HLIS PROJECT

Intelligent Leak Detection in Tailings Ponds and Beyond

HLIS

"We are looking at an absolutely unique device, this unequalled level of technology, will probably revolutionize the industry."

J.H. Tak,
Expert on Leak Detection

EXECUTIVE SUMMARY

Tailings ponds present a massive challenge across a wide range of industries. As a product of industrial activities such as **mining and oil extraction** tailings and their management can have a severe impact on the **environment** as well as on the **reputation** of the operator. On the top of that a leaking tailings pond can have a significant negative impact on the **profitability of the industry participant** due to fines and lawsuits by NGOs and governments.

Typical leak detection procedure is time consuming, requires human presence in the toxic environment for extended periods of time and does not guarantee a successful outcome.

HLIS NOLOGIES LIMITED (HLIS) is an Irish company devoted to **high-tech solutions in the realm of intelligent leak detection** in tailings ponds and beyond. HLIS has developed a set of **intelligent autonomous robots** that use patent-pending 3D GPS eMapping technology enabling quick and systemic monitoring of tailing ponds of all sizes. The state-of-the-art software that powers the HLIS robots is backed by blockchain technology, thus enabling the survey data to be timestamped and stored for future references. Furthermore, blockchain also powers the service delivery relying on HLIS 's own cryptocurrency called HLIS token. While **eLagoon** and **eRover** robots are suitable mostly for large scale operations, HLIS has also developed **eRaptor** that is also suitable for smaller projects such as roofs and swimming pools.

This unique Hardware-as-a-Service solution facilitates both quick end efficient leak detection, as well as production of evidence for compliance purposes.

Target customers for the HLIS Project are industry operators involved in large-scale operations that require tailings ponds with geomembranes. Taking in the account the facts that over 250 million square meters of geomembranes are produced each year and that the global geomembrane market is expected to reach nearly $4 billion by 2022, the target audience is abundant.

The team working on the HLIS Project consists of industry experts, IT experts, academics and mechanical engineers with more than 25 years of experience in the leak detection industry.

HLIS is already **present on the global market** and supported by branches

in Ireland, Israel, South Korea, Czech Republic and Slovakia.

HLIS PROJECT

CHALLENGE

Any solid waste that cannot be recycled usually ends up in a landfill where it can be stored in a relatively safe manner. On the other hand liquid waste has to undergo a different treatment. Due to lack of other options, liquid industrial waste often ends up in retention basins, eLagoons and reservoirs (below only as **'tailings ponds'**).

Waterproof geomembranes are used to prevent any leakage of harmful substances from tailings ponds into the environment. Even though materials out of which waterproof geomembranes are made, such as high-density polyethylene (HDPE), have high impermeability and chemical resistance, their mechanical capabilities are relatively weak. This leads to significant risks for the integrity of geomembranes. That is why geomembranes often develop tears and other faults that cause the stored liquid waste to leak into the surrounding, thus contaminating the ground water and causing potential liabilities for the operator. Unattended leaks create unnecessary environmental, regulatory and economic risks. Dealing with leaks in tailings ponds has been a significant challenge for the industry operators for decades.

For the geomembranes to perform as required, faulty seams, holes and tears must be kept to a minimum during the various stages of the geomembrane lifecycle. This is particularly hard during manipulation, transportation and installation stages.

Geomembrane lifecycle
illustration

PRODUCTION

STORAGE

MANIPULATION

TRANSPORTATION

INSTALLATION

USE

5
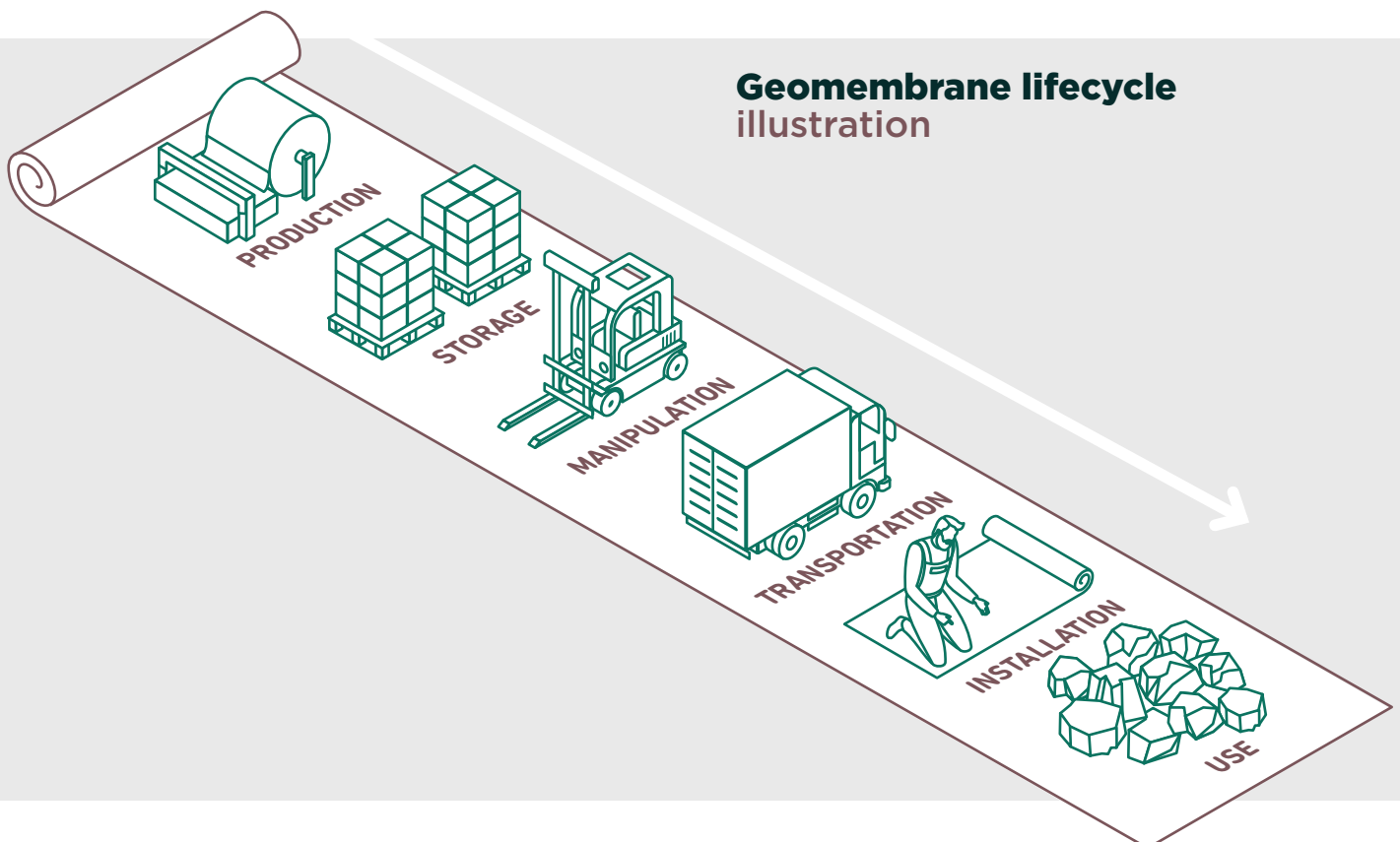
Today leak detection relies on relatively primitive traditional methods performed manually. This is time-consuming, involves human error factor and often causes leaks to be detected too late after a substantial contamination already occurred.

The most widely known and used method of testing the tightness of waterproof geomembranes is the electrical leak location method, adopted in 2015. The American standard ASTM D6747-15: Standard Guide for Selection of Techniques for Electrical Leak Location of Leaks in Geomembranes is used by numerous countries which have incorporated the American approach into their legislation.

"Leaks due to membrane damage caused by storage, manipulation or installation can have far-reaching consequences once the geomembrane is installed and used."

The principle of the test is based on an artificial electric field, which is created and measured above and below the membrane. Based on this, the measuring device can observe changes in the field, thus identifying the location of the leak. Both uncovered geomembranes, as well as those covered with a protective layer, can be inspected by this method. Nevertheless, this method is highly inefficient because it has to be performed manually by technicians.

SOLUTION (PRODUCT)

In HLIS   we know that leak detection in tailings ponds with geomembrane

can be **quicker, safer, cheaper and more transparent.** It is time to use the available scientific and industry knowledge of the 21st century and utilize it in the leak detection process.

A combination of state-of-the-art technology with industry know-how enabled HLIS   to create **a line of intelligent fully autonomous robots that**

use patent-pending 3D GPS eMapping technology. These robots are robust enough to operate in toxic areas that are otherwise inaccessible to humans and can work nonstop both on water and land. These devices revolutionize conventional industry techniques where leak detection is still performed manually by humans.

TECHNOLOGY – HARDWARE

INTRODUCING HLIS ROBOTS

HLIS has developed a set of three different robots that cater for different leak detection situations.

1. eLagoon

eLagoon robot is the only device on the market able to perform measurements on a **filled toxic tailings pond.** Unlike our competitors, who have to empty the pond prior to measuring, eLagoon device can operate in any liquid, be it water, acids or toxic substances, and it is suitable for all kinds of environments, such as eLagoons, liquid landfills, mines and water reservoirs.

eLagoon is equipped with 3D GPS eMapping technology, allowing a fully automated monitoring of any liquid toxic environment, even those with multiple geomembranes. GPS navigates its measurement root and the results of the measurements are logged into an immutable record on blockchain.

The eLagoon robot can perform measurements at a speed of 1 sq. meter per second and is able to find even the smallest tears in the geomembrane. eLagoon robot provides the most accurate solution on the market for measuring geomembrane tightness in a liquid environment.
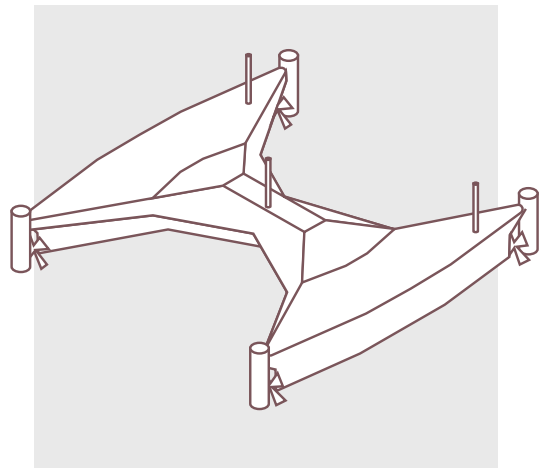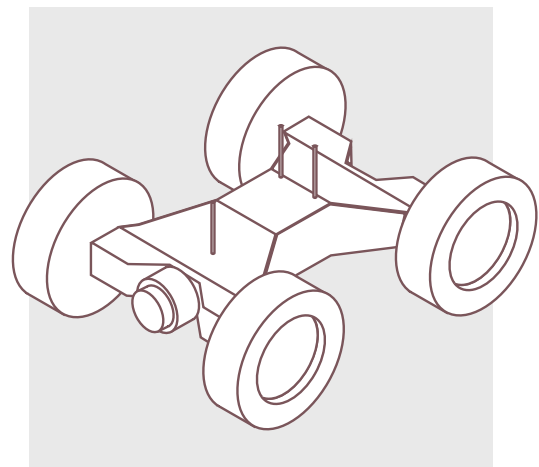
2. eRover

eRover is the only fully programmable and autonomous robot on today's market able to monitor **covered geomembranes.** eRover has a measurement speed of 0.5 sq. meter per second and can find the tiniest tears in a geomembrane.

With the ability to measure under a great variety of surfaces such as soil, sand, gravel and clay-loam, eRover is perfect for monitoring geomembranes that technicians are unable to access safely.

Equipped with 3D GPS eMapping, eRover is fully automated and reports its measurements directly to blockchain. eRover allows our customers to save a lot of time and costs.

3. eRaptor

Some projects may be too small for the eRover or eLagoon. Nevertheless, ensuring a geomembrane is ready for use after installation is an essential matter that must not be neglected in any project. eRaptor is an arc-tester capable of detecting any damage on **uncovered geomembranes.** Be it smaller projects such as flat roofs, or swimming pools or very large projects such as landfills or tunnels eRaptor is the right tool for the job.
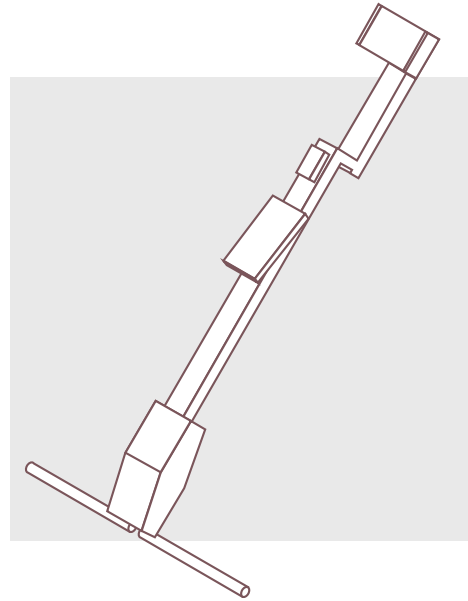
eRaptor features a safety handle, a lightweight yet powerful battery hidden within the device and is equipped with state-of-the-art 3D GPS eMapping technology thus allowing it to precisely navigate and pinpoint the exact leak locations even on the extremely large areas.

TECHNOLOGY – SOFTWARE

INTRODUCING 3D GPS eMapping

As a direct result of years of research and development, HLIS nologies has revolutionized the outdated and ineffective techniques and technology used in the leak detection industry today by creating a smart technological solution called 3D GPS eMapping.

3D GPS eMapping is a patent pending, intelligent system of specially designed sensors and electronic features. The system autonomously navigates the robot during the process of survey of the selected location and gathers spatial readings of the electric field potentials as well as GPS coordinates. Data are interpreted by a neuron network and are logged onto blockchain, thus creating indisputable proof of the measurement, its parameters and its outcomes. 3D GPS eMapping fully automates the process of monitoring and analysing data through the use of drone technology, GPS mapping and AI algorithms.

Every HLIS   device is equipped with the 3D GPS eMapping technology.

3DGPS
eMapping

INTRODUCING BLOCKCHAIN AND HLIS TOKEN

Blockchain technology is changing the way entire industries operate and the leak detection industry is no different.

In essence blockchain enables the creation of immutable record with timestamp that can prove the existence of some event at a certain point of time. In the realm of leak detection, blockchain can be used to prove the execution of a leak detection survey and its results to any relevant authorities. Blockchain thus provides a new form of an immutable certificate. Offering this technology to our clients is a huge step forward in the leak detection industry.

The business model of HLIS is based on the provision of services to clients (Hardware-as-a-Service). All hardware remains the property of HLIS . To use the hardware, the client must use the HLIS Platform.

HLIS Platform is an online interface through which clients can use the services of HLIS . In order to purchase services on the HLIS platform, the client must possess XLS (HLIS Token). XLS is a medium for payment for services on HLIS Platform. XLS tokens can be purchased directly from
HLIS or from a public exchange After XLS token purchase, these can be used for the payment for any services available via the HLIS Platform.

HLIS token is an Ethereum based token that complies with the ERC-20 standard. The total token supply is 200,000,000. Since 4Q/2018 HLIS NOLOGIES LIMITED has been doing an ongoing pre-sale of the tokens.

Token Overview

Token Name	⟶	HLIS Token
Token Symbol	⟶	XLS
Token Supply	⟶	200,000,000
Protocol	⟶	ERC-20
Accepted Currencies	⟶	ETH, BTC, FIAT
Direct Listing	⟶	Q4 2024 – Q1 2025

THE MAIN ADVANTAGES OF HLIS AUTONOMOUS ROBOTS SQUARE DESIGN:

1. *Can monitor remote areas that are difficult to reach.*

2. *Autonomous navigation using GPS without the need for direct oversight.*

3. *Data confidentiality: robot, unlike human staff, is completely discreet. It will not disclose any information to third parties that could result in bad publicity. Only robot and client know about the leaks found. Client can access the survey results through a private client zone. Leaks are not recorded onto a public blockchain.*

4. *eRover robot passes on average 0.5 sq. meter in 1 sec, thus covering 43,200 sq. meters in 24 hours. This is nearly 6-times faster than any traditional leak detection method, with no additional cost for a technician. This results in significant time and cost reduction for the client.*

5. *The eLagoon robot can measure 1 sq. meter per sec, thus covering 86,400 sq. meters in 24 hours .*

6. *Unlike humans, robots can also perform monitoring activities in poor weather & climate conditions as well as during the night-time.*

7. *Thanks to the built-in GPS tracker and certificates issued on the blockchain, the client can be certain that every sq. meter had been analysed after a survey had been performed.*

8. *In the future, client can prove to the relevant authorities that a survey had been performed thanks to the immutable record on the blockchain.*

LEAK DETECTION PERFORMED BY TECHNICIANS VS HLIS   ROBOTS
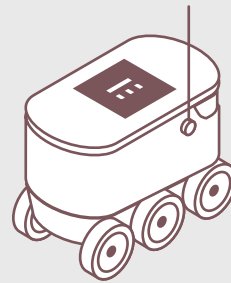
LEAK DETECTION PERFORMANCE	HLIS ROBOT	HUMAN TECHNICIAN
NON-STOP OPERATIONS 24/7	✔	✖
FILLED LAGOON	✔	✖
TOXIC ENVIRONMENT	✔	✖
INACCESIBLE AREAS	✔	✖
GPS PRECISION	✔	✖
VERIFIABLE DATA	✔	✖

OPPORTUNITIES IN THE LEAK DETECTION INDUSTRY

Despite the increased need for a speedy leak detection service, all surveys in the industry are still performed manually by technicians, thus making them inefficient, costly and without a guarantee that the entire area had been properly surveyed.

Most competitors are still using systems based on an analog model, which reduces the efficiency and precision of the survey process.

HLIS has developed a brand-new system based on more than 25 year experience in the leak detection industry that provides a state-of-the-art combination of hardware and software. HLIS brings to the market a revolutionary product that will change the entire industry. The most attractive features of the HLIS Project:

- ■ *Cost and time saving. HLIS robots can work faster and cheaper than the traditional technicians.*

- ■ *Automation of the leak detection process. By removing the human element HLIS is able to offer faster, more reliable and cheaper solutions for its clients. A monitoring process which in the past could only be done when a technician was present is now fully automated.*

- ■ *More precision. Introduction of the 3D GPS eMapping that revolutionizes the quality of the results, pinpointing the leakage and introducing objectivity to the measured results.*

- ■ *Unrivalled access capabilities. Areas which once proved challenging to monitor can now be surveyed as easily as any other, regardless of the environment.*

- ■ *Elimination of environmental risks. Shortening of the time necessary for the leak detection saves the environment.*

- ■ *Reduces the risk of injury to personnel. HLIS robots are fully certified.*

- ■ *Reduces regulatory risks. Blockchain provides immutable records of each and every survey, thus proving client's compliance.*

ABOUT HLIS TECHNOLOGIES LIMITED

HLIS NOLOGIES LIMITED (HLIS) is an Irish company devoted to high-tech solutions in the realm of intelligent leak detection in tailings ponds and beyond.

Established in 2018 by a team of leak detection professionals, HLIS brought together industry experts, IT experts, academics and mechanical engineers who have been working together to revolutionise the leak detection methods used today. Thanks to successful management and 25 years of experience in the industry HLIS   was able to transform the know-how and skills of its team into superb products that bring more efficiency and cost effectiveness into the realm of leak detection.
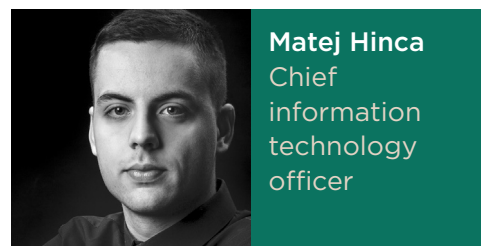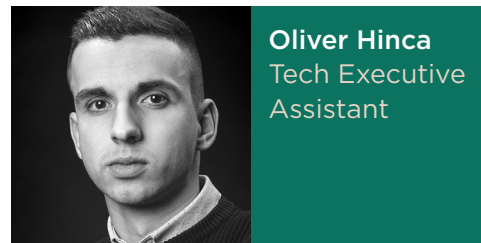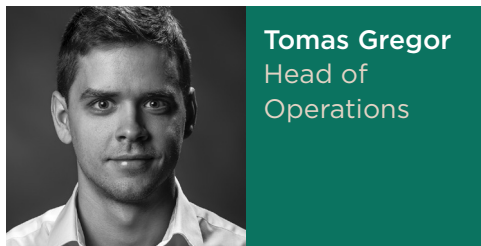
Target customers for HLIS   are industry operators involved in large-scale operations that require tailings ponds with geomembranes. Taking in the account the facts that over 250 million square meters of geomembranes are produced each year and that the global geomembrane market is expected to reach nearly $4 billion by 2022, the target audience is abundant.

HLIS   is already present on the global market and supported by branches

in Ireland, Israel, South Korea, Czech Republic and Slovakia.

TEAM

RNDr. Tomas Gregor PhD
Chief Technology officer

Majo Miklas
Chief Strategy Officer

Tomas Gregor
Head of Operations

Michail Sapiro
Head of Sales

Katarina Kaprinay
Chief system engineer, code developer

Zuzana Gregorova
Executive Assistant

Ivan Kovac
Composite Engineer/Frame Designer

Oliver Hinca
Tech Executive Assistant

Ing. Stanislav Zeman
Chief Engineer

Matej Hinca
Chief information technology officer

Frantisek Kudlacak
Software Developer Engineer

ADVISORS

Peter Dalik
Chemical
Engineer

**Prof.
Milos Karous**
Professor of
Geophysics

Juraj Bednar
Blockchain and
Smart Contract
Advisor

**Prof.
Jan Ilavsky
PhD**
Professor of
Chemistry

LEGAL DISCLAIMER

GENERAL DISCLAIMER

ANY INFORMATION IN THIS WHITE PAPER IS GIVEN FOR GENERAL
INFORMATION PURPOSE ONLY AND HLIS NOLOGIES LIMITED
DOES NOT PROVIDE ANY WARRANTY AS TO THE ACCURACY AND/OR
COMPLETENESS OF THE INFORMATION CONTAINED HEREIN.

Taking into account the lack of crypto-token regulation in the most
countries, each buyer is strongly advised to carry out a legal and tax
analysis before any purchase of HLIS   Token in the place of the requisite
tax residency.

This White Paper must not be considered as an invitation to enter into
an investment. This White Paper must not be considered as an offering
of securities in any jurisdiction. The White Paper does not include
nor contain any information or indication that might be considered
a recommendation. This White Paper does not constitute an offer or
an invitation to sell shares, securities or any rights belonging to HLIS
NOLOGIES LIMITED or any related or associated company. The HLIS
Token is a utility token, which can be used solely on the HLIS   Platform,
and is not intended to be used as an investment.

HLIS TOKEN

HLIS Token does **not have the legal qualification of a security,** since the token **does not** represent a voting right, equity interest, a profit sharing right, a claim to a note or other economic and/or other rights traditionally associated with a security. HLIS Token is intended solely to be used as a method of payment for the services rendered by the hardware (robots) of HLIS NOLOGIES LIMITED on the HLIS Platform.
The sale of HLIS Token is final and non-refundable. HLIS Token cannot have a performance or a particular value outside the HLIS Platform. HLIS

Token must not be used or purchased for speculative or investment purposes.

SOPHISTICATED KNOWLEDGE REQUIREMENT

Participation in any token sale can be highly speculative and could involve a risk of significant loss. Anyone purchasing HLIS Token must carefully review this White Paper and fully understands the risks, costs and benefits associated with the purchase of HLIS Token. The purchaser of HLIS Token must understand and have significant experience with cryptocurrencies, blockchain systems and services, and must fully understand the risks associated with HLIS Token as well as the mechanism related to the use of cryptocurrencies (including storage). HLIS NOLOGIES LIMITED shall not be responsible for any loss of HLIS Token or situations when it is impossible to access HLIS Token, which may result from any actions or omissions of the user or any person undertaking to acquire HLIS Token, as well as in case of cyber-attacks. Acquiring HLIS Token and storing it involves various risks, in particular the risk that HLIS NOLOGIES LIMITED may not be able to launch any/some of its operations, fully develop its blockchain and provide the promised services. Therefore, any potential buyer should carefully consider the risks, cost and benefits of acquiring HLIS Token prior to acquiring such token and if necessary obtain independent advice from blockchain professionals, accountants, tax advisors and/or lawyers. Any person who is not in the position to accept and understand the risks associated with the HLIS Token must not purchase HLIS Token.

FORWARD-LOOKING STATEMENTS DISCLAIMER

Forward looking statements are subject to risks and uncertainties which could cause actual results to differ materially from those anticipated. Such statements are based on management's beliefs and assumptions which are founded on information currently available to the management. Readers are cautioned not to place undue reliance on these forward-looking statements.

HLIS NOLOGIES LIMITED

10 McCurtain Hill
Clonakilty
Co. Cork
P85K230
Ireland

26 Upper Pembroke Street
Dublin 2
D02 X361
Ireland