



Encontro Técnico **AESABESP**

Congresso Nacional
de Saneamento e
Meio Ambiente

Tecnologia Sustentável para Saneamento

CLEARFLOW GROUP
Nomes dos demais Autores
Instituição ou endereço para contato

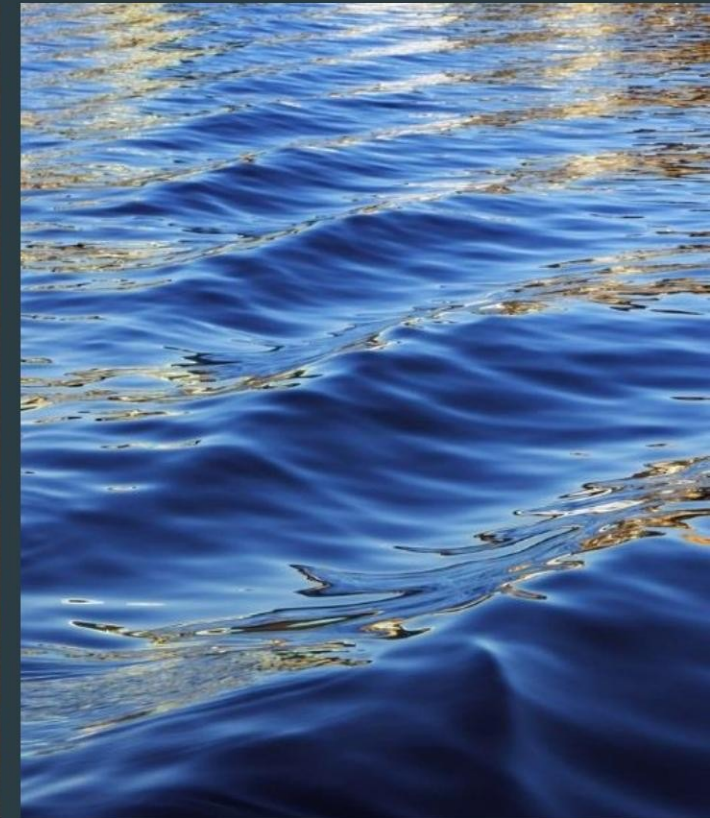




Clearflow

Tecnologia Sustentável para Saneamento

*Protegendo e preservando
Bacias hidrográficas hoje para um ambiente mais verde
Amanhã*



O que o Clearflow faz

• A empresa começou em 2005 como Clearflow Consulting Inc. e desde então evoluiu para Clearflow Group Inc. a partir de 2016.

A Clearflow é especializada na fabricação de tecnologia de tratamento de água e de sólidos que inclui floculantes em gel patenteados , exclusiva da Clearflow.

Os “Floculante em Gel” foram projetados para remover sólidos suspensos, metais e fósforo para atender os requisitos regulatórios, protegendo o meio ambiente, os peixes e o ecossistema circundante.

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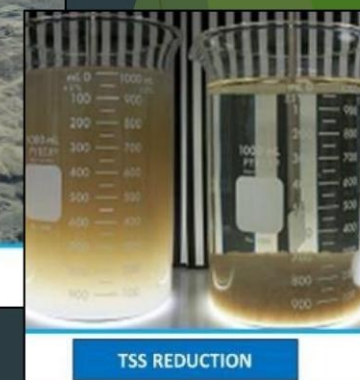
Gel Clearflow Floculante e Polimento de água



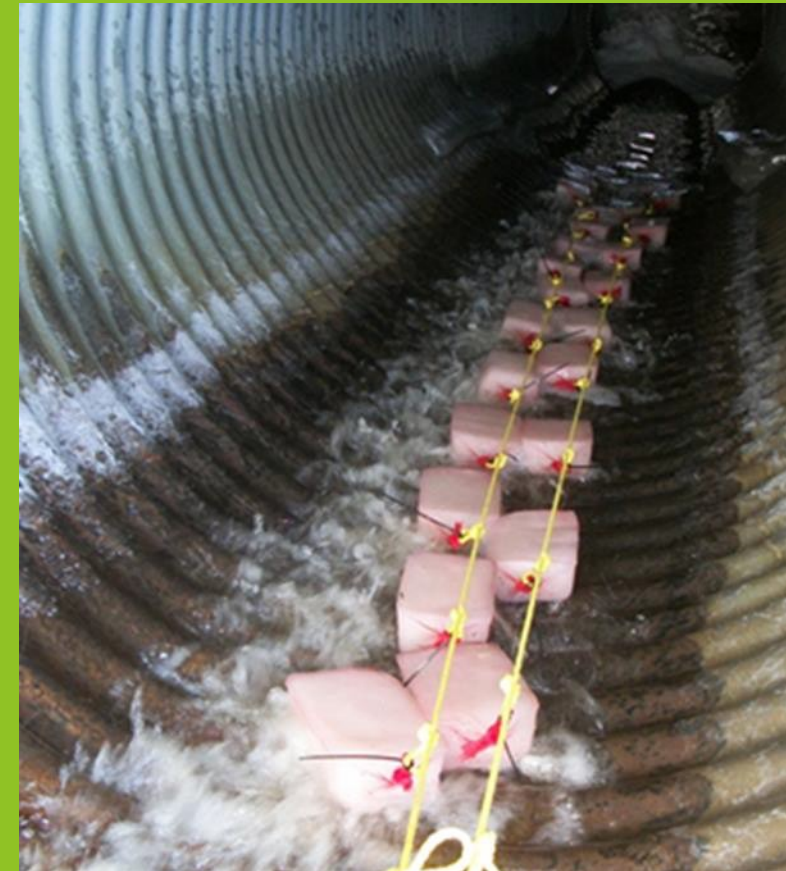
Floculantes em gel Clearflow uma inovação única



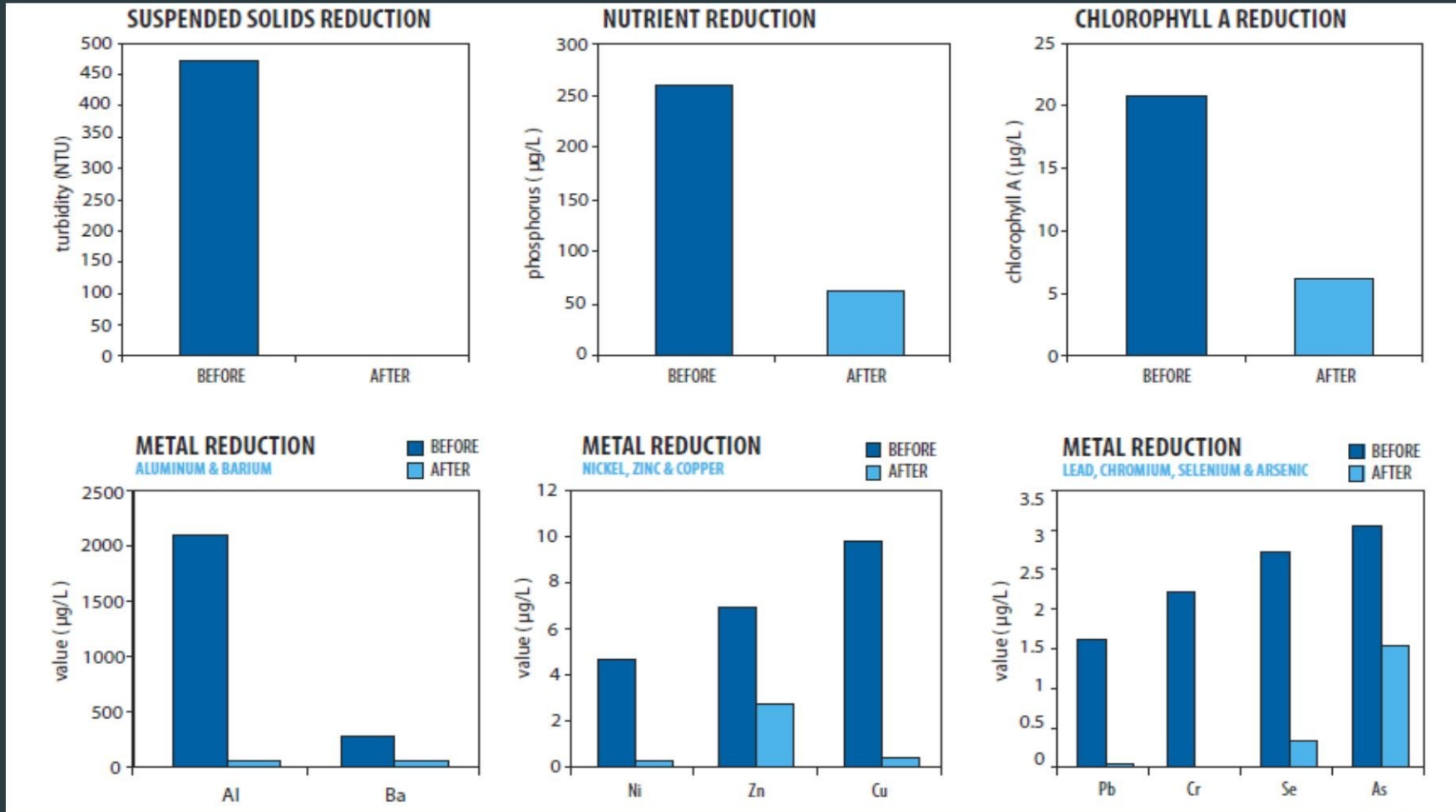
- Amigo do ambiente, amigo dos peixes.
- Autodosagem – não requer monitoramento.
- Tratamento passivo – sem necessidade de energia ou combustível.
- Facilmente instalado em áreas remotas.
- CAPEX baixo e OPEX competitivo
- Atua entre range de 3 pH e 12 pH.
- Reduz sedimentos, metais, vários níveis de nutrientes, orgânicos, e níveis de hidrocarbonetos leves.



Aplicações

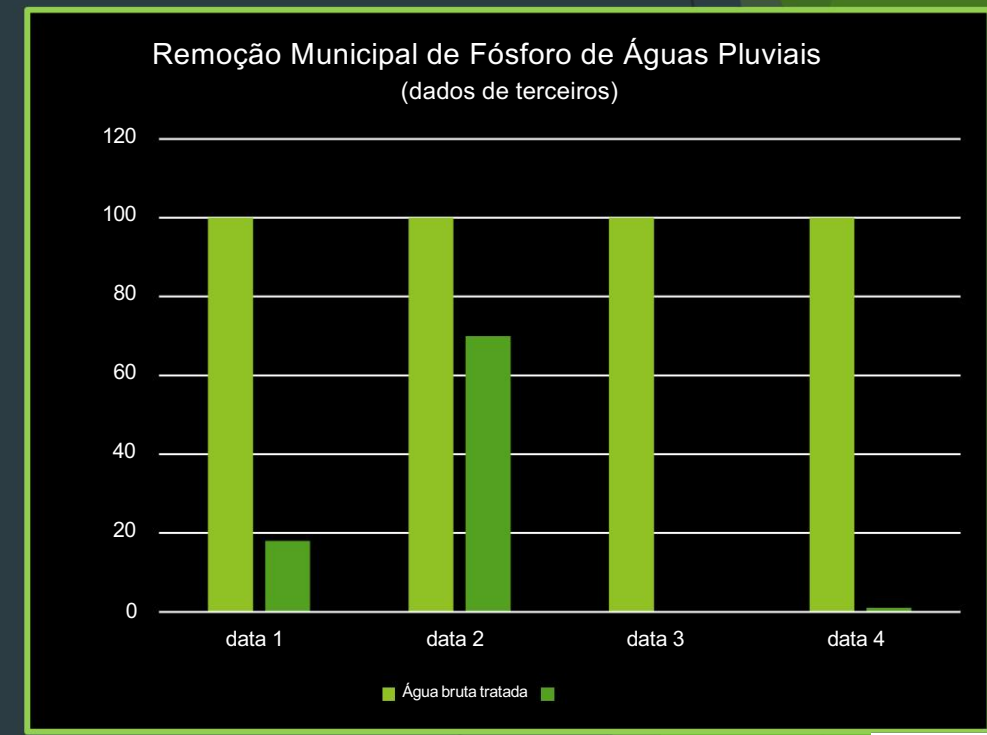
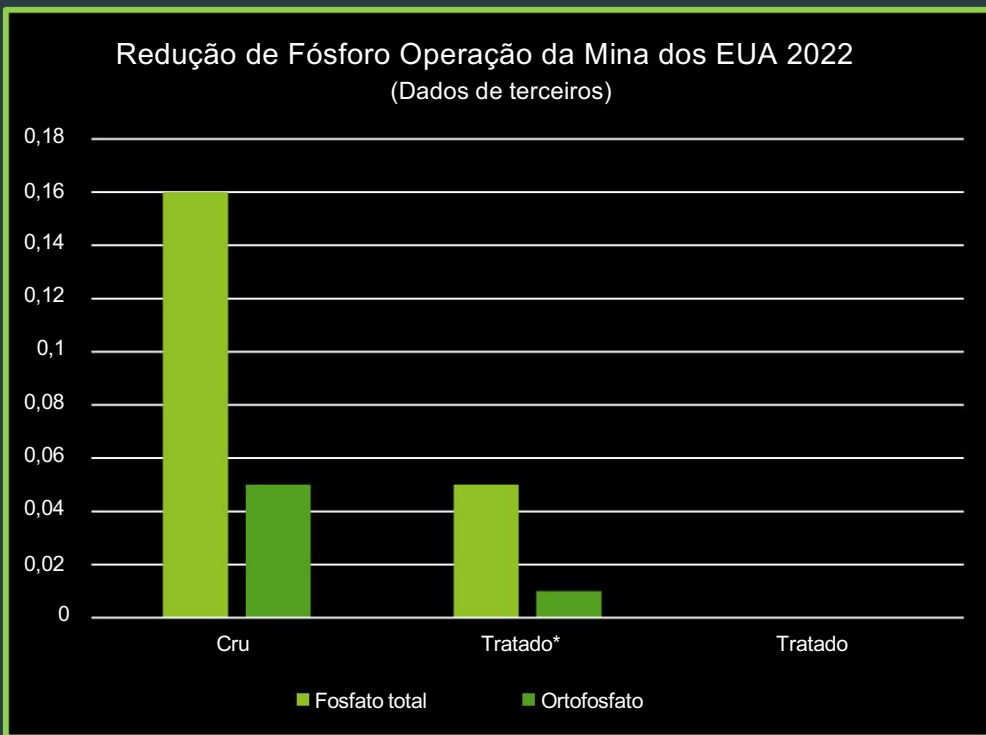


Qualidade da Água Melhorada



Qualidade da Água Melhorada

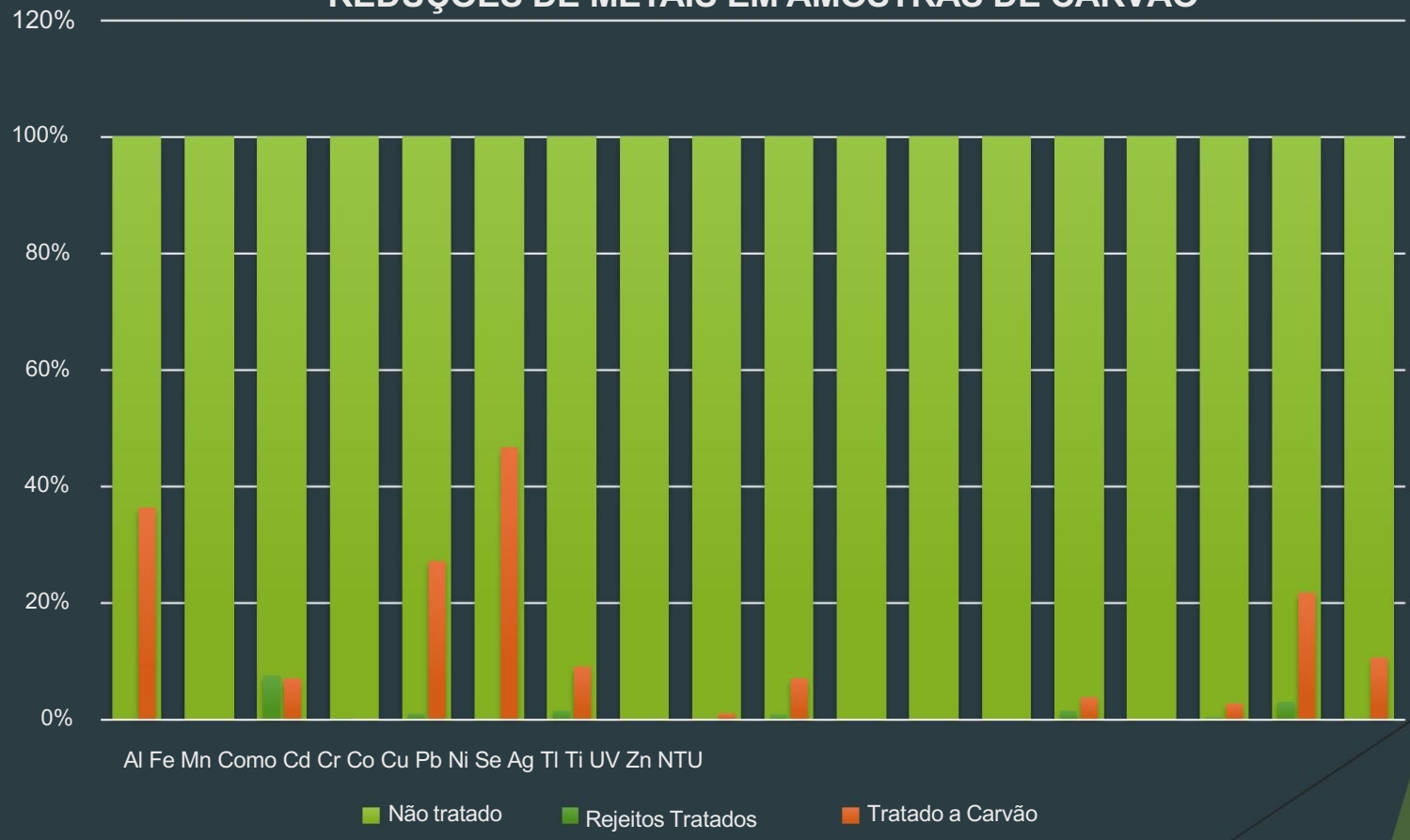
Fósforo Redução



Todos os dados fornecidos por Laboratórios Certificados de Terceiros

Gel Floculante Redução de Metais

REDUÇÕES DE METAIS EM AMOSTRAS DE CARVÃO



Tapetes de coleta de lodo

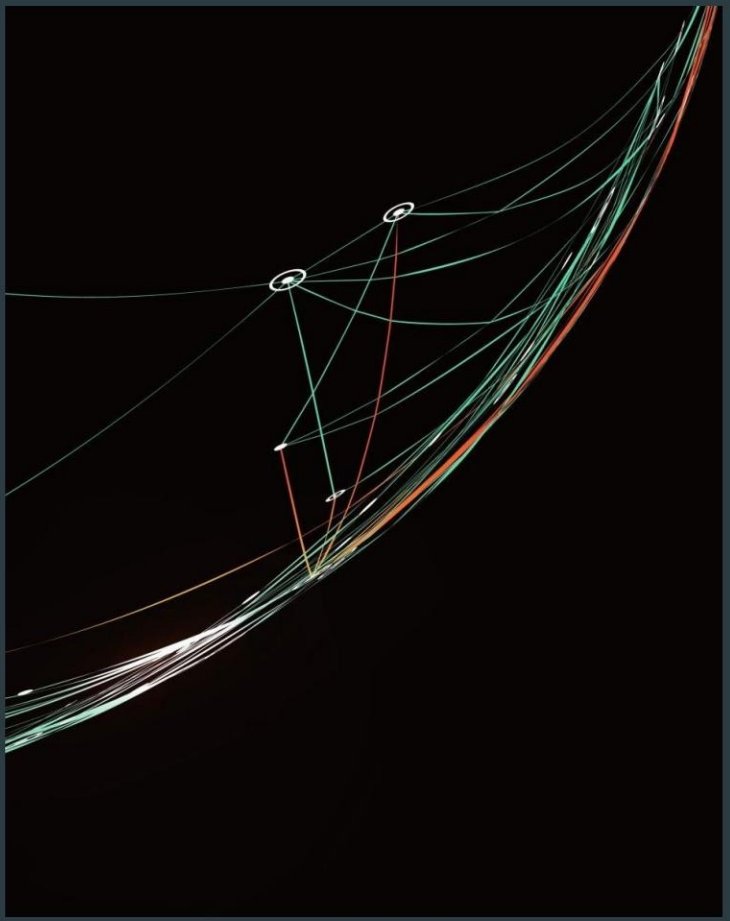
• Silt Mat captura mais de 40 kg de sedimentos por tapete. •

Comprovado em campo para reduzir os níveis de sólidos suspensos a jusante • Silt Mat é um tapete totalmente biodegradável que captura e evita a ressuspensão de sedimentos.

• As esteiras podem ser colocadas em canais naturais ou artificiais, valas ou diretamente em terra para reter sedimentos em suspensão.

• Silt Mats são utilizados para gerenciar lançamento de sedimentos para os cursos d'água.





Novo Inovações por Ambiental Proteção

SEGURO Comprovado para Organismos Aquáticos

Maxxam Analytics
48hr *Daphnia magna* Bioassay Report
(Acute Aquatic Toxicity Test) Project: B0C0794-Z00921

Client Name: ClearFlow Consulting Ltd
Location: Sherwood Park, AB

Sample Data:

Sample Description: Water Lynx CFPL 360 (New Brand name-Water Lynx 360)
Visual Description: white gel
Sampling Location: Clear Flow
Sampling Method: Chemical Product
Volume Obtained: 200 g
Sampled By: JM

Sample Date: 10 12 10 Time: n/g
Date Received: 10 12 10 Time: 1530
Bioassay Date: 10 12 18 Time: 1000
Report Date: 11 03 31
Deviations from Method: none
Comments: Report re-issued March 2011 at client request to update product name from sample ID originally provided.

Bioassay Results:

CETIS Statistical Program

LC50 @ 48 Hours: >1500 mg/L
Method: n/a
95 % Confidence Interval: n/a

EC50 @ 48 Hours: 125 mg/L
Method: Spearman-Kärber
95 % Confidence Interval: 80.6<125.0<193.8 mg/L

Note: Results relate only to the item tested.

Legend:
LC50/EC50 indicates concentration of sample, in percent, which kills or affects 50% of test organisms.

Maxxam Analytics
96hr Rainbow Trout Bioassay Report
(Acute Aquatic Toxicity Test) Project: B0C0794-Z00921

Client Name: ClearFlow Consulting Inc
Location: Sherwood Park, AB

Sample Data:

Sample Description: Water Lynx CFPL 360 (New Brand name-Water Lynx 360)
Sampling Location: ClearFlow
Sampling Method: Chemical Product
Volume obtained: 200g
Sampled By: JM

Sample Date: 10 12 10 Time: n/g
Date Received: 10 12 10 Time: 1530
Bioassay Date: 10 12 18 Time: 1200
Report Date: 11 03 31
Deviations from method: none-chemical test per EPS 1/RM/9
Comments: Report re-issued March 2011 at client request to update product name from sample ID originally provided.

Bioassay Results:

CETIS Statistical Program

LC50 @ 96 Hours: 147.5 mg/L
Method: Probit
95 % Confidence Interval: 70.4<147.5<203.7 mg/L

EC50 @ 96 Hours: 140.3 mg/L
Method: Spearman-Kärber
95 % Confidence Interval: 104.1<140.3<189.1 mg/L

Note: The results relate only to the item tested.

Results of Phenol Reference Bioassay:

LC50 @ 96 Hours: 11.64 mg/L
95 % Confidence Interval: 10.98<11.64<12.35 mg/L
Method: Spearman-Kärber
95 % Confidence Interval: 8.48<10.64<13.35
Method: Schewhart Warning Limit
Historical Mean ± 2SD: 10.64±2.52
Date of Reference Bioassay: 10 12 10

The reference toxicant is conducted under the same conditions as the definitive testing.

Data & QA/QC
Reviewed By: Jay Abbott, Bioassay Supervisor

Legend:
LC50/EC50 indicates concentration of sample, in percent, which kills or affects 50% of test organisms.

LC50 @ 48 Hours : >1500 mg/L
Method : n/a
95 % Confidence Interval : n/a

EC50 @ 48 Hours : 125 mg/L
Method : Spearman-Kärber
95 % Confidence Interval : 80.6<125.0<193.8 mg/L

LC50 @ 96 Hours : 147.5 mg/L
Method : Probit
95 % Confidence Interval : 70.4<147.5<203.7 mg/L

EC50 @ 96 Hours : 140.3 mg/L
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95 % Confidence Interval : 104.1<140.3<189.1 mg/L



CATIONIC DETECTION FIELD KIT 3 mg/L

www.clearflowgroup.com

Total Suspended Solids (TSS)

Industrial operations such as mining, road building and aggregate washing result in high concentrations of suspended particles.

Cationic Toxicity to Fish

The use of chemical coagulation and subsequent flocculation is a common treatment to improve the efficacy of TSS removal prior to discharge into the environment. However, these cationic flocculating agents, can be toxic to fish, even at very low concentrations (0.3 – 0.5 mg/L). Noted effects include gill adherence and subsequent epithelial damage.

Cationic Detection Kit

The Cationic Detection Field kit is engineered to quickly test on-site treated process water waste streams for residual Cationic polymers. Industries and operations adhering to regulatory standards regarding aquatic health would utilize this technology to ensure treated water is suitable for environmental release.

Toxicity Mitigation Agent (MA)

The potential toxicity of treated flocculated water can be mitigated by applying Clearflow's proprietary mitigation agent CN-369

Aquatic Protection

The application of the neutralizer agent and the verification of toxicity mitigation was engineered to protect aquatic life. This advanced technology was verified fish safe by the University of Alberta, and co-funded by the National Research Council Canada through the Industrial Research Assistance Program (IRAP).



FEATURES:

- Evaluated by 3rd party research institute, U of A.
- Detection capability to 3 mg/L.
- "Fish Safe" measurement device.
- Simplified test for measuring residual cationic polymer.
- Tool to mitigate liability and regulatory fines.
- Environmental safety check.
- Easily calibrated for on-site use.
- Canadian Technology.
- Patent protected.



SHERWOOD PARK | 780.410.1403 OFFICE
UNIT 140, 134 PEMBINA ROAD | 780.410.1405 FAX
TBH 0M2 CANADA | SALES@CLEARFLOWGROUP.COM

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CATIONIC NEUTRALIZER CN-369

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Anionic vs. Cationic Polymers

Industry and Environmental Regulatory bodies have determined that anionic polymers are safer than cationic polymers for aquatic life. While Clearflow Group Inc. manufactures a safe to fish anionic polymer, Clearflow also proactively engaged research and development of an environmentally safe application of cationic polymers by introducing a fish safe cationic neutralizer in 2017. The Clearflow Cationic Neutralizer is an effective product to neutralize the toxicity of cationic polymers, creating a safe treatment application for sensitive aquatic organisms.

Suitable Applications

Applications for Clearflow Cationic Neutralizer include mining or industrial process water waste streams, where the goal or regulation is to operate with safe water release to the natural environment. Any mining operation using cationic flocculant to reduce total suspended solids (TSS) aligns with the application Clearflow's Cationic Neutralizer technology.

Fish Safe Verified

Aquatic protection is fundamentally what the neutralizer liquid is engineered for. This advanced technology was verified fish safe by the University of Alberta, and co-funded by the National Research Council Canada through the Industrial Research Assistance Program (IRAP).



Effects of CC and MA exposure on gill morphology

Clearflow Group's CN-369

- Scientifically proven to ameliorate (neutralize) Cationic Polymers making them safe for environmental release.
- "Fish Safe" – CN 369 can actually reverse oxidative stress effects to fish cationic polymer exposure.
- Reducing potential liability and regulatory fines for the end-user client.
- Safe for the environment
- Easily calculated for appropriate dosing of the Cationic Polymer.
- Available in liquid, granular and gel block format.
- A Canadian technology product.
- Patent Protected



In stream self-dosing passive application.



SHERWOOD PARK | 780.410.1403 OFFICE
UNIT 140, 134 PEMBINA ROAD | 780.410.1405 FAX
TBH 0M2 CANADA | SALES@CLEARFLOWGROUP.COM

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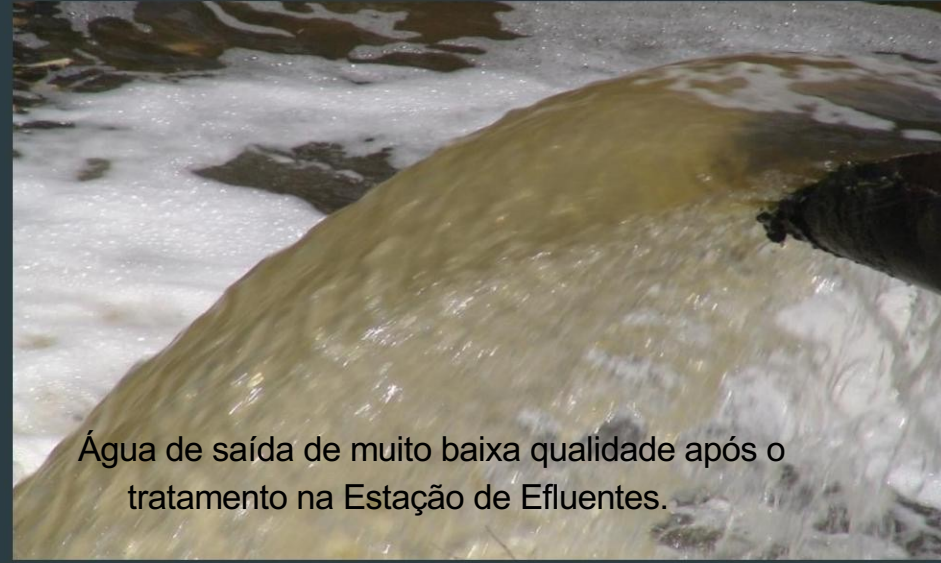


Rio Nablus, Oriente Médio

11.000 m³/dia (10.795 toneladas/dia)



Qualidade das águas residuais muito fraca, esgoto bruto e alta carga de cálcio.



Água de saída de muito baixa qualidade após o tratamento na Estação de Efluentes.



Algas bastante visíveis sem sedimentação.



Gel Flocculante e Treated Fabric™ instalado em 14 de julho

Clearflow limpa sedimentos do rio Nablus

, Médio Oriente



17 de julho : 3 dias após a instalação do Clearflow, a água está limpa.



Sedimentação ocorrendo sobre algas.



Clareza da água 100m a jusante.



Escritório canadense:

Unidade 140, 134 Pembina Road
Sherwood Park. AB T8H 0M2

[Telefone: 780.410.1403](tel:780.410.1403)

[Email: admin@clearflowgroup.com](mailto:admin@clearflowgroup.com)

[Site: www.clearflowgroup.com](http://www.clearflowgroup.com)

Localização dos EUA:

Unidade 150, 4635 W McDowell Rd

Phoenix, AZ 85035

Telefone: 1-602-612-6156



Escritório Brasileiro:

Rua Maria Caputo Pagano

São Bernardo do Campo - SP

Phone: +55 (11) 4354-9477

Mobile: +55 (11) 99733-4903

Email: gilmar@alphawater.com.br

Site: www.alphawater.com.br

