

Wastewater Treatment at Slaughterhouses

Industry Report '23



GI AQUA TECH
Water & Wastewater Solutions

Content

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A word from our CEO



SHERIF DESOUKY

**Chief
Executive
Officer**

“INNOVATION, ADAPTABILITY, AND SUSTAINABILITY ARE THE HALLMARKS OF EXCELLENCE IN OUR INDUSTRY. WE CONTINUOUSLY STRIVE TO CREATE SOLUTIONS THAT EMBODY THESE TRAITS. WHEN WE RESPECT THE ENVIRONMENT, IT INVARIABLY RECIPROCATES, FOSTERING A CYCLE OF MUTUAL BENEFIT AND GROWTH.”

In the fast-paced, dynamic world of the slaughterhouse industry, it is our steadfast belief that we have a responsibility not just to the economics of business but also to the environment and communities we operate within. For many, the complexities of managing wastewater represent a challenge. For us at GI Aqua Tech, it presents an opportunity to showcase our commitment to sustainable practices and cutting-edge technology.

We developed our G-NANO System to understand the need for an economically viable and environmentally responsible solution. This innovative technology was designed to outperform traditional methods and reflects our ongoing mission to create a sustainable future for our industry.

As we progress, the demand for more sustainable practices continues to increase, driven by stringent regulations, public concern, and our inherent duty to protect our planet. Our commitment is to meet this demand and more while remaining at the forefront of technological advancement in wastewater treatment.

We have put this report together to give you an insight into the problems and solutions surrounding slaughterhouse wastewater management. We trust you will find this informative and enlightening as we all strive to bring about an era where wastewater management is efficient, economical, and, above all, sustainable.

Sh. Desouky





GI AQUA TECH

Wastewater
Treatment at
Slaughterhouses

'23

Executive Summary

In the ever-evolving landscape of the slaughterhouse industry, wastewater management remains a critical challenge that demands innovative, cost-effective, and environmentally friendly solutions. This report presents an in-depth industry analysis, highlighting key problems, challenges, and current market trends and exploring traditional and emerging wastewater treatment methodologies.

The slaughterhouse wastewater, a byproduct of processing animal-derived proteins, contains various pollutants, from organic matter, nutrients, and pathogens to hormones, antibiotics, and animal fats. If inadequately managed, these substances pose significant environmental and public health risks, leading to water pollution, soil contamination, and air pollution. Furthermore, non-compliance with increasingly stringent regulations can incur substantial financial penalties, business disruptions, and community distrust.

This report underscores the pivotal role of efficient wastewater treatment processes, from primary, secondary, to tertiary treatments, in mitigating these challenges. Various techniques, including chemical, physical, and biological treatments, ultraviolet disinfection, and advanced oxidation processes, are discussed, shedding light on their effectiveness in removing harmful constituents from slaughterhouse wastewater.

We spotlight GI Aqua Tech's unique G-NANO System—a technology-driven solution tailored to the specific demands of slaughterhouse wastewater treatment. This system outperforms conventional methods by employing a primary and secondary treatment process that integrates the G-NANO agent, resulting in a removal efficiency of up to 90% of Biochemical Oxygen Demand (BOD). The system's cost-effectiveness, flexibility, energy efficiency, and small footprint make it a compelling solution for slaughterhouses seeking to comply with environmental regulations and reduce their impact on the environment.

In conclusion, this report provides valuable insights for stakeholders in the slaughterhouse industry, offering a comprehensive overview of wastewater treatment challenges and presenting sustainable, effective solutions for meeting these challenges head-on. It is a testament to the ongoing technological strides that pave the way for a cleaner, healthier future.

Introduction

WWT AT SLAUGHTERHOUSES
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The meat processing industry plays a pivotal role in our food production system, overseeing the processing and packaging of animal-based products. However, this vital industry also yields considerable wastewater, often laden with pollutants such as bacteria, animal waste, and blood.

A specific challenge within this sector is the effective treatment of wastewater produced in slaughterhouses. These facilities generate vast quantities of wastewater containing blood, feces, and other organic matter. Without appropriate treatment, this waste can potentially create environmental pollution, including surface and groundwater contamination.

The treatment of wastewater within slaughterhouses generally entails a multi-tiered process encompassing pre-treatment, primary treatment, secondary treatment, and occasionally advanced treatment. Pre-treatment usually involves the extraction of larger debris, including bones and hair. The primary treatment phase includes the removal of suspended solids and grease using techniques such as screening, sedimentation, and skimming. The secondary treatment primarily employs microorganisms to decompose the remaining organic matter. Advanced treatment methods are employed to eliminate residual pollutants and disinfect the wastewater.

Despite these comprehensive treatment processes, the meat processing industry remains a notable contributor to water pollution. Subpar treatment and disposal of slaughterhouse wastewater can trigger significant environmental and public health issues. Consequently, it is crucial for the industry to persistently enhance its treatment methods and for regulatory bodies to enforce stringent regulations to ensure proper wastewater treatment in slaughterhouses.

Regulations regarding wastewater treatment in slaughterhouses vary depending on geographic location and the specific laws and regulations in effect. For instance, in the United States, the Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) program govern the discharge of pollutants from slaughterhouses into surface waters. The United States Environmental Protection Agency (EPA) establishes standards for pollutant discharge and grants permits to facilities that discharge wastewater.

Non-compliance with these regulations can result in substantial fines and penalties for slaughterhouses and reputational damage. Furthermore, discharging untreated or inadequately treated wastewater can detrimentally affect the environment and human health, potentially leading to the spread of disease and water resource contamination. As such, it is vital for slaughterhouses to understand and adhere to the relevant regulations to mitigate potential risks associated with non-compliance.



Problems

Unraveling the Complexity of Wastewater Challenges in Slaughterhouses

Wastewater generated by slaughterhouses carries an array of pollutants, inclusive of blood, fat, grease, and chemicals deployed in the sanitation process.

These pollutants can negatively affect the environment and local water systems if not effectively treated before release. Furthermore, slaughterhouses frequently produce vast volumes of wastewater, which can overwhelm treatment facilities, potentially releasing untreated or partially treated water into the environment. Slaughterhouses also generate solid waste, such as animal carcasses and by-products. If mismanaged, these pose risks to environmental integrity and public health. Hence, the efficient handling of both wastewater and solid waste from slaughterhouses is a critical public health and environmental concern.

The operation of Wastewater Treatment Plants (WWTPs) in slaughterhouses presents numerous challenges, chief among them being the high levels of organic matter, the presence of pathogens, and the necessity for efficient solids handling. If these challenges are not adequately addressed, they can result in poor treatment efficiency, escalating costs, and potential environmental hazards.

To ensure that treated water conforms to regulatory standards and does not harm the environment, effective operation and maintenance of slaughterhouse WWTPs are vital. Here's a summary of some of the key challenges:

High Maintenance Costs

The high concentration of grease, oils, proteins, fat, and other organic compounds found in wastewater from slaughterhouses necessitates specialized treatments and materials such as filters, chemicals, and additional equipment to manage the wastewater, leading to high costs effectively.

Pathogens and Diseases

Wastewater generated at slaughterhouses may carry pathogens and contagious diseases that pose severe risks to human and animal health, potentially leading to water pollution and widespread disease. Moreover, substandard slaughtering conditions and drainage systems in many slaughterhouses allow microorganisms to spread quickly in the environment.

Contamination

Chemicals, such as detergents and cleaning agents used in the slaughterhouse, can contaminate the wastewater, affecting the quality of the nearby water.

Pollution

Slaughterhouse wastewater, laden with pathogens, chemicals, fat, and oil, can seep into the environment, polluting water sources like rivers and streams, damaging aquatic life, and degrading water quality.

Odors

Wastewater produced in slaughterhouses can generate unpleasant odors, leading to air pollution and disturbances to neighboring residential or business areas.

CHALLENGES

Dissecting the Nature and Characteristics of Waste Generated at Slaughterhouses

Slaughterhouse waste is the by-product of activities related to the processing and butchering of animals, including livestock. The character of this waste varies widely and hinges on several factors: the species of animal being processed, the operational efficiency, animal sorting, the animal's size and weight, operational practices, and waste disposal methods.

OWING TO THE EXTENSIVE DIVERSITY IN WASTE TYPES AND COMPOSITIONS, THERE IS NO "STANDARD" SLAUGHTERHOUSE WASTE. INSTEAD, WASTE IS GENERALLY SEGREGATED INTO FOUR PRIMARY CATEGORIES:

Blood and Blood Products

1 Blood, collected during slaughter and stored in tanks before disposal, is characterized by high nitrogen levels and is rich in phosphorus, potassium, and carbon.

Animal Viscera and Associated Parts

2 Slaughterhouses generate unusable materials such as hides, offal, and bones during the slaughtering process. Offal, comprising body parts like internal organs, lungs, intestines, etc., represents the most abundant waste stream. Hides consist of hide, collagen, and fat and can be processed into leather. Bones, rich in calcium and minerals, can produce oil and fertilizer.

Industrial Wastes

3 Slaughterhouses also generate industrial wastes, including wastewater and sludge from cleaning, cooling, and other processing activities, as well as oils and greases stemming from maintenance and repair work.

Sanitary Wastes

4 Sanitary waste generated from restrooms, employee change areas, and other parts of the slaughterhouse can include substances such as soaps, cleaning and sanitizing agents, and other potentially hazardous materials.

Diving into the Complex Composition of Wastewater Generated at Slaughterhouses

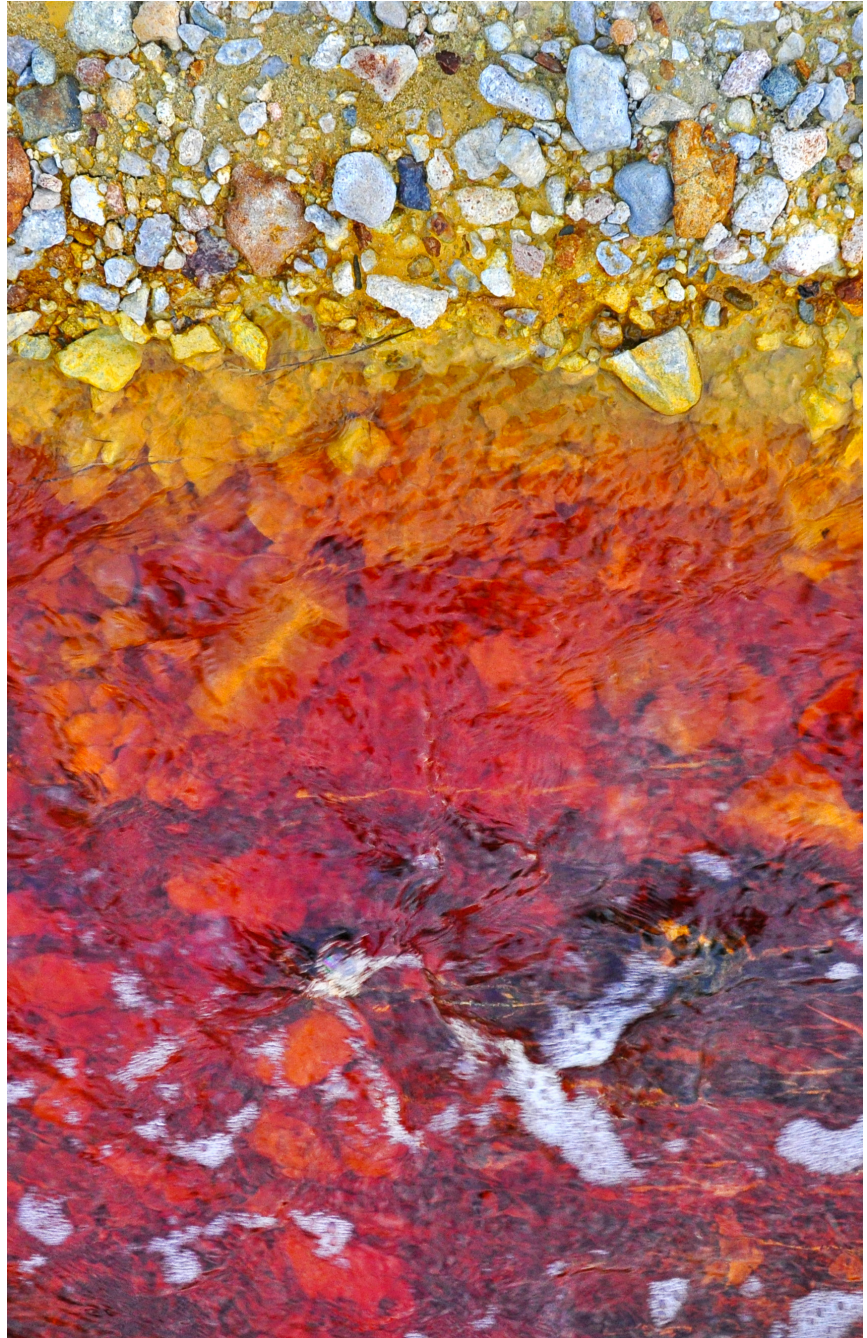
The wastewater generated at slaughterhouses is typically a cocktail of animal blood, fats, grease, proteins, dirt particles, and other organic matter, all mixed with water. Such wastewater is generally highly contaminated, characterized by a high biochemical oxygen demand (BOD) and chemical oxygen demand (COD). Often, it contains elevated levels of pathogens such as *Escherichia coli*, viruses, nematodes, and parasites. Due to volatile compounds like sulfur compounds, amines, and phenols, the wastewater typically exhibits a low pH and an unpleasant odor. Moreover, due to solid particles, the wastewater may exhibit high viscosity and be prone to fouling.

The characteristics of slaughterhouse wastewater can vary widely, dependent on the types of animals processed, the size and nature of the processing plant, and the waste disposal methodology employed. Broadly speaking, slaughterhouse wastewater is marked by a high biological oxygen demand (BOD), significant levels of suspended solids, a high chemical oxygen demand (COD), extensive total suspended solids (TSS), and a relatively high pH.

During the slaughter process, wastewater usually collects high concentrations of organics, including proteins, carbohydrates, lipids, and fats. These organics, found in significant concentrations, can considerably boost BOD and COD. Furthermore, slaughterhouse wastewater is heavily laden with bacteria, viruses, and other pathogens, which can pose a health risk if not adequately treated and disposed of.

The high TSS levels result from solids like hair, bones, feathers, scales, and undigested food. These solids can lead to the fouling of wastewater treatment tanks and processes. Additionally, high TSS levels can affect water hardness and impede the efficiency of wastewater treatment.

The wastewater pH typically leans towards alkaline due to inorganic salts, primarily sodium and chloride ions. Regular monitoring of pH levels is necessary to ensure they do not exceed limits that could lead to pipes and other treatment equipment corrosion.



Finally, slaughterhouse wastewater often carries an array of pollutants such as heavy metals, inorganic chemicals, pharmaceuticals, and dyes. Removing these pollutants from the wastewater is imperative to safeguard against environmental contamination and water pollution.

Overcoming the Complexities of Treating Slaughterhouse Wastewater: The Uphill Battle Against High Levels of Organic Matter, Nutrients, and Pathogens

Characterizing Slaughterhouse Wastewater: Slaughterhouse wastewater represents a highly heterogeneous mix comprising various animal wastes, rendered materials, environmental particulate matter, and industrial chemicals linked to the processing. Several factors, including the level of blood and fat content, geographical location, type of animal slaughtered, seasonal variations, and operational system, sway the composition of this wastewater. Its main components encompass biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), total phosphorus (TP), ammoniacal nitrogen (NH₃-N), and various fatty acids, including lignin and lipids.



Wrestling with High Levels of Organic Matter

Slaughterhouse wastewater frequently contains heightened organic matter levels, including proteins, fats, and carbohydrates. These organic compounds can pose a formidable challenge to treat, primarily through conventional wastewater treatment processes. Advanced technologies such as anaerobic digestion and activated sludge have effectively reduced the organic matter loads in such wastewater.



Managing High Levels of Nutrients

Slaughterhouse wastewater typically contains an abundance of nitrogen and phosphorus. These nutrients can fuel the accelerated growth of algae and aquatic plants, culminating in problems such as oxygen depletion and fish die-offs. Specific treatment processes, such as reverse osmosis, can serve as viable solutions to mitigate the nutrient concentration in slaughterhouse wastewater.



Contending with High Levels of Pathogens

Many slaughterhouses discharge wastewater teeming with high levels of bacteria, viruses, and other pathogens. If left untreated, this could precipitate serious environmental and health problems. Various treatment technologies, including UV disinfection, chlorine disinfection, and filtration, have effectively curtailed the pathogen load in slaughterhouse wastewater.

Untangling the Costly Implications of Poor Wastewater Treatment:

Fines for Non-compliance, Business Disruption, and Adverse Impact on Local Communities and the Environment

The toll extracted by inadequate wastewater treatment can be astronomical, both financially and environmentally. Inefficient wastewater management poses significant health, societal, and ecological hazards, including pollution of water bodies, compromised aquatic life and ecosystem health, escalated public health risks, increased energy expenditure, and expensive cleanup or remediation efforts. Violating or exceeding local, state, or governmental regulations due to improperly treated wastewater can lead to substantial legal repercussions. Beyond these direct expenses, indirect costs may emerge in the form of productivity losses in fisheries, tourism, and other water-dependent industries, alongside a loss of public confidence in government and industry.

Fortunately, the financial burden of untreated wastewater can be mitigated through more efficient management, technological advancements, and heightened prevention efforts.



PENALTIES FOR NON-COMPLIANCE

In the absence of appropriate wastewater treatment, corporations may face hefty penalties from local, state, and governmental entities for regulatory breaches. This holds particularly true for industrial wastewater factories and other commercial enterprises' discharge. Fines can vary extensively, from thousands to millions of dollars, depending on factors such as **violation type, company size, and the severity of the offense.**



BUSINESS DISRUPTION

Inefficient wastewater treatment can lead to business shutdowns. Non-compliance with regulations and environmental pollution can result in the revocation of operational licenses, leading to **lost customers, revenue, and employment.**



ADVERSE IMPACT ON LOCAL COMMUNITIES AND ENVIRONMENT

Inadequate wastewater treatment can wreak havoc on the surrounding environment and communities. Wastewater, laden with harmful pollutants, can contaminate water bodies and soil, posing health hazards for humans and wildlife. Potential consequences include diminished crop yields, water shortages, and wildlife habitat degradation. Aside from environmental damage, inadequate wastewater treatment can also contribute to **high utility bills, health risks, and increased business costs.**

Emphasizing Compliance amidst the Rising Regulatory Scrutiny on Slaughterhouse Wastewater Treatment

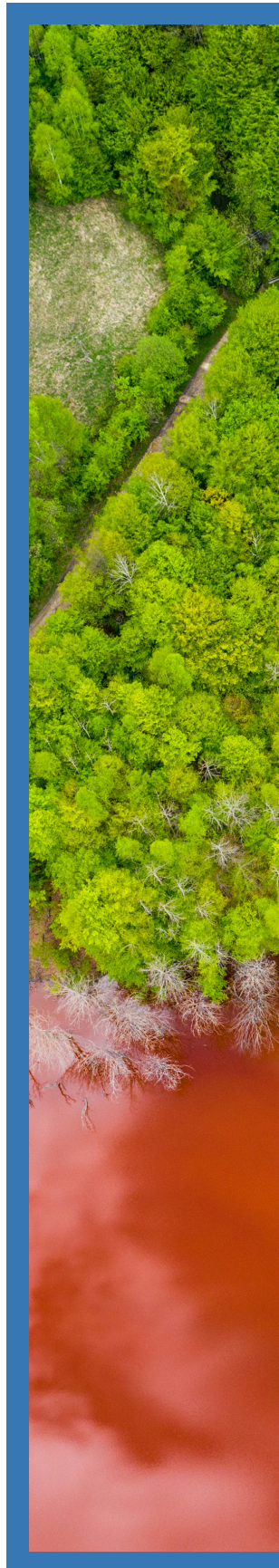
GIVEN THE ESCALATING CONCERNS AROUND ENVIRONMENTAL PRESERVATION, ANIMAL WELFARE, AND PUBLIC SAFETY, IT'S NO SURPRISE TO SEE A GROWING FOCUS ON COMPLIANCE IN SLAUGHTERHOUSE WASTEWATER TREATMENT.

As regulations tighten, it is paramount for slaughterhouses to stay abreast of prevailing guidelines, ensuring their wastewater treatment systems meet and exceed requisite standards. Emerging technologies are driving this change, offering efficient and cost-effective wastewater treatment solutions while satisfying the burgeoning demand for regulatory compliance.

The prevailing market trend underscores the need for compliance with increasingly robust environmental regulations. Slaughterhouse wastewater—a byproduct of producing animal proteins—houses a plethora of pollutants, including hormones, antibiotics, pathogenic microorganisms, and animal fats. These pollutants can inflict substantial environmental harm, contributing to water and air pollution and soil contamination.

In response, governments worldwide are enacting more stringent rules on slaughterhouse wastewater discharge. Many mandates that slaughterhouses treat their wastewater and routinely provide detailed quality reports to ensure ongoing regulatory compliance. These comprehensive reports must encompass information on wastewater quality, pollutant types, and steps taken by the slaughterhouse to diminish pollutant levels.

"Given the potential environmental harm these pollutants can cause, this trend towards greater regulation and scrutiny is crucial to mitigating water pollution, soil contamination, and air pollution."





Navigating the Challenges of Compliance to Safeguard the Environment and Public Health



Compliance requirements for slaughterhouses are intricate, demanding careful planning and the integration of advanced technologies to ensure efficacious wastewater treatment. It is incumbent upon slaughterhouses to adopt measures like establishing wastewater treatment facilities and utilizing sophisticated chemical and biological treatments to eliminate pollutants from their wastewater. Furthermore, the growing demand for supplier accountability in wastewater treatment and monitoring from supermarkets and restaurants increases pressure on slaughterhouses to meet these requirements or face the potential loss of significant business partnerships.



Predominantly, the market trend of amplified regulations and scrutiny in slaughterhouse wastewater treatment is motivated by the necessity to comply with escalating rigorous environmental standards. Though compliance presents challenges, it is indispensable for protecting the environment and public health. Therefore, slaughterhouses must ensure their wastewater quality, invest in advanced wastewater treatment systems, and adopt rigorous monitoring technologies to fulfill the expectations of government bodies, supermarkets, and restaurants.

Solutions

ELUCIDATING STANDARD PRACTICES
IN SLAUGHTERHOUSE WASTEWATER
TREATMENT: PRIMARY, SECONDARY,
AND TERTIARY TREATMENTS

A crucial point to note is that the characteristics of wastewater vary in accordance with the types of animals being processed. These include:



Beef Slaughterhouses:

These establishments primarily focus on cattle processing, including cows and bulls, among other bovine species.



Sheep and Lamb Slaughterhouses:

These facilities are dedicated to the processing of sheep and lambs, along with related species.



Poultry Slaughterhouses:

These facilities specialize in the processing of chickens, turkeys, ducks, and other varieties of poultry.



Goat Slaughterhouses:

These facilities are particularly designed for the processing of goats.



Classification of Treatment Methods



Chemical Processing: This methodology employs specific chemicals to alter the composition of wastewater, facilitating the separation of solid constituents from the water. The usual chemicals utilized in this stage are flocculants, coagulants, and pH regulators.



Physical Processing: Physical processing harnesses diverse mechanical procedures to segregate solids from wastewater. Standard techniques used at this stage encompass sedimentation, centrifugation, flotation, filtration, and clarifying systems.



Biological Processing: Biological treatment often complements physical processing. It involves the utilization of microorganisms to transform biological constituents within the wastewater into carbon dioxide and water. Predominant biological procedures used for this processing include activated sludge systems, aerated lagoons, oxidation ditches, and trickling filters.



Ultraviolet Processing: Ultraviolet processing is a typical disinfection strategy for treating slaughterhouse wastewater. This method doesn't introduce chemicals; instead, it employs UV radiation to exterminate any microorganisms in the wastewater.



Advanced Oxidation Processes: These processes are gaining momentum in wastewater treatment due to their high efficacy. These methods harness oxidation - via chemical agents or light exposure - to decompose contaminants present in the wastewater.



Standard Treatment Processes



Several distinctive methodologies are employed to treat wastewater from slaughterhouses, encompassing physical, chemical, and biological treatment processes.

Physical Processing: Techniques under this category, including sedimentation, filtration, and flotation, primarily focus on mechanically segregating solid components from wastewater.

Chemical Processing: This involves using specific chemicals through coagulation and flocculation to detach solids and pollutants from the water.

Biological Processing: This strategy entails using microorganisms to decompose organic waste in the water. Anaerobic digestion and aerobic digestion are two popular biological treatment techniques employed for slaughterhouse wastewater treatment. While anaerobic digestion leverages microorganisms that flourish in an oxygen-devoid environment to break down the organic matter, aerobic digestion utilizes microorganisms that necessitate oxygen for the same purpose.

Choosing the optimal treatment methodology for slaughterhouse wastewater depends on the unique characteristics of the wastewater, the intended treatment goals, and available resources. A comprehensive assessment of the wastewater is indispensable to designing an effective treatment system tailored to the facility's specific requirements.



A- Preliminary Treatment

This phase involves physical filtration of solids, sedimentation, and chemical precipitation to effectively remove suspended solids, oils, grease, and other chemical contaminants.

B- Intermediate Treatment

This process segment utilizes biological treatment methods such as aeration and oxidation to address wastewater components, implement activated sludge systems, and execute anaerobic digestion.

C- Advanced Treatment

This stage further refines the treated wastewater to meet discharge standards, targeting eliminating metals, phosphorus, and nitrogen compounds. It may incorporate advanced chemical treatment processes such as activated carbon, ion exchange, and reverse osmosis.



D- Disinfection

This crucial process neutralizes harmful microorganisms, thereby preventing potential disease transmission, using chemical disinfectants like chlorine, ozone, or ultraviolet light.



E- Resource Recovery

This phase recovers valuable constituents like phosphorus, nitrogen, and organic matter from wastewater, facilitating their reuse in fertilizers and other related products.



WE PROUDLY PRESENT OUR UNIQUE, TECHNOLOGY-DRIVEN TREATMENT SERIES KNOWN AS THE G-NANO SYSTEM, SPECIFICALLY TAILORED FOR SLAUGHTERHOUSE WASTEWATER.

Our system stands out from the competition, featuring flow equalization and our exclusive G-NANO reaction agent for oxidation and degradation. It also employs techniques such as encapsulation, adsorption, coagulation, and flocculation techniques. Depending on the complexity and size of the installation, nitrification, and denitrification are implemented, while an additional refinement stage may be required in line with effluent standards.

Distinct from conventional methods, our system embraces a two-step treatment process. It employs our G-NANO agent to eliminate suspended solids, oils, grease, and chemical impurities, boasting an impressive removal efficiency of up to 90% of BOD. Furthermore, a tertiary treatment stage employs activated carbon filters to eliminate metals, phosphorus, and nitrogen compounds, ensuring the treated wastewater adheres to discharge standards.

Our unique selling proposition (USP) resides in our technology's cost-effectiveness, energy efficiency, and environmental friendliness.

Capital expenditure for our solution is 30% less than competing systems, operational costs are 40% less, and the required space is 50% less. Moreover, the unique composition of our G-NANO agent facilitates resource recovery from produced sludge, making it available for various reuse applications.

Our process also presents a level of flexibility that can accommodate changes in future regulations or variations in source water quality.

Given its low power consumption, minimal carbon footprint, and independence from temperature fluctuations during the reaction process, our G-NANO technology is an eco-friendly and accountable choice for slaughterhouse wastewater treatment.

G-NANO



The path to a cleaner, more sustainable future in slaughterhouse wastewater treatment leads us to our pioneering technology - G-NANO. At GI Aqua Tech, we pride ourselves in creating solutions that meet current needs and anticipate future challenges. G-NANO encapsulates this vision and serves as a beacon of innovation and sustainability within our industry.



Designed with environmental responsibility at its core, the G-NANO system is a comprehensive, technology-based treatment series developed specifically for slaughterhouse wastewater management. It efficiently addresses the significant concerns tied to wastewater – from high levels of organic matter and nutrients to the presence of pathogens and various pollutants.

The G-NANO system employs flow equalization, a proprietary G-NANO reaction agent for effective oxidation and degradation of pollutants, capsulation, adsorption, coagulation, and flocculation. It accommodates a broad spectrum of slaughterhouses, from small installations that require nitrification to complex operations requiring denitrification and even those needing additional polishing stages to meet stringent effluent standards.

One of G-NANO's key strengths lies in its efficiency. It employs a primary and secondary treatment process that eliminates up to 90% of Biochemical Oxygen Demand (BOD) and effectively removes suspended solids, oils, grease, and chemical impurities. The system's tertiary treatment process goes a step further, utilizing activated carbon filters to meet discharge standards by eliminating metals, phosphorus, and nitrogen compounds from the wastewater.

However, our G-NANO system is not just about treatment efficiency. It's also a story of sustainability and adaptability. Compared to other traditional systems, G-NANO requires 30% less capital expenditure, reduces operational costs by 40%, and decreases the necessary footprint to meet current needs and easy adaptation to future regulations or changes in source water quality.

Moreover, G-NANO is energy-efficient and has a low carbon footprint. It operates unaffected by temperature variations, ensuring consistent performance in various environments. Thanks to the natural composition of G-NANO, even the sludge produced in the process can be reclaimed and reused in different applications.

We believe that the best solutions address current issues and pave the way for a sustainable future. G-NANO is our contribution to this journey - a solution for today with a vision of tomorrow.

Sample ID	3605	Sampling Date	28-02-2023
Receiving Date	28-02-2023	Matrix	Water
Reporting Date	22-02-2023	Sub-Matrix	Commercial Wastewater
Client Name	SI Aqua Tech - Sri Lanka	Collection Location	Pioneer Lab
Ref. By	Dr. Mahesh	Chain of Custody	SI Aqua Tech
Subject	Commercial Wastewater Analysis	Sample Taken By	Pioneer Lab
Project		Location	Shankar (Sri Lanka)

Analysis				
Test Name	Result	Unit	Methods	NCEC Ref. (A)
Chemical Oxygen Demand (COD)	34.00	mg/l	APHA 5540 C	< 1000.00
Total Suspended Solids (TSS)	32.00	mg/l	APHA 2540 D	< 600.00
Nitrogen, Total Kjeldahl (TKN)	< 1.00	mg/l	APHA 4500 N(org) C	< 120.00
Phosphate, Total	0.05	mg/l	SM 4500 PO ₄ -E	< 15.00
Oil & Grease	ND	mg/l	EPA 1664 B	< 100.00



Case Study

PIONEERING WASTEWATER TREATMENT IN SLAUGHTERHOUSES WITH GNANO TECHNOLOGY

CHALLENGE:

A seasoned significant increase in slaughterhouse activity, results in an unprecedented surge in wastewater production. Traditionally, this wastewater is stored in containers, causing chemical reactions, and then transported with trucks to various locations for treatment, leading to traffic congestion and increased carbon dioxide emissions. The need for an innovative, sustainable solution was clear.

SOLUTION:

Introducing the GNANO Technology:

At GI Aqua Tech, we introduced our revolutionary wastewater treatment mobile units powered by the world-first 100% nanotechnology. Our nanotech enhanced mobile unit is capable of treating 1000 cubic meters of wastewater per day. It promises not only the reuse of water but also to utilize the sludge in the wastewater as fertilizers, adding a unique sustainability dimension to the solution.

Fast and Efficient Solution:

Where traditional solutions took between 8-24 hours to finalize the wastewater treatment process, our solution brought this down to a mere 20 minutes. Despite the reduction in processing time, there was no compromise in the quality of treatment, as our units successfully met the criteria established by the client's country..

Sustainable and Economical:

Our solution proved to be 80% cheaper than traditional methods, not to mention a 75% reduction in energy consumption, with our units operating at only 0.17 kilowatts per cubic meter. Furthermore, our company assumed the responsibility of installation, relieving the slaughterhouses of any additional capital expenditure.

Compact, Quiet, and Odorless:

An often-overlooked aspect of wastewater treatment units is their impact on the surroundings. GI Aqua Tech's units occupy 10% of the space required by traditional methods and are designed to operate quietly and without odor.

Adaptable and User-Friendly:

Given the seasonal operation of slaughterhouses in our client's city, our team developed these units with adaptability in mind. They are easy to use - plug-and-play - and robust enough to handle variable operational schedules.

CONCLUSION

GI Aqua Tech's intervention is a testament to the transformative potential of innovative technology when guided by sustainability. With our wastewater treatment units, we have revolutionized the management of wastewater in slaughterhouses. The benefits have been multifold significant cost and energy savings, improved efficiency and environmental protection.

Our work in slaughterhouse wastewater treatment is a blueprint for how technology and innovation can effectively address complex, large-scale environmental challenges.



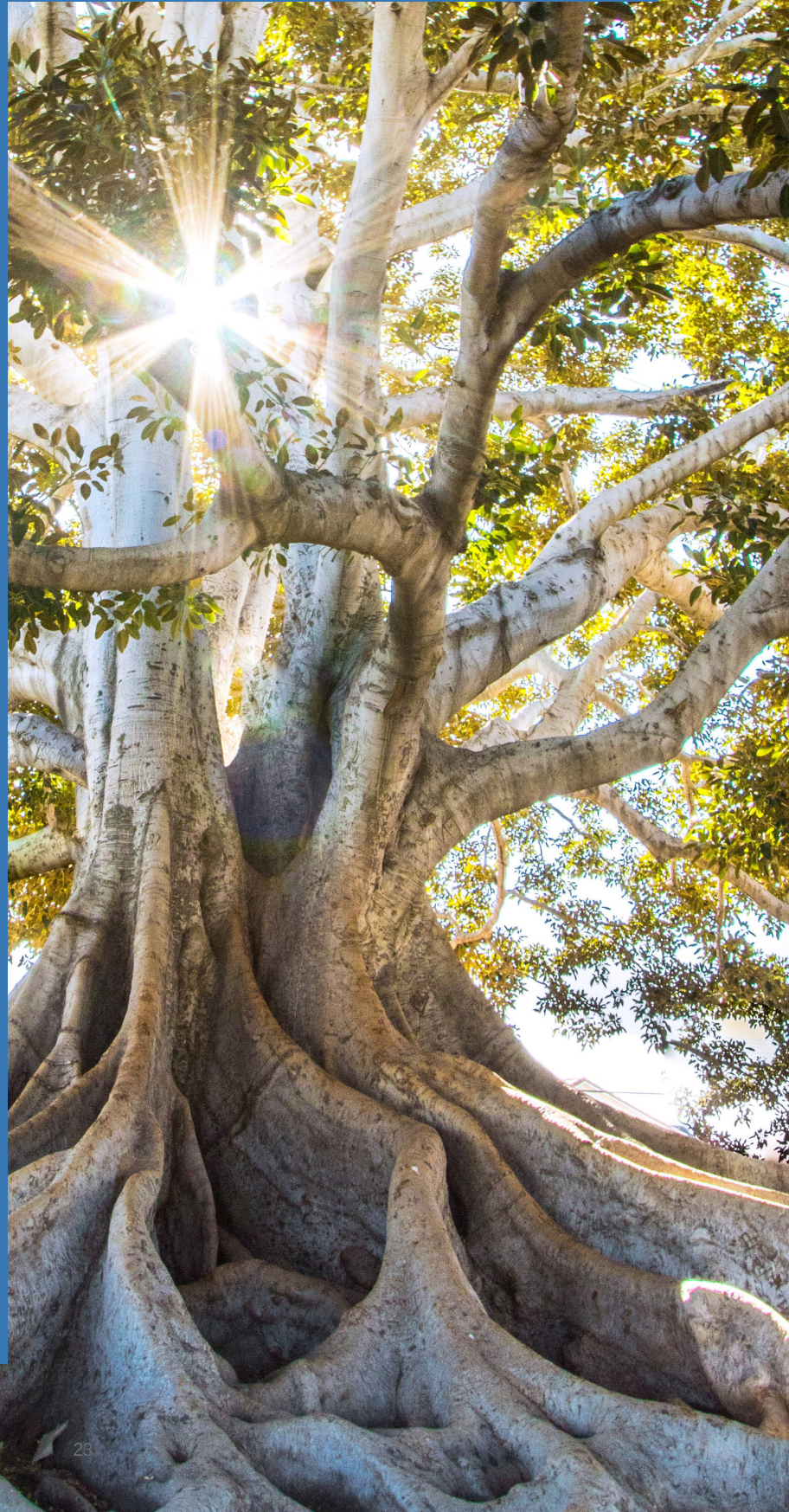
GI AQUA TECH: UNWAVERING COMMITMENT TO ENVIRONMENTAL SUSTAINABILITY AND PUBLIC HEALTH

Our commitment at GI Aqua Tech extends beyond mere financial gains. We recognize the immense value of safeguarding human health and the environment, a commitment that far outweighs any short-term benefits that may be attained by cutting corners.

At GI Aqua Tech, our core belief centers around serving the public interest, safeguarding human health, and protecting the environment. These are the most invaluable achievements that can be attained through our steadfast commitment to sustainable treatment standards.

In this era where we are all interconnected and reliant on limited resources, we must acknowledge that the damage we inflict upon these resources is indistinguishable from the risks we face as a result.

Assuming our responsibility and fulfilling our duty towards humanity and the environment should be our foremost priority. By elevating our level of responsibility towards all aspects of this industry, without solely focusing on the financial burdens it may entail, we can achieve long-term sustainability and profitability for all.



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GI Aqua Tech is a joint venture involving numerous multinational corporations and research institutes.

Our core mission is to provide innovative customized solutions for the wastewater industry by offering a new generation of wastewater treatment technology in industrial, gray water, slaughterhouse, petroleum, etc. We're committed to delivering groundbreaking solutions for wastewater management and pollution control. By developing these advanced, cost-efficient treatment products, we're not only opening up new markets but also promoting financially viable and truly progressive business opportunities.

Our goal is to expand the wastewater market, drawing interest from potential partners and customers who not only seek profitable ventures but also wish to achieve meaningful environmental and humanitarian impact. By leveraging our solutions, we offer the dual advantage of responsible water management and economic prosperity.

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