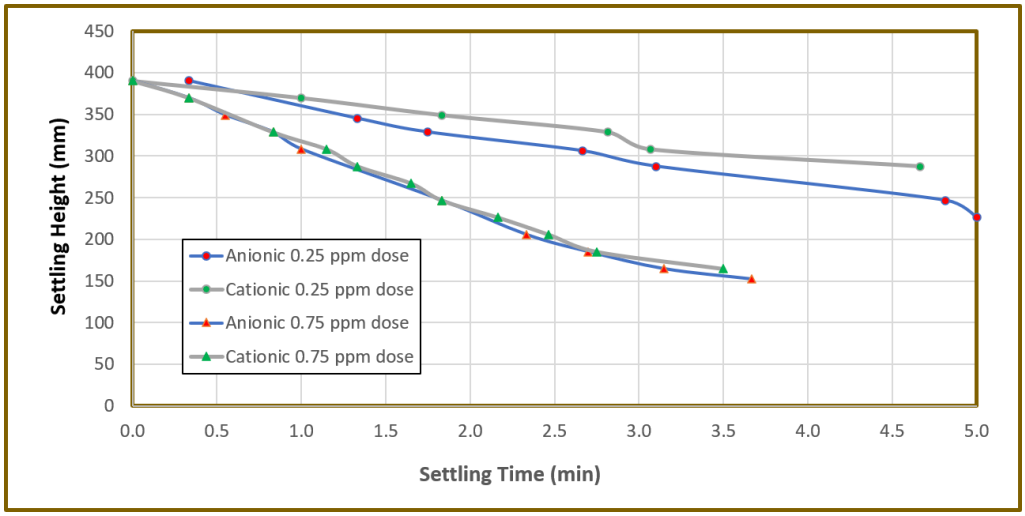


Figure 8: Slope of the line equals the settling velocity. The steeper the line the faster the settling velocity.

	Anionic Emulsion Dose		Cationic Emulsion Dose	
	0.25 ppm	0.75 ppm	0.25 ppm	0.75 ppm
Settling Velocity (ft/min)	0.09	0.25	0.07	0.26
Clarifier Velocity at 500 gpm (ft/min)	0.07			

Figure 9: Settling velocities compared to clarifier water velocity at all polymer doses.

	Anionic Emulsion Dose		Cationic Emulsion Dose	
	0.25 ppm	0.75 ppm	0.25 ppm	0.75 ppm
Total Iron after 5 min settling time	3.94	0.81	3.08	1.02
Total Iron after 9 min settling time	2.65	0.75	2.47	0.77
Total Iron after 15 min settling time	2.2	0.58	1.95	0.7
Red indicates results that exceed total iron standard				

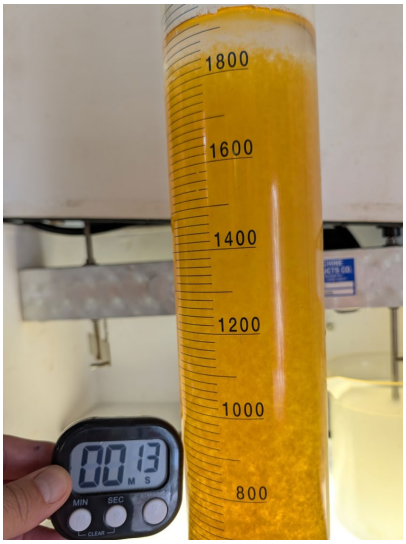
Figure 10: A comparison of the total iron in the supernate at different polymer doses and settling times.

3.31 Recommendation

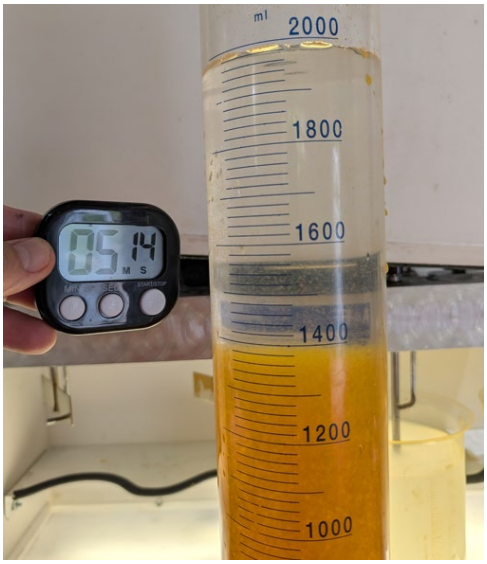
AMDI recommends a 0.75 ppm polymer dose (either Cationic or Anionic) as the optimal balance between settling rate, clarity, and cost. If budget constraints require minimizing polymer usage, a 0.25 ppm dose may be used during typical flow conditions (200 gpm). However, at flows above 400 gpm, a 0.25 ppm dose may result in elevated effluent iron.

Appendices Below providing photo documentation of testing

3.4 Cationic Polymer Photo Documentation at a 0.25 ppm Dose



Appendix 1: Supernate formed and settling occurred within 13 seconds of dosing a cationic emulsion polymer at a 0.25 ppm dose.



Appendix 2: After 5 minutes significant settling occurred and a sample of the top of the supernate showed a total iron concentration of 3.08 mg/L. Some floc are visible near the solid/liquid interface.

Appendix 3: After 9 minutes of settling the total iron in the supernate was 2.47 mg/L and after 15 minutes was 1.95 mg/L. After 12 minutes of settling time the supernate is visibly clear.

3.5 Cationic Polymer Photo Documentation at a 0.75 ppm Dose

Appendix 4: After 5 minutes of settling, the 0.75 ppm dose settled 600 mL more than the 0.25 ppm dose and the total iron after 5 minutes was 1.02 mg/L at the 0.75 ppm dose compared to 3.08 mg/L at the 0.25 ppm dose.

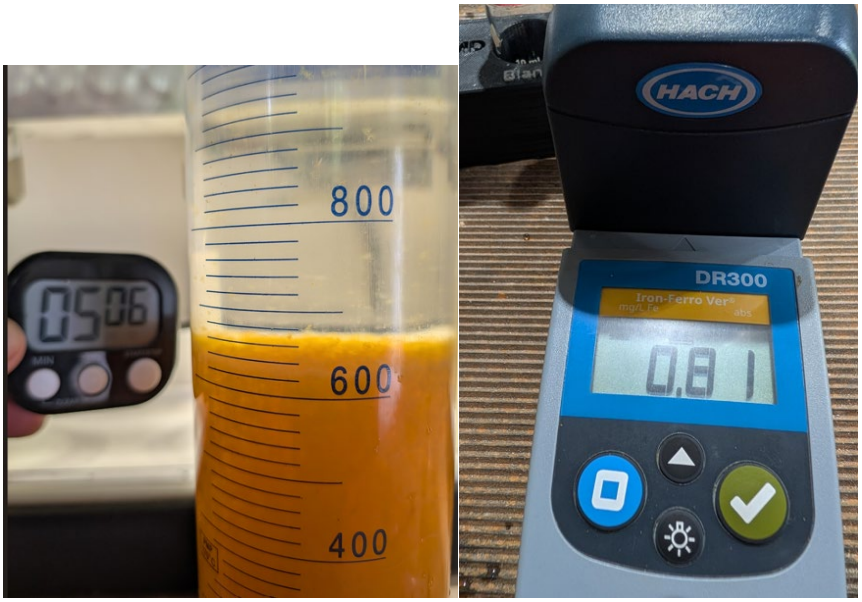
Appendix 5: After 9 minutes of settling the total iron in the supernate was 0.77 mg/L and after 15 minutes the total iron was 0.7 mg/L, indicating that most of the clarity is achieved at a 0.75 ppm dose after 9 minutes of settling time.

3.6 Anionic Polymer Photo Documentation at a 0.25 ppm Dose

Appendix 6: After 5 minutes of settling, the 0.25 ppm dose settled 400 mL and the total iron after 5 minutes was 3.94 mg/L.

Appendix 7: After 9 minutes of settling the total iron in the supernate was 0.77 mg/L and after 15 minutes the total iron was 0.7 mg/L, indicating that most of the clarity is achieved at a 0.75 ppm dose after 9 minutes of settling time.

3.7 Anionic Polymer Photo Documentation at a 0.75 ppm Dose



Appendix 8: After 5 minutes of settling, the 0.75 ppm dose settled 1,300 mL and the total iron after 5 minutes was 0.81 mg/L at the 0.75 ppm dose compared to 3.94 mg/L at the 0.25 ppm dose.

Appendix 9: After 9 minutes of settling the total iron in the supernate was 0.75 mg/L and after 15 minutes the total iron was 0.58 mg/L.

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

(Printed Name and Title) Brent Means

(Address) 1046 Pike Run Drive Coal Center PA 15423

(Phone Number) / (Fax Number) 717-919-3982

(email address) brent.means@amdindustriesinc.com

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through *wv*OASIS, I certify that: I have reviewed this Solicitation/Contract in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation/Contract for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that this bid or offer was made without prior understanding, agreement, or connection with any entity submitting a bid or offer for the same material, supplies, equipment or services; that this bid or offer is in all respects fair and without collusion or fraud; that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; that I am authorized by the Vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on Vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

By signing below, I further certify that I understand this Contract is subject to the provisions of West Virginia Code § 5A-3-62, which automatically voids certain contract clauses that violate State law; and that pursuant to W. Va. Code 5A-3-63, the entity entering into this contract is prohibited from engaging in a boycott against Israel.

AMD Industries Inc

(Company)

John J. DeFranco

(Signature of Authorized Representative)

John DeFranco

(Printed Name and Title of Authorized Representative) (Date)

412-582-8681

(Phone Number) (Fax Number)

john@amdindustriesinc.com

(Email Address)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ 0313 DEP2600000039

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

- [x] Addendum No. 1
- [x] Addendum No. 2
- [ ] Addendum No. 3
- [ ] Addendum No. 4
- [ ] Addendum No. 5
- [ ] Addendum No. 6
- [ ] Addendum No. 7
- [ ] Addendum No. 8
- [ ] Addendum No. 9
- [ ] Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

AMD Industries Inc
Company

John J. Petrunia
Authorized Signature

7-1-2026
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

8.4 Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: Brent Means

Telephone Number: 717-919-3982

Fax Number: 724-938-0830

Email Address: brent.means@amdindustriesinc.com

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ DEP26*39

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

[✓]	Addendum No. 1	[ ]	Addendum No. 6
[✓]	Addendum No. 2	[ ]	Addendum No. 7
[ ]	Addendum No. 3	[ ]	Addendum No. 8
[ ]	Addendum No. 4	[ ]	Addendum No. 9
[ ]	Addendum No. 5	[ ]	Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

AMD Industries Inc
Company

John J. Petrunko
Authorized Signature

7-1-2026
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012