**Add-ons Treatment Technologies to the Treatment Process Options (Updated 22 April 2015)**

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| **Technology/ Provider** | **Description/Notes** | **Expected Performance** | **Issues/Information required** | **Communication** |
| IndigitechContact: Victor MainEight Associates LtdAuckland021 40 1119  | * Indigitech technology is apparently developed, however the core process is kept secret for Intellectual Property protection.
* Technology is a tertiary “polishing system” (final treatment) with a filtration and backwashing type arrangement.
* We have been told that the unit has been tested and that there is a small-scale system operating successful. Apart from the company’s claims, we have no published results or evidence to date on what constituents the units are capable of removing.
* To build a large apparatus to prove scalability and applicability for high volume contaminated water flows. The unit will apparently be completely configurable and capable of replicating high volume flow rates unique to each area.
* Estimated M$5 for a system for RLC -includes installation
 | Claimed removal of (after being asked):* particulates
* 99.9% E coli and other pathogen kill
* dissolved organic nitrogen fractions
* extremely low concentrations of metals
* methyl triclosan, triclosan, bisphenol-A, estrone and 17α-ethynylestradiol.
 | Unknown processes. Evidence of removal of specific constituents from operational-scale application(s) is required. *“The water technology is still a high priority for us and we will be building a system suitable for Councils and others to test as soon as we can… we are looking at early next year [2015] to revisit the waste water filtering project. I have let Wally and Peter know our position as well and will keep them updated”.*  |  |
| Biochar and activated carbon | * Biochar, activated carbon and charcoal are formed from the thermal decomposition of organic material under limited supplies of oxygen (O2) for a period of time, at varying temperatures generally <700°C. The quality, impurities, calorific value, adsorption properties, particle size varies depending on the end use. Charcoal is produced as a fuel, biochar with the intent to be applied to soil as a carbon sink, and a higher quality product (activated carbon) for use in water filtration. Filtration technologies using activated carbon are already on the market and generally used for potable water supplies and aquariums.
* Local investors are considering building an operational plant using one of two technologies. One is operational at the pilot plant level in Taupo albeit with issues that need to be resolved, the other is till at bench-scale. A manufacturing plant is at least 18-months away, and then it is likely to be providing the biochar material which would then need to be considered for incorporation into a filtration treatment.
 | * Performance will depend on the organic material used, the process, the particle size etc and how the material is incorporated into a treatment process. It is generally incorporated into filtration technologies to remove particulates, colour and adsorb ions.
 | Info will be available for available technologies ?Could consider available technologies that incorporate activated carbon media in a way that would allow for the substitution of locally produced media in the future if suitable.  |  |
| Microvi | * MicroNiche technology involves synthetically designing the microenvironment of a biological system to optimize enzymatic processes i.e precisely controlling the treatment process, utilise only the active effective microbes in a focused, structured environment (precisely controlling biological outcomes), ie a type of fixed media
* Developed system that is apparently cost effective and clean solution specific to a particular environment.
 | * A variation on secondary treatment with fixed-media therefore similar performance but in less space
* results in a smaller footprint for biological nutrient removal (the secondary stages) so lower Capex.
* lower operations and maintenance cost compared to traditional wastewater treatment.
 | Information available on effluent quality and characteristics.Treatment system design is specific to the environment. We already have secondary treatment capacity which would cost to redesign and retrofit with possibly minimal gain in performance  |  |
| EverseHone Waudby CEOhone@everse.co.nz021 238 1026[www.everse.co.nz](http://www.everse.co.nz/) | * Involves silica-rich material that absorb nutrients
* Make reagent liquid or powders that
* A combination of natural products rare earth minerals tailoring a product specifically for our
* Put a system in for Aluminium removal in Chile in conjunction with an engineering company.
* In Chile ponds wit 2 days residence time, mixed with power boats, settled and discharged
* Very roughly maybe ½ t per 3-4 million litres
* Set it up 2 filtration systems medium in the mining company: (i) standard wastewater filtration system and (ii) large 40 foot shipping container
* Will adsorb heavy metals in in-active form,

And phosphate in active form * At the moment importing from Australia
* Requirements for 1l
* Take P out of solution
* Very simple
* 120 different reagents
 | Currently taking treated wastewater from Rotorua and testing | Awaiting results4 samplesP=0.14; 0.10; 0.05; 0.027He will send powerpoint |  |
| Liquid Media Operations (Advanced Purification Systems)Contacts: Graham Caird CEO of Advanced Purification Systems graham.caird@gmail.com  027 433 8698Jodie Harvey liquidmediaoperations@gmail.com | * Patent registered with IPONZ and includes processes that cover treating of industrial wastes, human wastes, dairy effluents, marine water wastes and others.
* It appears to be another variation of a black box that incorporates natural media that retains particulates, adsorb ions, and some process for killing pathogens with no addition of chemicals (same as Indigitech).
 | * Claims on performance were in a confidential email.
 | A plant in Southland is still in the testing stage (possible contact for more info is Terry Nicholas of Ngai Tahu 021 989 845 (terry.nicholas@hokonuirunanga.org.nz)Firstly they want a confidentiality agreement. Then ask if we would consider sending 20000 L in a tanker to Southland for independent testing, or have some of their equipment located at the WWTP for a few months to  |  |
| The company Water Liberty markets the product ‘Adya Clarity’ | * A water purification product
* Incorporates (or is?) black mica, biotite, an iron-rich phyllosilicate mineral, ie contains aluminium- and iron-based salts
* biotite is used in complementary/ alternative medicine
 | Naturally occurring alum- and iron-based coagulant/flocculantClaims:* Purifies drinking water naturally, restores its natural healing properties
* Removes fluoride, heavy metals, harsh chemicals, insidious bacteria, and other pollutants …
* Converts your tap water (and even your bottled water, which is “dead” water) into the *best water on this planet* by infusing it with life-giving and health-promoting minerals…
* And is even clinically tested and proven to remove accumulated carcinogenic heavy metals and toxins from your body *by as much as 40%* — cancer-causing contaminants such as mercury, lead, arsenic, aluminum, and more!
 | Product price and specs as an alternative coagulant/flocculant?Would then require testing and/or feasibility study |  |
| Water Clean technologiesTERRY WEARMOUTHTECHNICAL DEVELOPMENT MANAGERT +64 (0)9 973 3443  |  M  +64 (0)21 240 6179 | * Floating wetland media in one of the existing ponds onsite at the WWTP
* An option to provide for cultural requirements prior to discharge
* Indicative cost $500k
 | Not designed for further nutrient removal  | Proposal will follow |  |

Prepared by: AP and AL