The Chairman and Councillors

Finance and Corporate Committee

NOTICE IS GIVEN that the next meeting of the **Finance and Corporate Committee** will be held in **The Cruise Deck, Club Mount Maunganui Inc, 45 Kawaka Street, Mount Maunganui** on:

EMBARGOED
Until 2 working days before meeting on:

Tuesday, 29 November 2011

commencing at 9.30 a.m.

Mary-Anne Macleod
Chief Executive

22 November 2011

Bay of Plenty
REGIONAL COUNCIL

Finance and Corporate Committee – Terms of Reference

The Finance and Corporate Committee has a core function for formulating finance policy and monitoring financial and corporate performance.

Delegated Function

To develop and monitor Council's financial policy and corporate performance.

Membership

Eleven Councillors including the Chairman as Ex-Officio.

Term of the Committee

For the period of the 2010/2013 Triennium unless discharged earlier by the Regional Council.

Specific Responsibilities and Delegated Authority

The Finance and Corporate Committee is delegated the power of authority to:

Receive the Council's quarterly overall financial reports and to review the appropriateness of reports received and if necessary make recommendations to council on financial matters arising from council's financial reports.

Receive quarterly reports on corporate performance, if required.

Receive and consider month-end financial reports between quarters, if required.

Preview and approve the form and content of the annual financial statements.

Monitor Council's overall service and financial performance against the Ten Year Plan and Annual Plan, including overseeing the production of the Annual Report.

Develop, approve and review council's funding and financial policies.

Review internal financial systems.

Audit financial decisions, if required.

Consider significant corporate matters that require governance input.

Consider applications for the remittance of user fees, charges and rates that can not be dealt with under the delegation of another committee.

Establish subcommittees and delegate to them any authorities that have been delegated by council to the Finance and Corporate Committee and to appoint members (not limited to members of the Finance and Corporate Committee).

Approve its Subcommittee's recommendations for matters outside the Subcommittee delegated authority.

Approve, within its terms of reference, the transfer of budget levels between activities or to exceed the budget level for an activity with no commensurate savings elsewhere, up to $100,000 and to recommend to Council amounts exceeding $100,000.

Note:

The Finance and Corporate Committee reports directly to the Regional Council.

The Finance and Corporate Committee is not delegated the power of authority to:

Develop, approve or review strategic policy and strategy.
Develop, approve or review non financial operational policies and plans.
Allocate funding through the Environmental Enhancement Fund.

Public Forum

1 A period of up to 15 minutes shall be set aside near the beginning of the meeting to enable members of the public to make statements about any matter on the agenda of that meeting which is open to the public, but excluding any matter on which comment could prejudice any specified statutory process the council is required to follow.

2 The time allowed for each speaker will normally be up to 5 minutes but will be up to the discretion of the chair. A maximum of 3 public participants will be allowed per meeting.

3 No statements by public participants to the Council shall be allowed unless a written, electronic or oral application has been received by the Chief Executive (Governance Team) by 12.00 noon of the working day prior to the meeting and the Chair's approval has subsequently been obtained. The application shall include the following:

4 Name of participant;

5 Organisation represented (if any);

6 Meeting at which they wish to participate; and matter on the agenda to be addressed.

7 Members of the meeting may put questions to any public participants, relevant to the matter being raised through the chair. Any questions must be asked and answered within the time period given to a public participant. The chair shall determine the number of questions.

Committee Membership

Chairman: P Thompson

Deputy Chairman: P Sherry

Councillors: I Noble, M Whitaker, J Mansell, R Bennett, J Nees, T Eru, L Thurston, D Owens

Ex Officio: Chairman J Cronin

Secretary: S Cubbon

Recommendations in reports are not to be construed as Council policy until adopted by Council.

Agenda

1 Apologies

2 General Business and Tabled Items

Items not on the agenda for the meeting require a resolution under section 46A of the Local Government Official Information and Meetings Act 1987 stating the reasons why the item was not on the agenda and why it cannot be delayed until a subsequent meeting.

3 Reports

4 Public Excluded Section

Resolution to exclude the public

THAT the public be excluded from the following parts of the proceedings of this meeting.

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution are as follows:

5 Bay of Plenty Regional Council Property Review 29

Reason

That the public conduct of the whole or the relevant part of the proceedings of the meeting would be likely to result in the disclosure of information where the withholding of the information is necessary to enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities.

Grounds

That the public conduct of the whole or the relevant part of the proceedings of the meeting would be likely to result in the disclosure of information for which good reason for withholding would exist.

APPENDIX - BOPRC Land Report

6 Local Government Funding Agency 35

Reason

That the public conduct of the whole or the relevant part of the proceedings of the meeting would be likely to result in the disclosure of information where the withholding of the information is necessary to prevent the disclosure or use of official information for improper gain or improper advantage.

Grounds

That the public conduct of the whole or the relevant part of the proceedings of the meeting would be likely to result in the disclosure of information for which good reason for withholding would exist.

APPENDIX - New Zealand Local Government Debt Report (2011 Q3)

7 Investment Performance Report for the period ending 31 October 2011 41

Reason

That the public conduct of the whole or the relevant part of the proceedings of the meeting would be likely to result in the disclosure of information where the withholding of the information is necessary to prevent the disclosure or use of official information for improper gain or improper advantage.

Grounds

That the public conduct of the whole or the relevant part of the proceedings of the meeting would be likely to result in the disclosure of information for which good reason for withholding would exist.

APPENDIX - 4 October 2011 Report BOPRC

8 Consideration of General Business

Reports

File Reference: 1.00410

Significance of Decision: Receives Only - No Decisions

Report To: Finance and Corporate Committee

Meeting Date: 29 November 2011

Report From: The Chairman

Chairman's Report

Executive Summary

This report provides the Committee with an update on information on Corporate Services activities that are being undertaken, what has been done to date, and what is planned for the future. This follows on from October's report. Committee's feedback on the format and content of this report is, as always, welcomed.

1 Recommendations

That the Finance and Corporate Committee under its delegated authority:

1 Receives the report, Chairperson's Report.

2 Update

The purpose of this report was an endeavour to bring together all organisational efficiency initiatives i.e. those initiatives aimed at reducing cost(s) and enhancing delivery performance, customer service etc.

To date the only initiatives reported have been within the Corporate Service(s)(i.e. support function(s)) area.

The Council needs to consider the development of this initiative and in particular to consider whether it wants to consider a focus on improvement initiatives and how broad such a focus should be.

It is intended to have an informal discussion after the Finance and Corporate Committee meeting on the 29 November to consider some particular changes to the current scope of activities. This report will be considered as part of that discussion.

An update on Corporate Services activities is attached as an appendix for your reference.

Brian Trott
Group Manager Corporate Services

for The Chairman

22 November 2011

APPENDIX

Corporate Services Activities Table

What has been done	What was this	Outcomes	Status	Budget
IM Services Review	Reviewed the information management and IT services offered and bench marked these against other similar councils.	Endorsement of most service levels being offered. Develop a programme for a move to a thin client desktop.	Completed. Action points underway. Key point of improvement is the development of a thin client strategy planned for 3rd and 4th quarter of this calendar year.	The review was $30,240 excluding expenses/ Actual was $30,585 including expenses. The actions have no specific budget as they will be accommodated within current operating budgets.
Data Monitoring Review	Review of how we capture, store and utilize data used in delivering our external functions.	A 5 year development pathway has been established focused on improvements across the board. See paper in today's agenda.	Completed. Action points underway and will help develop next Ten Year Plan.	$10,000 consultancy plus staff time charges to operational expenses.
Laboratory review	Reviewed the need for and operation of an internal laboratory service. Services were benchmarked against other possible options and the market conditions were analysed to identify risks of seeking alternate delivery mechanisms.	Internal service delivery was identified as the best option. Operational improvements were identified. Improved lab performance achieved both financially and in quality assurance.	Completed.	$15,000 approximately including staff time.
Participation in BoPLASS Ltd	This is a long term strategy aimed at obtaining benefits through the aggregation of procurement and service delivery in the back office. There are 9 participating councils.	Improved procurement – insurance, geospatial data, office and stationery equipment, telecommunication services etc. Developing an operating	As part of Councils internal connectivity programme resources are being shared with BoPLASS Council to put in place the connected platform for shared services reliant on IT to begin.	$115,000 in procurement savings for council was reported for the 2009/10 year. This level of savings is predicted to continue through the current year. Intangible returns such as

What has been done	What was this	Outcomes	Status	Budget
		platform for inter council IT services to operate on so that IT dependent shared services can commence.		the benefits of joint procurement of aerial photography.
Corporate Services Strategy	An overall strategy looking at all corporate services, identifying their inter relationships and opportunities for improvements and what will be needed to be done to remove barriers to maximizing these opportunities.	An integrated, planned approach to corporate service offerings. Improved service levels, improved productivity and where achievable additional cost reductions.	To be implemented from the second quarter of the 2011/2012 financial year.	Within allocated resources.
Internal Communications	This plan provides an overview of our current environment, and outlines our goals and objectives, what we will deliver and how we will measure success. It sets out the roles and responsibilities of managers and staff for different teams and levels and discusses key initiatives and projects to manage and develop our internal communications programme.	The goals we want to achieve through our internal communications plan are: • improved knowledge and information flows through effective and efficient use of internal communication tools; • innovative and flexible in our approach to internal communications; • increased support for our internal communications approach and initiatives by all staff; and • know we're succeeding on internal communications.	Several key actions in the plan are being implemented.	Within allocated resources.
Community Relations	This strategy is being	A five-year strategic direction	Signed off by ELT. This will	Within allocated resources.

What has been done	What was this	Outcomes	Status	Budget
Strategy	reviewed and updated to provide guidance on the approach that the organisation will take to Community Relations.	for Community Relations and how the organisation approaches this work and why.	come to Finance and Corporate Committee meeting for information in the New Year.	
Enterprise Architecture Project	This project will identify the current state and desired future state of the Information Management environment. This will include the desktop, network, application and data infrastructure areas. The councils IT environment has grown organically over the years. A more sophisticated, interconnected environment requires a detailed architectural plan.	A detailed architectural plan showing the interdependencies of our physical equipment and the information it carries allowing for more efficient and informed adds, moves and deletions.	Presentation completed at earlier Finance and Corporate Committee meeting. A further presentation will occur when completed at this stage early in the New Year.	$147,000. Includes, staff time, consultancy and software.
Information Strategy Review	This project will review the current Information Management Strategy. This strategy is the key guiding strategy for the Information Management sections of the Technology Group.	A revised 3 year strategy showing current state and desired future state. The implementations of the findings of this strategy are subject to funding resources if required.	Project commences 1 July 2011 and is aligned with the Ten Year Plan process. A presentation was planned later this year but given pressures of the Ten Year Plan and the need for this to link into that, a presentation will be made early in the new year at Finance and Corporate Committee.	$53,000 plus staff time (charged to staff capital).
Property review	A review of all properties	If any parcels of land are	Paper being presented by	Catered for in the overall

What has been done	What was this	Outcomes	Status	Budget
	owned by Council to identify whether they are being used appropriately.	identified as being surplus to requirements, opportunities for divestment will be explored.	Brian Trott at Finance and Corporate meeting scheduled for 29 November.	property management budget.
Project Management	A project to bring project management methodology into the organisation.	Integrated project management across all programmes where required.	Methodology and tool selected, piloting in progress.	$80,000. Expenditure to date is in line with forecast.

File Reference: 1.00424

Significance of Decision: Receives Only - No Decisions

Report To: Finance and Corporate Committee

Meeting Date: 29 November 2011

Report From: Brian Trott, Group Manager Corporate Services

Group Managers' Report

Executive Summary

This report provides Committee members with an update on operational matters of interest not covered elsewhere on the agenda.

1 Recommendations

That the Finance and Corporate Committee under its delegated authority:

1 Receives the report, Group Managers' Report.

2 Audit Review of Information Management Function – for your information

The Office of the Auditor General requires an annual audit of information management systems of local government. Information management systems are integral to most council operations particularly financial record keeping and transactions. These audits are carried out by council's financial auditors, Audit New Zealand. Specialist auditors with an information technology background are used. Issues identified are reported to council management through the "management letter" and if any significant issues are identified these roll up into the audit report that comes to council.

Reports received over the last 10 years that Audit have been doing have been very helpful and have assisted local government across the boards to achieve an appropriate service level across the industry which was one of the initial aims. This has certainly been the experience at the Bay of Plenty Regional Council. Given the function of the audit process the management letters generally commend current practice, identify risks or suggest actions that should be taken. Not all the recommendations or suggestions made by Audit New Zealand are actioned due to the constraining nature that such actions would impose on the efficient operation of the council network or the resources needed to action the recommendations to suggestions. An appropriate balance between risk and user efficiency is applied.

The management letter recommendations for the year ended 30th June covered areas such as generic, network and administration user accounts, remote access to our systems and local administration rights. Appropriate actions have been or are to be taken. Again a balanced approach will be applied.

3 Corporate and Technology Group Service Level Agreements – for your information

As part of the Ten Year Plan and subsequent Annual Plan processes, the Corporate and Technology Service Groups develop service level agreements with the business groups that describe the levels of service they can expect. These agreements are developed with programme and section managers then passed onto the executive team for adoption. These assist the section managers within the Corporate and Technology Service Groups to draft their forecasts for inclusion in the Ten Year Plan. The service level agreements have key performance indicators which are monitored throughout the year and reviewed at year end.

Brian Trott
Group Manager Corporate Services

22 November 2011

File Reference: 1.01718

Significance of Decision: Low

Report To: Finance and Corporate Committee

Meeting Date: 29 November 2011

Report From: Brian Trott, Group Manager Corporate Services

Innovation Fund Projects

Executive Summary

The results of Sam Weiss' 2010 Innovation Fund project 'Nutrient removal from wastewater' are presented. Sam's project is a domestic wastewater treatment system which can be retrofitted to an existing septic tank, at potentially a lower cost to other complying advanced treatment systems, and meets the wastewater quality requirements of the On-Site Effluent Treatment Regional Plan 2006. The system has been tested for a period of 8 months at the independent Rotorua National Testing Programme to verify it meets the permitted water quality requirements. The system is innovative in that it uses existing infrastructure and removes nutrients particularly nitrogen in a simple yet effective way, not used by any existing proprietary domestic scale system.

This report also announces the successful 2011 Bright Idea Innovation Fund projects.

1 Recommendations

That the Finance and Corporate Committee under its delegated authority:

1 Receives the report, Innovation Fund Projects.

2 Approves up to $9,000 funding to enable further development and installation of Sam's retrofit wastewater treatment system to an existing conventional domestic septic tank treatment system within a property in one of the Rotorua Te Arawa lake catchment areas not proposed to be reticulated by Rotorua District Council, provided a significant cost advantage can be demonstrated

3 Confirms that the decision is within the Bay of Plenty Regional Council's strategic planning framework (Council's Ten Year Plan, and planning documents and processes under the Resource Management Act 1991, Biosecurity Act 1993, Land Transport Act 2003, Civil Defence and Emergency Act 2002, and Local Government Act 1974 and 2002).

2 Nutrient removal from wastewater

Sam Weiss was awarded $7,000 as part of the 2010 Bright Idea Innovation Fund round to participate in an 8 month trial of his designed retrofit domestic wastewater treatment system at the Rotorua National OSET Testing Programme. This provides an independent means of assessing if a wastewater treatment system will meet a particular standard of treatment, such as the permitted wastewater quality requirements of the On-Site Effluent Treatment Regional Plan 2006.

Many septic tank systems in the catchments of the Rotorua Te Arawa lakes will become discretionary on the first of December 2012 (as specified in our On-Site Effluent Treatment Regional Plan 2006). Over 1000 property owners will be required to upgrade to advanced on-site wastewater treatment systems which meet the water quality requirements. These systems typically cost between $15,000 and $20,000.

Early indications are that Sam's designed system can be retrofitted to an existing conventional septic tank system at a lower price than other advanced on-site wastewater treatment systems however a cost for a commercialised version of Sam's retrofit system has yet to be established. It is intended that the specifications for the design would be made freely available to wastewater companies and the public.

Nitrogen and phosphorus are key drivers of lake water quality degradation. There is approximately 10kg nitrogen, and 1.5kg phosphorus discharged per household per year from every property with a septic tank. This represents a significant source of the nutrients entering our lakes.

2.1.1 Additional Funding for On-site trial

A possible next phase involves implementing an on-site trial of the retrofit wastewater system. If a significant cost advance over alternative systems can be demonstrated then further funding is sought from Bay of Plenty Regional Council to initiate an on-site trial. A summary project report, prepared by Sam Weiss, is appended to this report.

3 Successful 2011 Bright Idea Innovation Fund Projects

Nine applications were received as part of the 2011 Bright Ideas Innovation Fund project funding round. Four of these projects have been awarded funding to proceed as outlined below. Interviews are scheduled for 8 December with the funding recipients.

3.1 Shane Iremonger's H_2S Odour Threshold Investigation ($5,000)

This project aims to establish an odour threshold for hydrogen sulphide (H_2S) in air. H_2S is responsible for the characteristic 'rotten eggs' odour that most people would associate with geothermal areas. The odour can be detected at very low concentrations in air, and the level at which this first occurs is referred to as the odour threshold. This threshold varies from one person to the next, depending on individual sensitivities, age, state of health, and the conditions under which the odour is assessed.

3.1.1 The issue

No work of this nature has been undertaken within New Zealand, even though in some areas H_2S is a prominent part of the natural environment, whether it be from geothermal features in or around Taupo, Rotorua and Kawerau, or decomposing sea lettuce around Tauranga Harbour.

National guidance documents have relied solely on international work when using the threshold values, and no locally-relevant thresholds have been formally determined. The need for local input is especially important for those areas that already experience a significant background H_2S signature.

The published values for the odour threshold of hydrogen sulphide vary across a wide range of concentrations, as illustrated by the following examples:

- Ministry for the Environment (2002)[1]: 0.2 to 2 µg/m^3
- UK Health & Safety Commission (2000)[2]: 180 µg/m^3
- UK Environment Agency (2002)[3]: 0.76 µg/m^3
- World Health Organisation (2003)[4]: 11 µg/m^3

Several preliminary tests that Shane has undertaken with the Bay of Plenty Regional Council's dilution calibrator (using H_2S reference gas) and a zero air generator, used for calibrating our ambient air quality monitors, has shown that concentrations of H_2S of around 40 µg/m^3 have not been detected by a range of council staff. This very tentative value falls within the ranges listed above, but it needs to be refined in order to be useful for assessing odour impacts on local and adjacent communities when applications are presented to council. This proposal looks at refining the H_2S odour threshold value by using olfactometry equipment and a sample panel of 60 staff members.

The odour threshold for H_2S is used in determining the potential for odour nuisance to arise as a result of discharges to air. This is a key factor in assessing the air emissions from geothermal developments, for which there appears to be a growing demand within the Bay of Plenty region. The threshold value will also be relevant to the assessments for other potential sources, such as waste water treatment plants, waster transfer stations, composting operations.

3.1.2 **The proposal**

Arrangements for the installation of the olfactometry unit (supplied by a third party) will be the first step. Tentative discussions have already been had with several potential suppliers both within New Zealand and Australia.

The organisation of the test panel (60 people) will be the major challenge, ensuring that they are available for the two week period when the unit is setup will be crucial to the success of this project.

Odour threshold measurements will be undertaken over a period of two weeks using an olfactometry unit set up in several rooms in the West Wing of the Whakatāne offices. A total sample size of 60 people is proposed, mainly drawn from regional council staff, with a subgroup of people from the Rotorua office. The latter will be of particular interest as they represent a group of people that are regularly exposed to elevated concentrations of ambient H2S. It is believed that this leads to a greater degree of tolerance of H_2S odours, but it is not known whether this is due to a reduced sensitivity to the odour (ie. a higher odour threshold).

[1] MfE, 2002. Ambient Air Quality Guidelines; 2002 Update. Ministry for the Environment, Wellington. Air Quality Report No 32.
[2] HSC, 2000. Control of Substances Hazardous to Health Regulations, 1999: Proposals for Maximum Exposure Limits and Occupational Exposure Limits. UK Health & Safety Commission, London.
[3] UKEA, 2002. Integrated Pollution Prevention and Control (IPPC): Horizontal Guidance for Odour; Part 1 – Regulation and Permitting. UK Environment Agency, Almondsbury, Bristol.
[4] WHO, 2000. Air Quality Guidelines for Europe. Second Edition. World Health Organisation, Geneva. WHO Regional Publications, European Series, No. 91.

The olfactometry results will be analysed using a statistical approach to determine the odour threshold for both populations, and the significance, if any, of any differences between the two groups.

Production of a report and associated scientific paper would be achievable by the end of 2011/ early 2012.

3.1.3 How it will work

The development of an odour threshold using local residents will help to ensure that the scientific and planning decisions around H_2S discharges are soundly based and directly relevant to the region. A key benefit will be the increased certainty around decision making involving assessments of H_2S odour. There may also be benefits to developers, because the current approach, based on published data, appears to be quite conservative, in that it is assumed that people are more sensitive to H_2S odour than suggested by actual experience.

3.2 Ellis Miller 'Kinecting to presentations' ($250)

Ellis proposes creating a software application that allows the use of Xbox Kinect to control the files (e.g. Power Point presentations, movies, documents etc) needed for use in a presentation. The Kinect sensors can track movements and depth (distance from the camera) and has voice recognition. There will be a presentation controller where you drag the contents of your presentation to, and from there control those items from the presentation screen.

The project involves using the Kinect unit as a natural user interface which is a starting point for future innovation. The project will be documented so that even if the project is a failure, we will still have built up a knowledge base about Kinect, its use, challenges and limitations.

3.2.1 The issue

The issue addressed with this project is interfacing with software, using a natural interface controlling software with movements or voice. The difference that I intend the software to make is providing a seamless transition between documents and programs in a presentation and not needing a device to control the power point slides. The real benefit from this innovation, as mentioned previously, is the research into using the Kinect unit as a natural user interface which is a starting point for future innovation.

3.2.2 The proposal

In practise users would load their presentation documents into the software then won't need to touch the computer again, using the Kinect unit to control the presentation documents. The project will be managed in personal time primarily with some advice sought from my peers along the way. The project has a one year timeframe (i.e. November 2012).

Project milestones

1. Interacting with Kinect – Connecting software to Kinect

2. Create an application that uses Kinect to interact with the user interface (do stuff in the app with Kinect).

3. Draft application design – A design based on the outcomes of 2

4. Initial Application Prototype – This prototype will enable determination of the viability and practicality of the interface

5. Final application design – A design based on the outcomes of 4

6. Deliver application – November 2012

3.3 Glenys Kroon 'Wat-a-game' ($3,000)

Glenys proposes adapting 'Wat –a- Game', a South African developed role playing game that gives a simple but realistic view of the consequences of individual and collective choices for water allocation in a defined catchment area.

Wat-a-game represents a water catchment including different land plots (which the player owns), streams and aquifers that are managed by individual players. The player decides how to exploit their land, the water they need and other resources. They can be confronted with new policies which they must respond to. They have to maintain their land activity and generate enough money to support their family.

3.3.1 The Issue:

Water allocation is a significant regional council responsibility and water is a key economic resources regionally. As some of our water resources come under pressure from competing uses we need to find better ways of allocating the resource, of understanding the impact of our policies and encouraging co-operation between water users. The game may help

- Policy and decision makers to model the consequences of their decisions
- Water users to work more co-operatively especially in water user groups that we seek to set up
- As an exercise for water users groups and policy people to explore different options for water management
- For a fun activity in a boring Council or community workshop
- Educational activity for students to learn about water allocation and trade offs
- Improved community understanding = improved acceptance of policies.

3.3.2 The proposal:

The project involves adapting the game to suite the Bay of Plenty situation by contacting the game developers and gathering simple equipment and data from a catchment (or simply invent a scenario) and determining what water allocation policies will be applied. Then it is a matter of using the game in the following potential situations:

1. Get small team of 3 or 4 people to give it a go

2. Trial game at proposed internal staff water symposium Feb/March 2012

3. Further trial game via Environmental Education

4. Use game in community when setting up water user groups or consulting on water allocation plan change.

The game can be used to model various water allocation policies to aid identifying best policies for water allocation plan changes necessary to give effect to the second generation RPS.

3.3.3 **How it will work:**

Wat-a-game's main features are:

- Able to represent the actual resources of a catchment
- Playable by 1 – 15 participants
- Easy and cheap to set up with everyday materials (pen, paper, sticky tape and glass marbles for water)
- Game lasts 2 -3 hours, but project would look to minimising this time
- Produces actual results – players can see the consequences of their decision making
- Can use real data or simple scenario
- Fun activity for all ages
- Can test and compare different policies.

Wat-a-game is a simple modelling tool able to be used by relevant stakeholders involving potentially real life choices in realistic scenarios. It is low cost, interactive (bringing people together) in a range of situations. The game has potential for genuine learning as well as improved understanding of diverse views. It is intended to be used at the Council symposium February/March 2012 and for modelling policy decisions and for community consultation from March 2012 onwards.

3.4 Arthur Dominick 'Carbon Credit Scheme' ($5,000)

Any regional council staff member who walks/runs/cycles to work collects 1 Carbon Credit per km travelled. These carbon credits will be entered by staff and tracked in a simple intranet service (e.g. like that used by Bike Wise website tracking function). The carbon credits can be cashed in on an annual basis for a collection of native plants and staff will then spend a day planting at a selected site(s) with relevant staff involved.

3.4.1 **The issue:**

The scheme creates incentive for staff to become more environmentally friendly with the purpose of contributing to New Zealand's indigenous flora. Staff members are directly involved with assisting the environment and receive the feel good factor of helping out, which in turn raises staff morale. Bay of Plenty Regional Council also receives positive publicity throughout the community with this endeavour.

3.4.2 **The proposal:**

Development of the intranet service, Purchase of plants, Scheduling of planting, administration of reporting, promotion of the service. Not sure how this can be made secure, in the sense that staff will not take advantage. Maybe journey distance from home to work will be noted by administrator e.g. 4.3km x 5days = 21.5 carbon credits (Unsure as to the exchange rate for carbon credits to cash – could it be a direct relationship, 1 carbon credit = $1)

This will become an intranet service that staff are automatically signed up for but would have to manually enter their own km's per day/week. If cost is a worry then the value earned per week per staff member could be capped.

Once yearly a report is generated from the Intranet Service listing staff members who have completed km's and are invited to plant on a specific day.

3.4.3 **How it will work**

Application Development Services assistance will be acquired to develop an online Carbon Credit Service (available on the intranet). Communications staff assistance will be necessary to promote this initiative internally to staff. Once yearly a report is generated from the Intranet Service listing staff members who have completed km's and are invited to plant on a specific day. There will be an element of reliance upon staff keeping honest records of distances travelled.

4 Financial Implications

Current Budget

There are no financial implications on the current budget as a result of this report.

Future Implications

Any future request for additional funding for the on-site trial, pending confirmation of a significant cost advantage, would be a one off for this project. There may also be future requests for additional support for other successful Innovation Fund projects.

Nassah Steed
Senior Planner

for Group Manager Corporate Services

21 November 2011

APPENDIX

Report on the OSET AWTS-N1 wastewater treatment system

Prepared by: Sam Weiss **Date:** 16 November 2011

File Ref: A995929

Subject: **Report on the performance of the AWTS-N1 wastewater system**

Purpose

This report details the results of a trial of a domestic scale wastewater treatment system (AWTS-N1) developed by staff, and partly funded by the Bay of Plenty Regional Council Innovation Fund. It describes how the system works, why it might be useful, and the standard to which it treats wastewater.

Summary of Findings

The AWTS-N1 treatment system meets the wastewater standard required by the On-Site Effluent Treatment Regional Plan 2006 for installation into Rotorua. This has yet to be confirmed by the independent external group who will formally report on its performance. The meeting to discuss the performance of the systems which took part in the 2010 – 2011 trial (including the AWTS-N1) is to be held on 30 November 2011 in Rotorua.

The unconfirmed results of the Regional Council AWTS-N1 system, compared to the OSET Plan limits, for the benchmarking period are shown below:

	OSET Plan limit for Rotorua (gms/1000 l)	Average (gms / 1000 l)	Maximum (gms / 1000 l)
Total Nitrogen	**15**	**6.2**	**11.7**
BOD	**30**	**4.4**	**8.0**
Suspended solids	**45**	**4.5**	**8.0**

The costs for such as system, if it was to be produced commercially have not yet been determined. If it can be produced at a significant price advantage over other approved commercial wastewater treatment systems then the Regional Council may then work with a manufacturer to construct a commercial prototype and carry out a field trial.

Introduction

In December 2011 many septic tank systems in the Rotorua area become discretionary. Many properties will be able to connect to a sewerage reticulation system however a significant number will not. Those that cannot will be required to upgrade to an advanced system or obtain resource consent involving some type of nutrient mitigation or a system upgrade.

Because many of the properties requiring upgrade possess a septic tank in good condition, staff considered that a more cost effective way of meeting the required standard would be to utilise the existing infrastructure. Following encouragement from Eddie Grogan, our Group Manager, various experiments to remove nitrogen were carried out at the Rotorua Waste Water treatment plant. An early attempt at using zeolite to adsorb ammonium appeared initially to be successful however its effectiveness dropped over sharply after the available adsorption sites were used up.

In 2010 a prototype wastewater system was designed by staff. This was entered into the On-Site Effluent Treatment (OSET) National Testing Programme (NTP) formal Rotorua trial (number 6) which ran from November 2010 through to July 2011. The results of this trial are presented here.

Regional Plan Requirements

A future OSET Plan change may alter requirements but for now rule 2(g) of the OSET Plan states that all conventional on-site effluent systems, on properties less than 2 hectares, anywhere within the catchment of Lakes Rotorua, Rotoiti, Ōkaro and Ōkāreka must reduce the nitrogen levels in the wastewater discharge to 15 g/m^3. The same requirement applies to systems within 200m of any of the other Rotorua lakes.

The water quality limit that applies per 1000 litres (= 1 m^3) of wastewater (refer rule 11) is:

Total Nitrogen (Tot-N) ……	15 grams
Biochemical oxygen demand (BOD)……	30 grams
Total suspended solids (TSS)……	45 grams

Trial facility - On-Site Effluent Treatment (OSET) National Testing Programme (NTP)

The original trial facility was established in 2005 by the Bay of Plenty Regional Council in conjunction with Environment Waikato and Rotorua District Council. Since then it has gone through several iterations and been completely rebuilt to accommodate the high degree of consistency and reliability demanded by industry. The current OSET NTP was established in 2008 under a Memorandum of Understanding (MOU) between Bay of Plenty Regional Council (BOPRC), Rotorua District Council (RDC), Water NZ, and SWANS-SIG (Water NZ Small Wastewater and Natural Systems Special Interest Group), following three years of trials which were run by the Bay of Plenty Regional Council.

It provides a testing and benchmarking facility for on-site domestic wastewater treatment units. There is a Management and Auditing Group (MAG) made up of representatives of SWANS-SIG, Bay of Plenty Regional Council (Sam Weiss), Rotorua District Council plus two independent wastewater specialists, and is administered by the NTP Technical Manager. The benchmarking and audit reports are provided to the individual manufacturers, the MOU Partners, and those Regional and District Councils providing financial grants as Funding Partners to the NTP.

The OSET National Testing Programme is based on testing systems in an environment replicating a typical domestic situation. 1000 litres is used as it approximates the volume of wastewater produced by a dwelling with five to six residents.

The trial has several distinct phases. The first of these is the 'media development' which allows the various biological processes to become well established. The second is 'pre-bench marking' where sampling is carried out but not used for formal evaluation. The third is bench marking where the sampling results are used for evaluation. The fourth and last is the 'high load' phase. Here wastewater is delivered at twice the daily volume i.e. increased to 2000 litres per day. This tests the ability of a system to deal with high load stress conditions, such as experienced in a holiday home scenario over summer.

Wastewater is sampled before it enters the treatment system, and also then at the end of the treatment process for each different system. Further treatment is generally obtained from the ground disposal however no allowance is made for that here or in the plan requirements, based on the fact that at times the soil adds very little further treatment.

Figure 1: Overview of OSET Test Facility, Rotorua

Figure 2: Header tanks delivering wastewater

AWTS-N1: How the Nitrogen removal treatment system works

Following primary treatment in a septic tank the wastewater enters an aeration phase (figure 3). Here almost all of the ammonium is converted into the nitrate (NO_3) form of nitrogen (nitrification). The next step involves clarification (figure 4), settling and the return of settled sludge back to the primary tank. The final stage of treatment involves passing the wastewater through a saturated bark media (figure 5). Bacteria here are largely starved of free oxygen so strip the oxygen from the nitrate, leaving the nitrogen gas to discharge to atmosphere (denitrification). Wastewater then flows into a pump chamber (figure 6) from where it is pumped out.

Phosphate reduction

Following a literature review staff determined that the only feasible means of removing phosphate from the waste stream was to dose it with a compound such as aluminium sulphate (alum). Based on the amount of phosphate present, only about 1.5 drops per minute of aluminium sulphate is

required. Various options were explored for delivering such a small volume. Suitable dosing pumps are prohibitively expensive so were ruled out. A medical supplies company was then visited and a hospital drip obtained. This can successfully deliver the required rate however it was found that it does not do so consistently over time, or under variable static head (pressure) conditions. Staff concluded that further phosphate reduction is not practical, beyond what the standard AWTS treatment system delivers of about 55% (6.7 grams per 1000 litres in raw wastewater compared to 3.0 grams in final effluent). This is comparable with other treatment systems.

Figure 3: AWTS-N1 Treatment Tanks

Figure 4: AWTS- N1 Inside view of treatment tank

Figure 5: Bark Flume for Denitrification

Figure 6: Pump chamber at the end of Bark Flume

System Performance

The AWTS-N1 easily meets the standard required by the Bay of Plenty Regional Council OSET Plan for wastewater disposal in the Rotorua region. Graphs showing the performance of the system for a range of parameters, including nitrogen, suspended solids, BOD and phosphorus are presented at the end of this report. A number of interesting observations can be made from these graphs, including the sensitivity of some of the biological processes to high load and / or cold temperatures, as is typical of all advanced treatment systems to some extent. Abbreviations used in these graphs not previously referred to include T.P. (total phosphorus) and F.C. (faecal coliform).

System Costs

As with any on-site wastewater system costs stem from both the capital and the operational components. The capital costs for the AWTS-N1, were it to be produced commercially, have not yet been determined but may be lower than advanced system alternatives. Over the last few years the cost for systems meeting the permitted criteria for Rotorua has dropped from about $25,000 to now $15,000 or even less.

The operational costs is formed mainly from electricity, system servicing and bark replacement. The AWTS-N1 requires electricity for two components which are not part of a standard septic tank system. The first is an aeration unit, while the second is to pump the wastewater to a subsurface irrigation field. The amount of electricity used by the system is about 2.6 kWh per day. This equates to a figure approaching $300 per annum. Maintenance / servicing costs of advanced treatment systems typically is around $200 per annum.

Additional costs with the AWTS-N1 will be the eventual replacement of the bark. While the effective life of the bark is unknown at this time it is estimated that it will last about 5 years and cost $1000 to replace.

Next Steps

1. Work is underway to determine the price of a commercialised version of the AWTS-N1. If price indications are that this system presents a significant cost advantage then the following steps could be undertaken;

2. Refine the system, and work with a manufacturer to develop a commercial prototype;

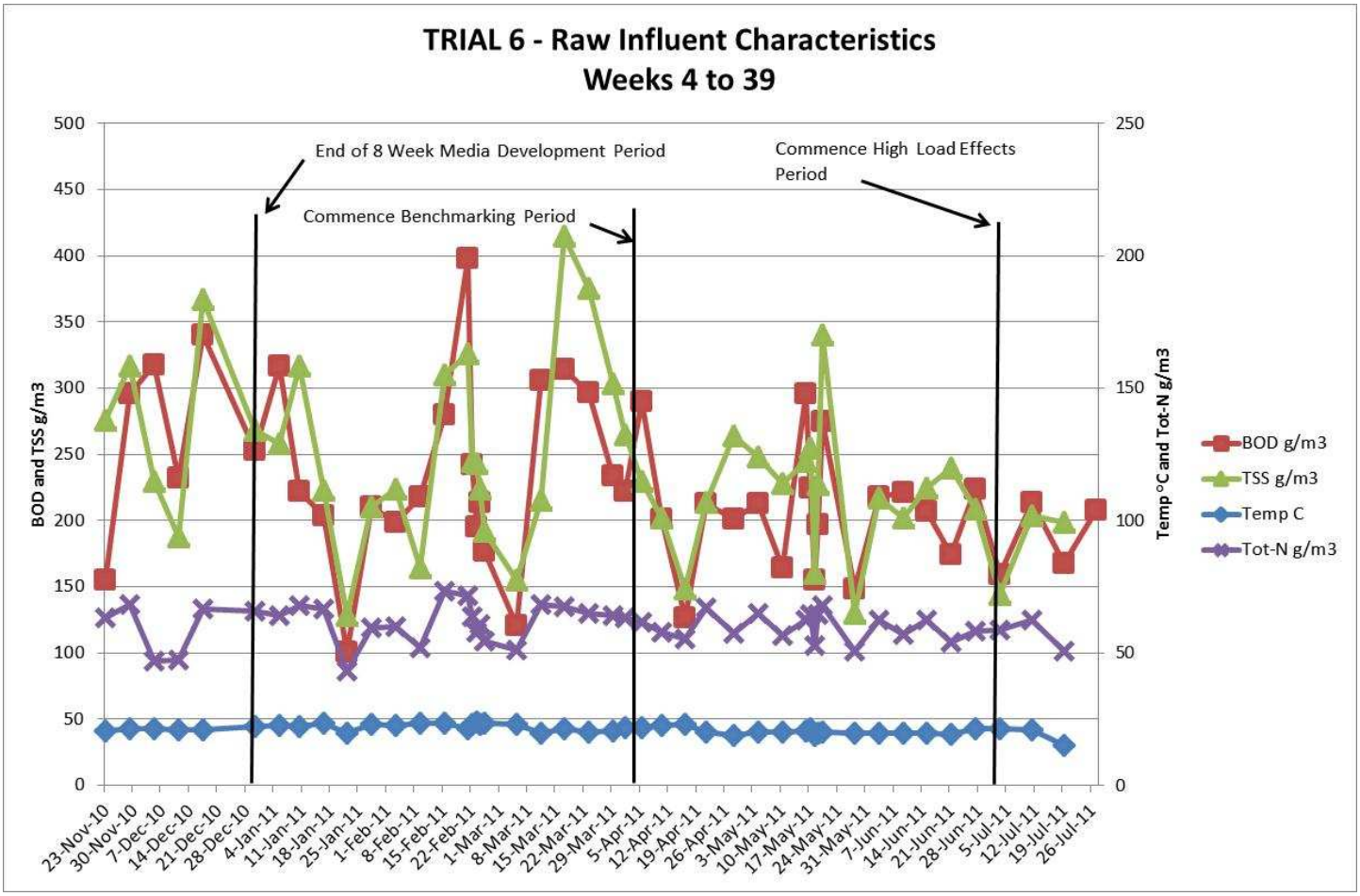
3. Install the system into a ‘real life’ domestic situation to assess its performance. The costs associated with this are:
    a) Materials
    b) Construction
    c) Installation
    d) Sampling / Collection
    e) Laboratory

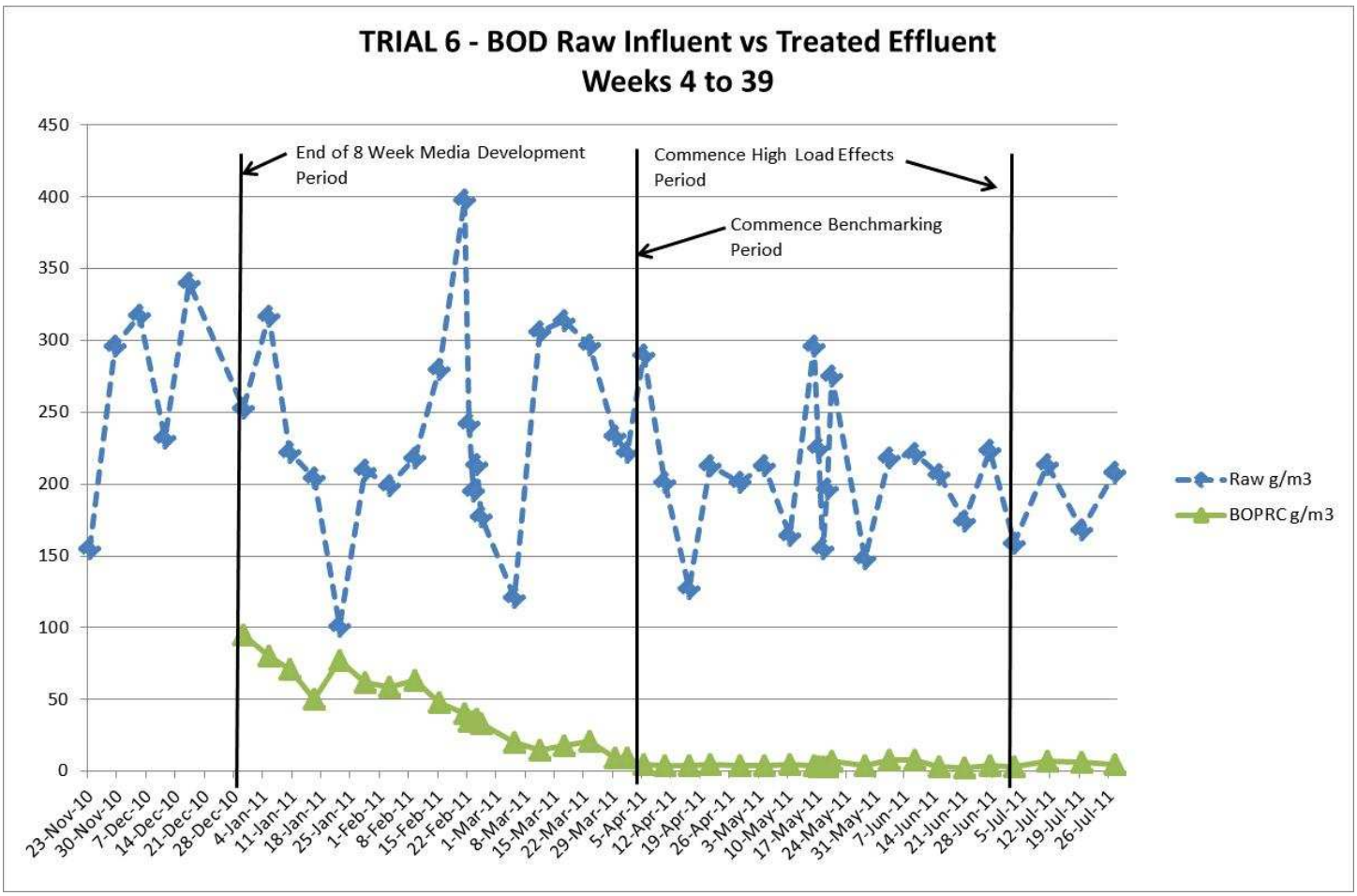
4. If the system demonstrates itself to be practical, robust and effective then detailed plans for construction can be made widely available, presenting the public with another option for complying with the OSET Plan requirements

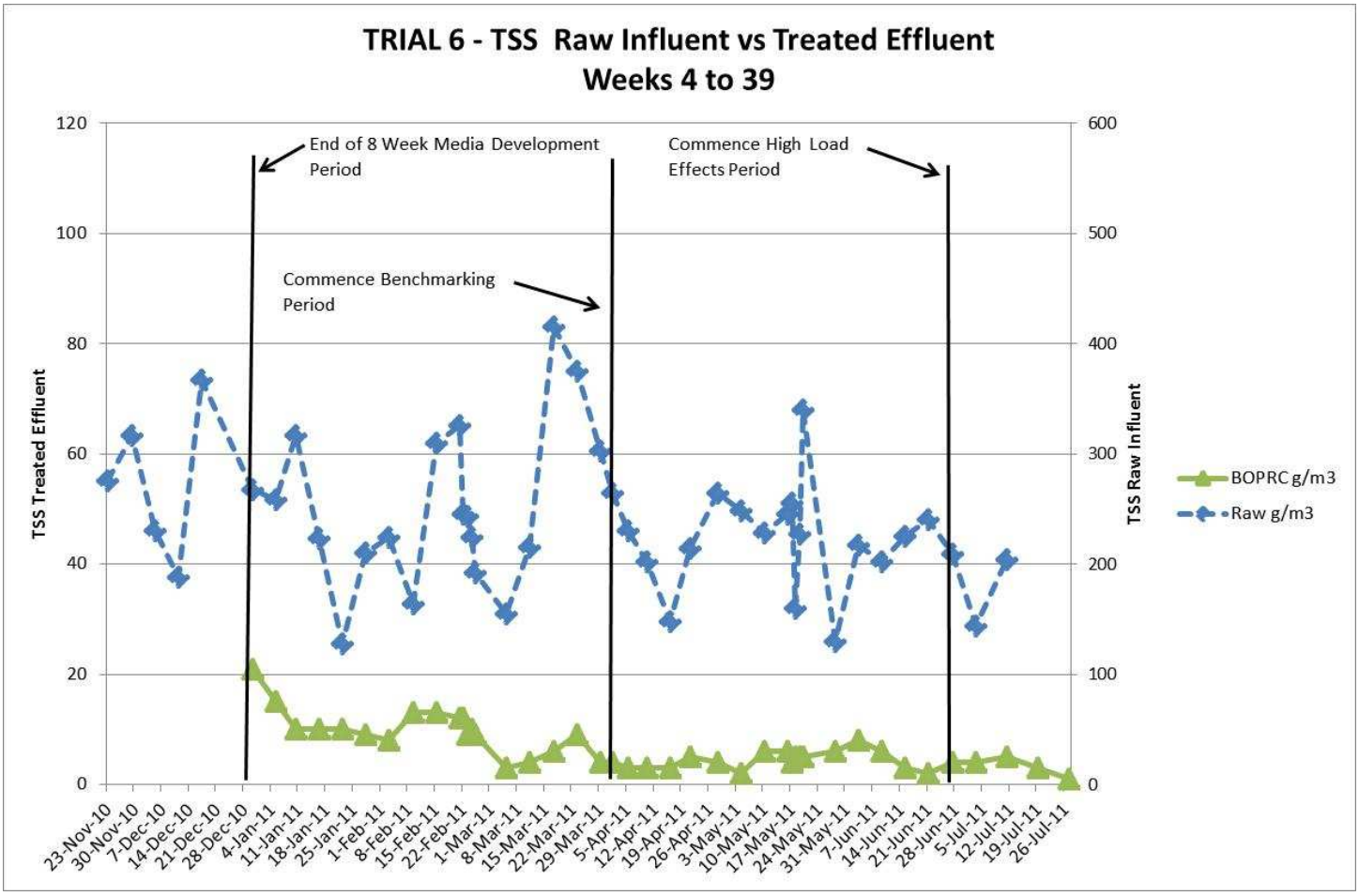
Acknowlegements

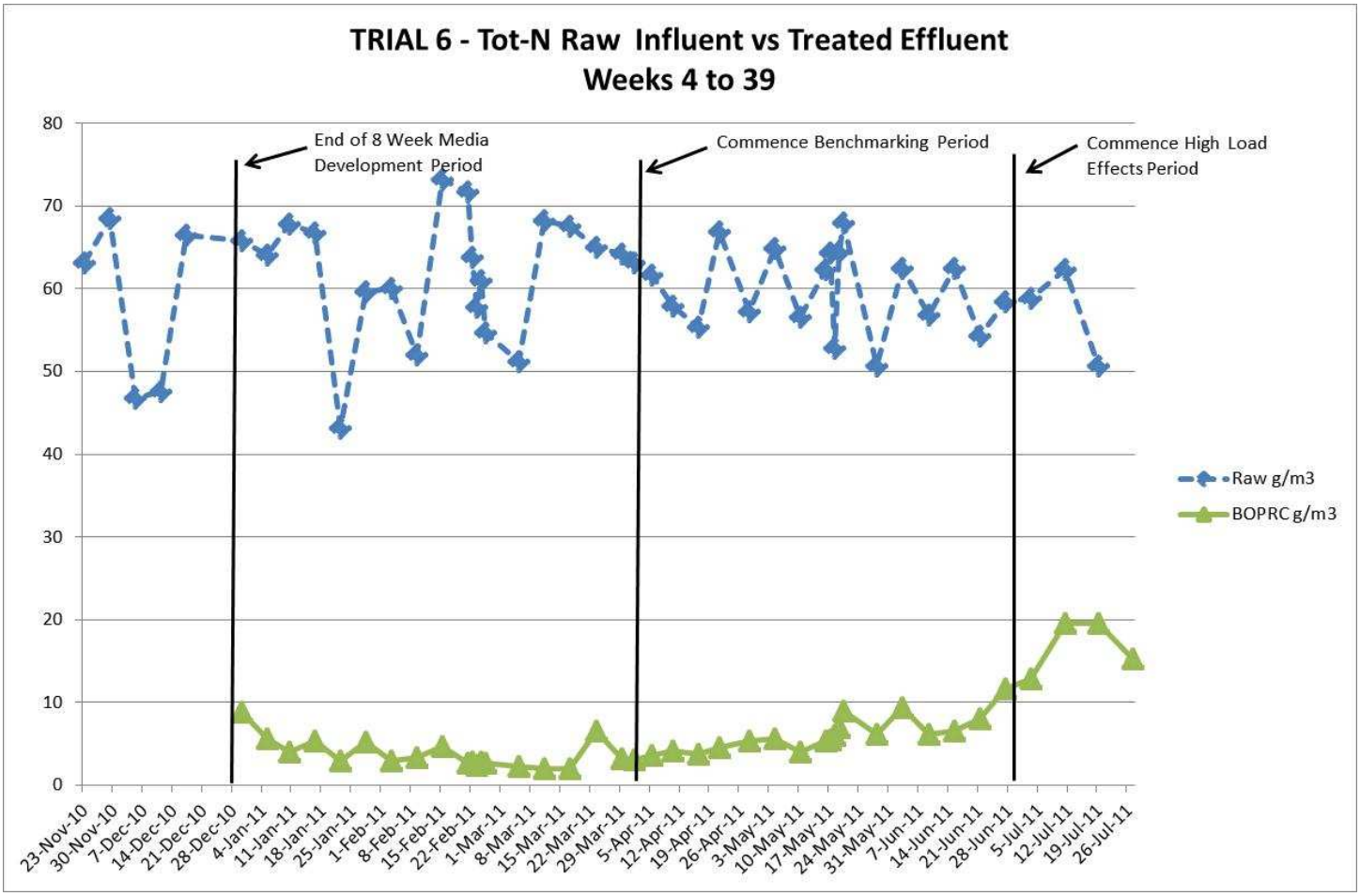
- Staff gratefully acknowledge the financial support from the Regional Council Innovation Fund.
- Thanks to Devan Tanks who assembled the treatment system and provided parts at a large discount.
- Ian Gunn, Technical Manager of the OSET National Testing Programme, is acknowledged for preparation of the graphs contained in this report. Any errors contained in this report or deficiencies of the treatment system remain those of the author.

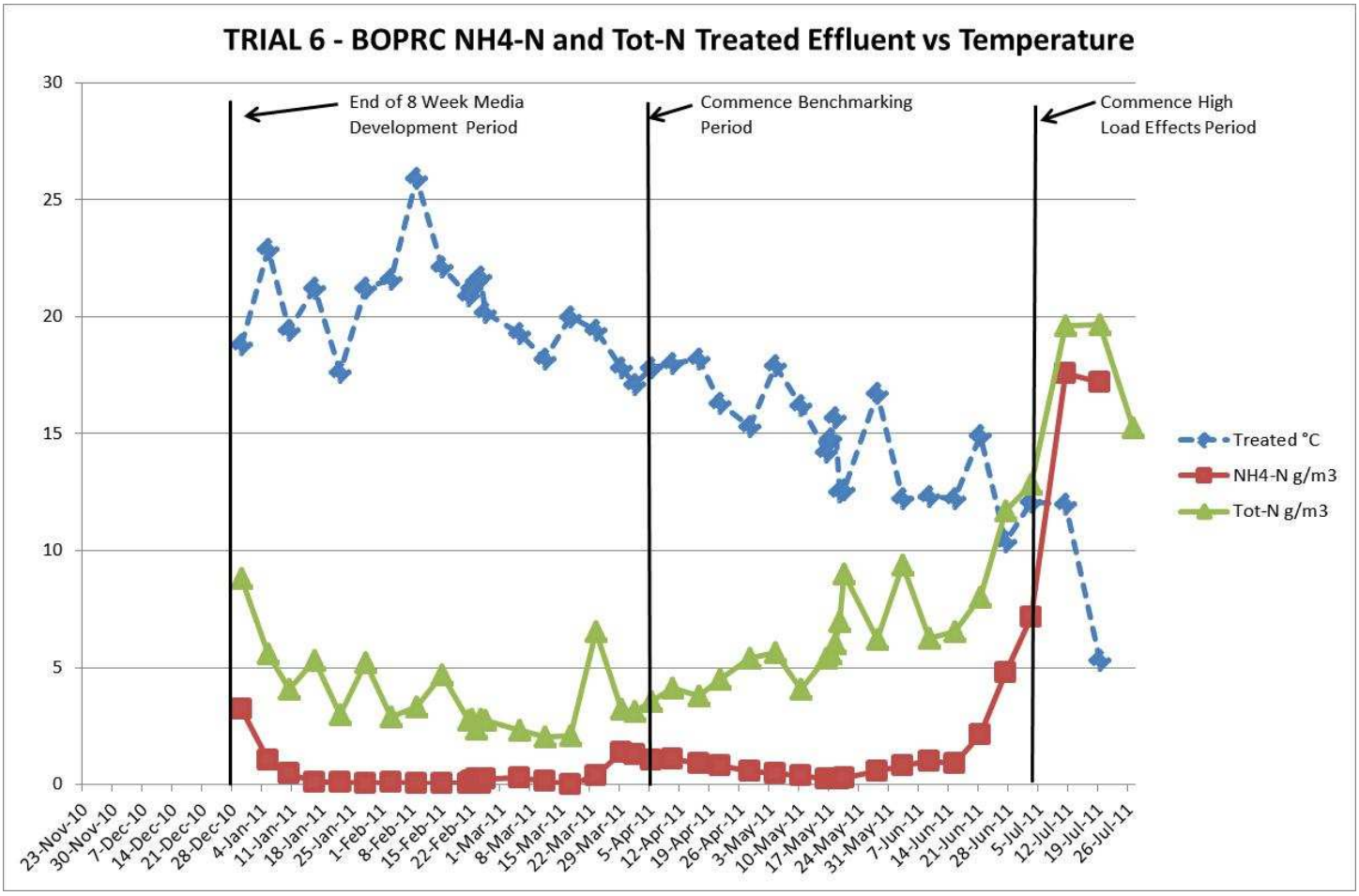
Appendix – Graphs

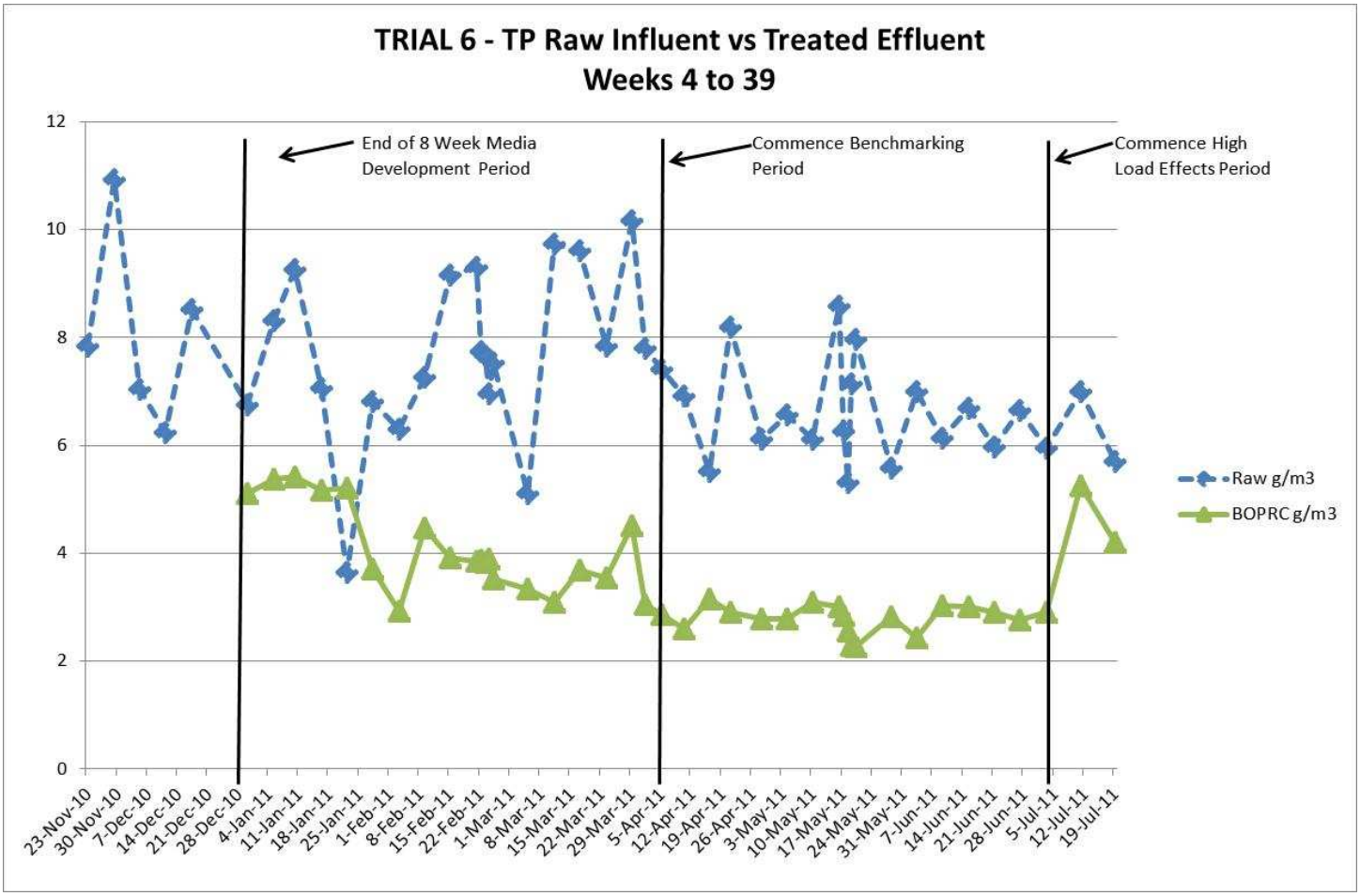


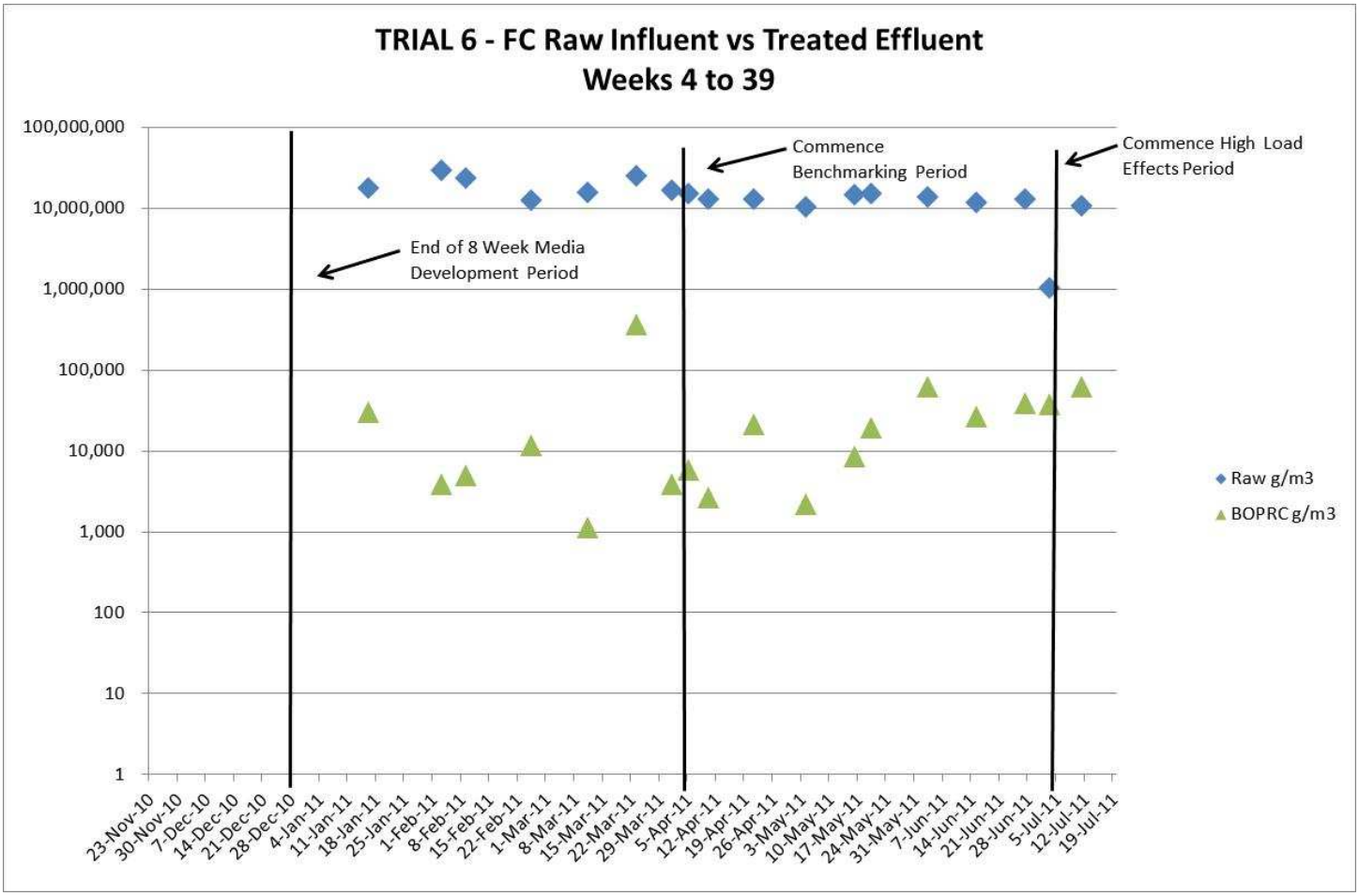



TRIAL 6 - TSS Raw Influent vs Treated Effluent
Weeks 4 to 39
End of 8 Week Media Development Period
Commence High Load Effects Period
Commence Benchmarking Period
TSS Treated Effluent
TSS Raw Influent
BOPRC g/m3
Raw g/m3


TRIAL 6 - Tot-N Raw Influent vs Treated Effluent
Weeks 4 to 39
End of 8 Week Media Development Period
Commence Benchmarking Period
Commence High Load Effects Period
Raw g/m3
BOPRC g/m3


TRIAL 6 - BOPRC NH4-N and Tot-N Treated Effluent vs Temperature
End of 8 Week Media Development Period
Commence Benchmarking Period
Commence High Load Effects Period
Treated °C
NH4-N g/m3
Tot-N g/m3
30
25
20
15
10
5
0
23-Nov-10
30-Nov-10
7-Dec-10
14-Dec-10
21-Dec-10
28-Dec-10
4-Jan-11
11-Jan-11
18-Jan-11
25-Jan-11
1-Feb-11
8-Feb-11
15-Feb-11
22-Feb-11
1-Mar-11
8-Mar-11
15-Mar-11
22-Mar-11
29-Mar-11
5-Apr-11
12-Apr-11
19-Apr-11
26-Apr-11
3-May-11
10-May-11
17-May-11
24-May-11
31-May-11
7-Jun-11
14-Jun-11
21-Jun-11
28-Jun-11
5-Jul-11
12-Jul-11
19-Jul-11
26-Jul-11


TRIAL 6 - TP Raw Influent vs Treated Effluent
Weeks 4 to 39
End of 8 Week Media Development Period
Commence Benchmarking Period
Commence High Load Effects Period
Raw g/m3
BOPRC g/m3
12
10
8
6
4
2
0
23-Nov-10
30-Nov-10
7-Dec-10
14-Dec-10
21-Dec-10
28-Dec-10
4-Jan-11
11-Jan-11
18-Jan-11
25-Jan-11
1-Feb-11
8-Feb-11
15-Feb-11
22-Feb-11
1-Mar-11
8-Mar-11
15-Mar-11
22-Mar-11
29-Mar-11
5-Apr-11
12-Apr-11
19-Apr-11
26-Apr-11
3-May-11
10-May-11
17-May-11
24-May-11
31-May-11
7-Jun-11
14-Jun-11
21-Jun-11
28-Jun-11
5-Jul-11
12-Jul-11
19-Jul-11


TRIAL 6 - FC Raw Influent vs Treated Effluent
Weeks 4 to 39
100,000,000
10,000,000
1,000,000
100,000
10,000
1,000
100
10
1
End of 8 Week Media Development Period
Commence Benchmarking Period
Commence High Load Effects Period
Raw g/m3
BOPRC g/m3
23-Nov-10
30-Nov-10
7-Dec-10
14-Dec-10
21-Dec-10
28-Dec-10
4-Jan-11
11-Jan-11
18-Jan-11
25-Jan-11
1-Feb-11
8-Feb-11
15-Feb-11
22-Feb-11
1-Mar-11
8-Mar-11
15-Mar-11
22-Mar-11
29-Mar-11
5-Apr-11
12-Apr-11
19-Apr-11
26-Apr-11
3-May-11
10-May-11
17-May-11
24-May-11
31-May-11
7-Jun-11
14-Jun-11
21-Jun-11
28-Jun-11
5-Jul-11
12-Jul-11
19-Jul-11

Public Excluded Section