



31 October 2023

ASX:14D

## September 2023 Quarterly Activity Report

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### Highlights:

- Application submitted to Electranet for Aurora Energy Precinct to connect to the 275kV transmission line, enabling progress toward revenue generation
- SiBox Demonstration Module successfully commissioned in August 2023 with significant milestones achieved during continued testing, including successfully maintaining a consistent 900°C outlet temperature over extended periods
- Existing shareholders subscribed \$1.471 million in an entitlement offer during the quarter, primarily to accelerate product development for the commercialisation of the SiBrick™ and SiBox® products

**1414 Degrees Ltd** ("1414 Degrees" the "Company") is pleased to release its Quarterly Report for the period ending 30 September 2023.

### Chairman's Letter

The quarter has been productive for your Company and our progress toward generating revenue. I am pleased to note significant progress for our Aurora project has enabled us to lodge the application to connect to the 275kV transmission line. The site that 1414 Degrees purchased in 2019 is shaping up as a significant renewable energy precinct hosting multiple generation and storage technologies providing system strength and grid stability services to the National Electricity Market (NEM) and powering the production of future fuels. In addition to the two-hour 140MW battery it also has approval for a 1414 Degrees thermal energy storage system with electric generator. A large SiBox charging system powering hydrogen and renewable fuel production, with or without electric generator, can provide significant frequency control ancillary services (FCAS) to earn revenue in the increasingly unstable national grid. This is a significant commercial opportunity for our Company.

We engaged London investment bank, Hannam & Partners, to advance the commercial prospects for the Company's technology. Their financial analysts assessed SiBox's contribution to the emerging long duration energy storage market, (LDES market) and in particular for the vital high temperature sector that comprises hard-to-decarbonise industrial processes. Hannam's analysts concluded that 1414 Degrees' technology had a significant growth trajectory in this market and their independent research note is available via the 1414 Degrees website.

Our membership of the HILT-CRC introduced potential industrial partners who provided data that allowed us to model the economics of introducing SiBrick heat storage into their processes. In industries such as aluminium production it shows our technologies could drastically cut emissions. But while it is clear that the technology could be deployed beneficially, it needs longer testing before it will be widely accepted into industrial plants. SiBox will be competitive where renewable energy is plentiful and gas pricing reflects carbon cost. The first requirement is to demonstrate reliability, for which we are planning a commercial pilot at scale. Our development agreement with Woodside Energy Technologies provides the option for Woodside to fund this next stage in order to earn up to 49% of the intellectual property. The Company has therefore been assessing potential sites in industrial plants, utility company electricity generation facilities, and, of course, on our Aurora project north of Port Augusta. Both the latter sites provide connection to high voltage electricity transmission to store and generate electricity, while supplying heat energy for future fuel developments including hydrogen or methanol. Aurora also has approval for 70MW of solar photo voltaic (PV) generation that could be used behind the meter or on the NEM.

Going forward with these commercial scale projects relies on the continuing excellent performance of our storage in the SiBox Demonstration Module and the development of lower cost SiBrick media. During the quarter we announced that we were in partnership with a global refractory manufacturer with the aim of mass production trials. Development in Germany has been slower than we anticipated, so we are upgrading our research facility to accelerate the brick development process. Our workshop tours for shareholders provided an opportunity to see the SDM and discuss our commercial plans. Shareholders strongly supported a rights issue during the quarter, raising the necessary funds for us to expand facilities for SiBrick development.

Shareholders will understandably be keen to see our achievements reflected in the sharemarket. While the economic conditions are unfavourable, innovative technologies for net zero targets are attracting substantial private and public investment. Your team are actively engaged with our advisors to present to potential investors in the global market.

I look forward to reporting on a productive next quarter for shareholders.

Dr Kevin Moriarty  
Executive Chairman



Figure 1 1414 Degrees Shareholders touring the SiBox Demonstration Module

## Commercialisation Report

The Company's membership of the international long duration energy storage council (LDES) and our announcement of successful long duration heat output from the SiBox Demonstration Module (SDM) continued to generate interest from major companies looking to reduce their emissions. SiBox is demonstrating that it is possible to provide a reliable and stable heat stream which could augment or replace natural gas in these high temperature industries. A lack of awareness of the viability of high temperature solutions, even within the LDES, and low appetite for risk in operating industrial plants, will need to be addressed for successful commercialisation of any thermal storage technology. The Company's planned commercial pilot installation will therefore be crucial for demonstrating viability and risk reduction.

Your Company has been evaluating the business case in a variety of industries that have provided operational information and determined that industries such as alumina (the precursor for aluminium production) could substantially reduce both cost (depending on gas and carbon prices) and emissions with our technology. The business case is also positive for lower temperature process industries that use substantial amounts of natural gas and wish to cut emissions or rely on intermittent renewable electricity. There is more competition from other storage solutions in lower temperature industries, but the Company believes that it will be commercially important to have first mover status because operating risk is such a big consideration for operating plants. Our SDM is designed to provide this operating confidence. Drawing on experience with the Company's earlier silicon storage systems, 1414 Degrees is proving safe and reliable energy storage at temperatures up to 1500°C.

The Company is seeking an industrial partner for a pilot installation in an operating plant, however, an alternative is our Aurora project that was acquired, at least in part, as a site to build a pilot SiBox system to store and generate electricity. In addition to approval for 70MW of PV generation, the Aurora site has regulatory approval for a thermal energy storage system, and a SiBox could earn revenue from provision of frequency control ancillary services (FCAS) and system strength in the National Electricity Market. In the upcoming months, your Company intends to demonstrate the SDM's ability to provide FCAS. This initiative stems from conversations with industrial and energy firms who expressed enthusiasm for its potential not only in energy arbitrage but also in reducing operating expenses. While there is no current customer for the substantial heat energy on the Aurora site, a planned solar methanol production plant could be a possible customer in the medium term. However, 1414 Degrees has been assembling partners for an integrated hydrogen-SiBrick reactor project that would position the Company as producer of carbon free hydrogen. We calculate that the integrated reactor design will have substantially lower operating costs and higher efficiency compared to an electrolysis plant, in part because our SiBrick storage enables continuous operation from an intermittent electricity supply when NEM prices are low.

## SiBox® Development

Following successful commissioning as announced in August, Woodside contributed further funding and the SiBox Demonstration Module (SDM) is proceeding with operational testing to prove and evaluate robust performance of the patented SiBrick and SiBox technology.

During the quarter significant testing milestones were achieved, including successfully operating for long duration with an outlet temperature of 900°C, the upper limit of the SDM design specifications. This goal was initially difficult to attain during the commissioning trials due to an instrument error but has since been resolved.

The SDM has met project objectives, operating autonomously for several months with minimal disruptions requiring operator intervention. To date the SiBrick storage media has completed 97 latent heat cycles and is displaying performance within design expectations. Testing has confirmed the nominal design storage capacity of 1MWh-thermal at 850°C outlet temperature.

Charge-discharge cycle testing was completed at a range of outlet temperature setpoints from 700-900°C simulating conditions in high temperature industrial processes. Multiple tests were completed at each setpoint, with consistent results cycle to cycle. These results are illustrated Figure 1 below. Operating at lower temperatures enables the SiBox to provide additional energy from stored sensible heat in addition to the latent heat capacity, effectively increasing the relative energy density per SiBrick.

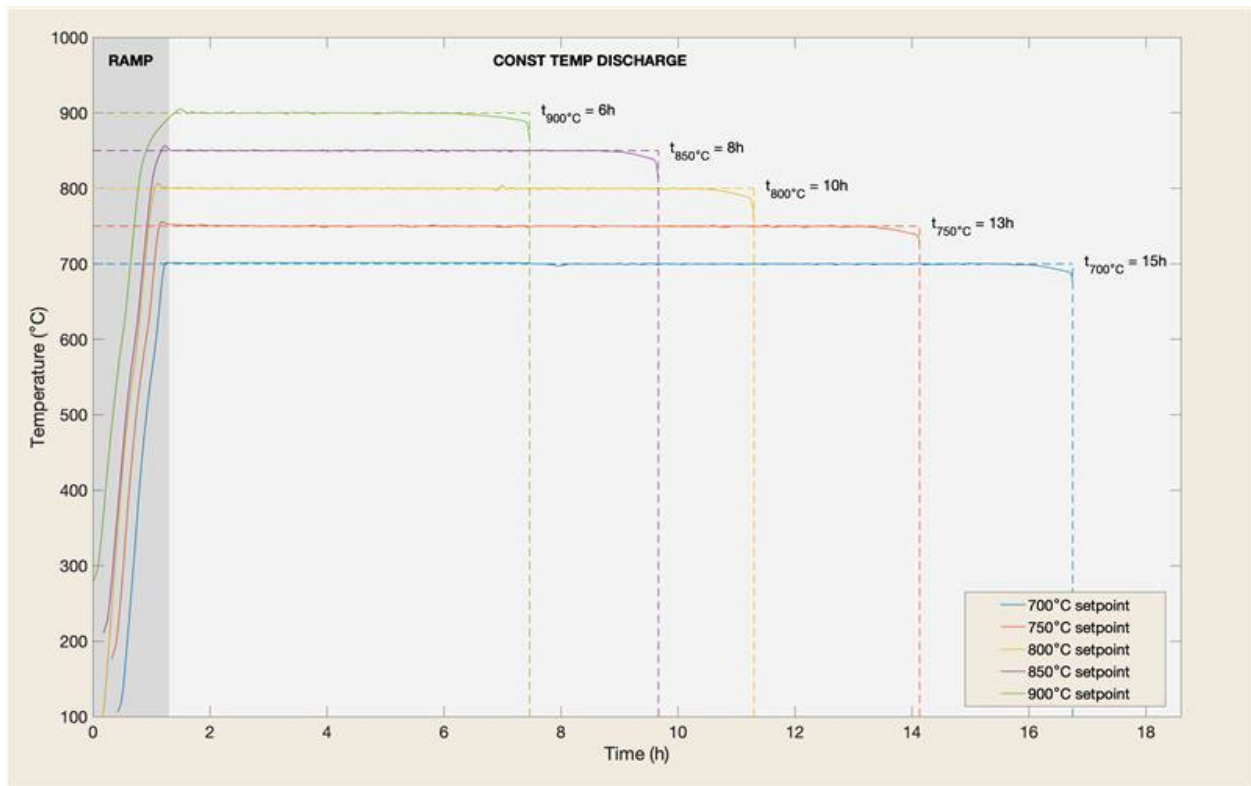


Figure 2 SiBox Demonstration Module showing long duration discharge from stored latent heat at various temperatures suitable for high temperature industry.

Engagement with industry partners has revealed that distinct industry sectors, and even specific plants within these sectors, have individualised demands for energy storage to best add value to their assets and operations. These tests showcase the flexibility of the SiBox storage to deliver consistent and clean high-temperature process heat. This adds value by lowering energy costs, but also reduces emissions, and increases process stability.

Further testing will provide additional data to quantify the SDM performance under variable operating conditions, as well as to demonstrate specific operating modes.



The SDM comprises a modular arrangement of SiBricks optimised for energy storage capacity and effective heat transfer from the heating system through to hot clean air to recover the heat on demand. The SiBricks are contained within an insulated heat store and integrated with an energy recovery system that simulates a commercial application process such as a gas burner replacement in an alumina calciner.

### SiBrick Development

1414 Degrees thermal storage media SiBrick™, exploits the very high latent heat capacity of silicon to provide a stable stream of energy from intermittent renewable electricity. SiBrick development is aiming for a low cost and mass-producible design, testing alternate silicon phase change media (that could reduce cost by up to 50%) and methods of fabrication of composite brick (according to the Company's pending patent). Following the successful capital raising in the quarter, the Company is now upgrading its facilities to accelerate SiBrick technology development.

Production trials with Refratechnik-Steel Gmbh are now expected to be run in early 2024, with the bricks then tested for durability and reliability in active airflow in the Company's Prototype device which has been in operation since 2016. The Prototype is being upgraded to automate charging and discharging, ready for operation by the end of the current quarter.

### Aurora Energy Precinct

SiliconAurora Pty Ltd (50:50 14D: Vast Solar) completed and submitted its application to connect a two-hour 140MW Battery Energy Storage System (BESS) to transmission provider Electranet, who will now undertake the process leading to a Transmission Connection Agreement (TCA). The BESS and other Precinct projects have received Development and Native Vegetation approvals from the South Australian Government. There is in-principle agreement with ARTC for access over the rail line, and other land agreements are well advanced. The large Precinct land holding operates under a 40-year Crown Lease.

The Aurora Precinct also has development approval for a pilot SiBox thermal energy storage generating 2MW of electricity, with space to expand storage and generation. With the transmission connection advancing, 1414 Degrees is assessing the technical specification for a SiBox pilot powering electricity generation and lower cost hydrogen production. Additionally, modelling shows that a SiBox thermal charging system could provide frequency control services (FCAS) to the NEM. FCAS can generate significant revenue as the penetration of renewables has increased.

### Corporate

London based investment bank, Hannam & Partners were engaged during the quarter to extend awareness of the Company and its technology in world markets. Their analytical team conducted an extensive consultation with the Company's technical team to prepare a research report on thermal energy storage markets and commercial prospects for the Company's technology. Going forward they are arranging presentations by 1414 Degrees to potential partners and investors.

Approximately \$1.5m was raised in a successful shareholder rights issue to fund further SiBrick development and to attract further grant funding, with the balance of up to \$3.1m mandated to Taylor Collison Ltd for placement to sophisticated investors and institutions on a best endeavours basis.





Shareholder tours of the SiBox Demonstration Module were conducted in August and September with good feedback from attendees.

A new phase of engineering operations commenced with the successful commissioning of the SiBox Demonstration Module. This new phase focuses on operational testing and data analysis. Some engineering staff were redeployed to assist, and a new senior engineer position created, with candidates currently being assessed.

The Company initiated recruitment of a Chief Engineer, primarily to lead the commercialisation of its technology. An appointment is likely to be made in the current quarter.

## Financial

Your Company ended the quarter with \$2.068 million in cash, an increase of \$119,000 from the previous quarter.

As required by ASX Listing Rule 4.7C3, the Company notes that \$82,000 was paid to related parties during the quarter. These payments were Directors Fees.

## AUTHORISED BY:

Dr Kevin Moriarty, Executive Chairman on behalf of the Board of Directors

For investor enquiries or further information, please contact:

info@1414degrees.com.au or +61 8 8357 8273

## ABOUT 1414 DEGREES LIMITED

1414 Degrees is an innovative clean energy company focused on the development and commercialisation of thermal energy storage solutions. Its proprietary silicon thermal storage, SiBrick™, is the key component in its SiBox® thermal energy storage solution. SiBox delivers high temperature carbon free industrial heat by harnessing silicon's extremely high latent heat capacity. This enables intermittent renewables to provide flexible, ultra-high temperature heat 24/7 for large industrial applications.

The Company commissioned a module of the SiBox technology in 2023 to accelerate the commercialisation of its silicon storage media as a competitive clean energy solution.

In 2019 the Company made the strategic purchase of the Aurora Energy Project (AEP) located near Port Augusta, South Australia. The project is a long-term renewable energy initiative to deliver reliable electricity to the region and National Electricity Market. The AEP has approval for 14D to pilot and demonstrate a large commercial scale version of the SiBox technology.

## Forward-looking statements

This announcement includes forward-looking statements which may be identified by words such as 'anticipates', 'believes', 'expects', 'intends', 'may', 'will', 'could', or 'should' and other similar words that involve risks and uncertainties. These forward-looking statements are based on the 1414 Degrees' expectations and beliefs concerning future events as at the date of this announcement. Forward-looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of 1414 Degrees, which could cause actual results to differ materially from such statements. 1414 Degrees makes no undertaking to update or revise the forward-looking statements made in this announcement to reflect any change in circumstances or events after the date of this announcement.

For more information, please visit [www.1414degrees.com.au](http://www.1414degrees.com.au)

## Appendix 4C

### Quarterly cash flow report for entities subject to Listing Rule 4.7B

**Name of entity**

1414 Degrees Limited

**ABN**

57 138 803 620

**Quarter ended ("current quarter")**

30 September 2023

<b>Consolidated statement of cash flows</b>	<b>Current quarter \$A'000</b>	<b>Year to date (3 months) \$A'000</b>
<b>1. Cash flows from operating activities</b>		
1.1 Receipts from customers	-	-
1.2 Payments for		
(a) research and development	(666)	(666)
(b) product manufacturing and operating costs	-	-
(c) advertising and marketing	(62)	(62)
(d) leased assets	(1)	(1)
(e) staff costs	(39)	(39)
(f) administration and corporate costs	(388)	(388)
1.3 Dividends received (see note 3)	-	-
1.4 Interest received	7	7
1.5 Interest and other costs of finance paid	-	-
1.6 Income taxes paid	-	-
1.7 Government grants and tax incentives	-	-
1.8 Other (provide details if material)		
- Partner project contributions	100	100
<b>1.9 Net cash from / (used in) operating activities</b>	<b>(1,049)</b>	<b>(1,049)</b>

<b>2. Cash flows from investing activities</b>		
2.1 Payments to acquire or for:		
(a) entities	-	-
(b) businesses	-	-
(c) property, plant and equipment	(1)	(1)
(d) investments	-	-

Consolidated statement of cash flows	Current quarter \$A'000	Year to date (3 months) \$A'000
(e) intellectual property	-	-
(f) other non-current assets	-	-
2.2 Proceeds from disposal of:		
(a) entities	-	-
(b) businesses	-	-
(c) property, plant and equipment	-	-
(d) investments	-	-
(e) intellectual property	-	-
(f) other non-current assets	-	-
2.3 Cash flows from loans to other entities	(136)	(136)
2.4 Dividends received (see note 3)	-	-
2.5 Other (provide details if material)	-	-
<b>2.6 Net cash from / (used in) investing activities</b>	<b>(137)</b>	<b>(137)</b>

<b>3. Cash flows from financing activities</b>		
3.1 Proceeds from issues of equity securities (excluding convertible debt securities)	1,471	1,471
3.2 Proceeds from issue of convertible debt securities	-	-
3.3 Proceeds from exercise of options	-	-
3.4 Transaction costs related to issues of equity securities or convertible debt securities	(162)	(162)
3.5 Proceeds from borrowings	-	-
3.6 Repayment of borrowings	-	-
3.7 Transaction costs related to loans and borrowings	-	-
3.8 Dividends paid	-	-
3.9 Other (provide details if material)	(4)	(4)
<b>3.10 Net cash from / (used in) financing activities</b>	<b>1,305</b>	<b>1,305</b>

<b>4. Net increase / (decrease) in cash and cash equivalents for the period</b>		
4.1 Cash and cash equivalents at beginning of period	1,949	1,949
4.2 Net cash from / (used in) operating activities (item 1.9 above)	(1,049)	(1,049)



<b>Consolidated statement of cash flows</b>		<b>Current quarter \$A'000</b>	<b>Year to date (3 months) \$A'000</b>
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(137)	(137)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	1,305	1,350
4.5	Effect of movement in exchange rates on cash held	-	-
<b>4.6</b>	<b>Cash and cash equivalents at end of period</b>	<b>2,068</b>	<b>2,068</b>

<b>5.</b>	<b>Reconciliation of cash and cash equivalents</b> at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	<b>Current quarter \$A'000</b>	<b>Previous quarter \$A'000</b>
5.1	Bank balances	2,068	1,949
5.2	Call deposits	-	-
5.3	Bank overdrafts	-	-
5.4	Other (provide details)		
<b>5.5</b>	<b>Cash and cash equivalents at end of quarter (should equal item 4.6 above)</b>	<b>2,068</b>	<b>1,949</b>

<b>6.</b>	<b>Payments to related parties of the entity and their associates</b>	<b>Current quarter \$A'000</b>
6.1	Aggregate amount of payments to related parties and their associates included in item 1	82
6.2	Aggregate amount of payments to related parties and their associates included in item 2	-
<i>Note: if any amounts are shown in items 6.1 or 6.2, your quarterly activity report must include a description of, and an explanation for, such payments.</i>		

## Quarterly cash flow report for entities subject to Listing Rule 4.7B

<b>7. Financing facilities</b>	<b>Total facility amount at quarter end \$A'000</b>	<b>Amount drawn at quarter end \$A'000</b>
<i>Note: the term "facility" includes all forms of financing arrangements available to the entity. Add notes as necessary for an understanding of the sources of finance available to the entity.</i>		
7.1 Loan facilities	-	-
7.2 Credit standby arrangements	-	-
7.3 Other (please specify)	-	-
7.4 <b>Total financing facilities</b>	-	-
7.5 <b>Unused financing facilities available at quarter end</b>		-
7.6 Include in the box below a description of each facility above, including the lender, interest rate, maturity date and whether it is secured or unsecured. If any additional financing facilities have been entered into or are proposed to be entered into after quarter end, include a note providing details of those facilities as well.		

<b>8. Estimated cash available for future operating activities</b>	<b>\$A'000</b>
8.1 Net cash from / (used in) operating activities (item 1.9)	(1,049)
8.2 Cash and cash equivalents at quarter end (item 4.6)	2,068
8.3 Unused finance facilities available at quarter end (item 7.5)	-
8.4 Total available funding (item 8.2 + item 8.3)	2,068
8.5 <b>Estimated quarters of funding available (item 8.4 divided by item 8.1)</b>	1.97
<i>Note: if the entity has reported positive net operating cash flows in item 1.9, answer item 8.5 as "N/A". Otherwise, a figure for the estimated quarters of funding available must be included in item 8.5.</i>	
8.6 If item 8.5 is less than 2 quarters, please provide answers to the following questions:	
8.6.1 Does the entity expect that it will continue to have the current level of net operating cash flows for the time being and, if not, why not?	
<p>Answer:</p> <p>The entity does not expect that the current level of net operating cash-outflows to continue. The September quarter included once -off annual administrative expenditure and higher than normal research and development expenditure. Furthermore, the company continues to identify and implement reductions in corporate overhead expenditure, reducing cash outflows.</p>	

- 8.6.2 Has the entity taken any steps, or does it propose to take any steps, to raise further cash to fund its operations and, if so, what are those steps and how likely does it believe that they will be successful?

Answer:

The Company completed a successful capital raise from an entitlement offer to shareholders in the September 2023 quarter and mandated Taylor Collison Ltd to place up to \$3.1m in shares to sophisticated investors. The Company expects that it will continue to receive further support from its shareholders and institutional investors.

The company is in the process of lodging its application for the Research and Development Tax Incentive. This cash in-flow should be received within the next two quarters.

The company also expects to receive additional support from Woodside Energy Technologies and the Australian Government.

- 8.6.3 Does the entity expect to be able to continue its operations and to meet its business objectives and, if so, on what basis?

Answer:

The company expects that it will be able to continue its operations and it is currently on-track to commercialise its products.

*Note: where item 8.5 is less than 2 quarters, all of questions 8.6.1, 8.6.2 and 8.6.3 above must be answered.*

## Compliance statement

- 1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.
- 2 This statement gives a true and fair view of the matters disclosed.

31 October 2023

Date: .....

The Chairman of the Board

Authorised by: .....  
(Name of body or officer authorising release – see note 4)

## Notes

1. This quarterly cash flow report and the accompanying activity report provide a basis for informing the market about the entity's activities for the past quarter, how they have been financed and the effect this has had on its cash position. An entity that wishes to disclose additional information over and above the minimum required under the Listing Rules is encouraged to do so.
2. If this quarterly cash flow report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly cash flow report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standard applies to this report.
3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.
4. If this report has been authorised for release to the market by your board of directors, you can insert here: "By the board". If it has been authorised for release to the market by a committee of your board of directors, you can insert here: "By the [name of board committee – eg Audit and Risk Committee]". If it has been authorised for release to the market by a disclosure committee, you can insert here: "By the Disclosure Committee".

5. If this report has been authorised for release to the market by your board of directors and you wish to hold yourself out as complying with recommendation 4.2 of the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*, the board should have received a declaration from its CEO and CFO that, in their opinion, the financial records of the entity have been properly maintained, that this report complies with the appropriate accounting standards and gives a true and fair view of the cash flows of the entity, and that their opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.