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| In the Matter of | Rangitikei District Council Proposed District Plan Change Rezoning of 1165/1151 and 1091, SH 1, Marton |
| Under | The Resource Management Act |
| Submitter | Howard and Samantha Walsh |

# Brief of Evidence of Paul William Wright

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## Brief of Evidence – Paul William Wright;

**In the Matter of** Proposed Rangitikei District Plan Change (Marton) Friday, 20 March 2020

I, **Paul William Wright**, state:

**Qualifications as an expert and area of expertise:**

1. I am a farm drainage contractor and Director of PW Wright Contracting Limited. PW Wright Contracting Limited installs and maintains tile drains primarily on farmland in the Marton/Wanganui/Rangitikei District. I have laid tiles on the Walsh's property on SH 1.

2. I have been working as a drainage contractor for over 30 years. I say over 30 years because the business was originally my father's and I helped him from a very young age, including in the late 1980s and early 1990s when I was still at school so in effect it has been longer.

3. This area has no formal qualifications. As a result of my father's enthusiasm however and being in the industry, in the late 80s and into the early 90s, my father used to take me to land drainage seminars which were run by the Massey University Department of Soil Science (and then subsequent to that by MAF).

4. When I was learning my father's business I also read books and papers that were put out by the University at the time for the industry however this type of industry support is no longer generally available in New Zealand. It was useful in learning my trade and we took the information we were given seriously. Modern practitioners often now use mdpe plastic pipe which is not as effective. We use tiles in 85% of our work.

5. I have worked for decades in the same area and been able to observe the effect of my work on properties over extended periods and over extreme as well as standard weather events. I have also been called on from time to time to repair tile drains.

6. I consider myself to be an expert in the area of drainage tiles generally, and those in Marton soils in particular, because of my early training and ongoing work with tile drainage systems in the Marton District, including on the Walsh's farm. I do not purport to be an expert on waste water systems in general or a drainage engineer.

**Code of Conduct:**

7. I confirm that I have read the Code of Conduct set out in the Environment Court practice notes 2014 and agree to comply with it.

8. I understand that in giving evidence on the tile system, I have an overriding duty to the Court to be impartial in relation to my expertise and not behave as an advocate.

9. I do not have an interest in the proceedings.

**How a Tile Drainage System Works:**

10. Field drainage is installed to rapidly remove excess soil water and to reduce or eliminate waterlogging. Drains can be used to control a water table or to remove excess water held in the upper horizons of the soil. A good drainage system will reduce the risk of waterlogging to acceptable levels. This is particularly so in clay soils which without drainage can stay waterlogged for long periods. The Walsh's soils where I have worked are clay.

11. Good field drainage reduces the peak surface water run-off rates by increasing the availability of storm-water storage within the soil. Rainfall then percolates down through the soil into the drains, producing a more balanced flow after storms. This reduces the risk of flooding and soil erosion.

12. Under the ground in large areas of farmland in New Zealand, there are extensive drainage tile systems. Some of these can be up to 100 years old and still function perfectly. They are expensive to install but the effects on the productivity of the land from that point are enormous.

13. Not all tile drains are mapped. I have seen farmer's notebooks and private maps identifying where the tiles go that go back many decades. We now identify where new tile lines are by GPS but this is relatively recent technology. Not all the current tile lines have been identified by GPS. This is usual and ordinarily the people who know where the tiles go are the farming family.

14. Drainage tiles are pipes made from semi-porous clay that are laid in a trench, including where a natural watercourse would ordinarily run.

15. The tile lines can be anywhere from 20 meters apart to 80 meters apart. It depends on the lay of the land and where the natural watercourse would ordinarily have been. There should be a tile line up each watercourse. The Walsh's land is on the upward side of the tile system and the land proposed for development is on the receiving end.

16. The method of laying tiles is that a trench is dug by a trencher through the top soil and down into the clay bed –anywhere from 80cms deep. Then the tiles are laid in the bottom of the trench.

17. When these tiles are in place, we then attach a mole plough to the back of the tractor and run it under the ground in long lengths roughly 2m apart. This is ploughed around 50cm deep, down into the clay, and just above the tiles. These moles run into the tiles.

18. These moles allow surface water to drain down into the ground, and also cause it to drain into the tiles, which then drains into the main tile and off the property. Normally, adjoining farms etc. will join their tile system into their neighbours' main tile - so that the system runs freely. Howards tiles would run under Wings Line and under SH1.

**Effect of blocked or broken tiles**

19. If they are not joined in properly together a property to have major drainage issues.

20. I confirm that if the development, or any other event, on the land receiving water from the Walsh tile system blocks the outfall in any way, the tile system will not function. It will back-up and in wet periods a portion Howard's land will become a 'bog' for each drain blocked. Evidence of poor drainage may be obvious from surface ponding or saturated topsoils.

21. Prolonged waterlogging under the surface may not be so obvious by can cause poor crop yields and grass health and high surface run-off rates and soil erosion. Stunted roots also die earlier in a drought. Runoff can contain effluent as well as sediment. Badly drained (wet) soils are more subject to damage from stock.

22. Field tiles are extremely easy to damage, particularly if it is not known where they are. Because they are clay, a posthole rammer, even large trucks can crush tiles without being aware that they have done so. This is especially older systems which may be shallower because they were hand dug. Because tiles can be crushed then effectively it blocks the system, then water will back-up.

23. I do not consider myself a sufficiently qualified expert to recommend what drainage system should be implemented. However, it is within my knowledge to confirm that if an adequate system, able to the water coming through the tiles under the road, is not put in place *prior* to heavy machinery going onto the site, then the tile system could break.

24. If the tiles are accidentally dug up, even in part, the system will backlog onto the land above it. This includes disruption both on the receiving land and if the road is dug up without care for the drainage.

25. If drain outfalls are left submerged or blocked for a long period of time, the tiles may silt up. Once this has happened it can be difficult or impossible to fix because silt backs up. The illustration below is an example of a silted drain[1].

26. It is not adequate to simply put in a drainage system designed for the downside property if it is done in a way that blocks the field tiles. Free flow from the tile system, including adequate identification of the whereabouts of the tile system, and care not to damage the tiles where they enter the downside property, would be required to prevent blockage and potential saturation of the Walsh's property.

[1] Hill K et ors.: Field Drainage Guide; Principles, Installations and Maintenance, AHDB (Agriculture and Horticulture Development Board), Warwickshire, UK

27. At a minimum I recommend prior to both developing the proposed land, AND Wings Line, a plan:

    - identifying and protecting where the system itself goes
    - committing to how to take the water safely from the tile system and
    - protecting the system itself.

**Further Illustrations to assist the Commissioner:**

1. Photograph 1 below is a photograph of my trencher.

2. Photograph 2 shows a freshly dug trench with a line of tiles being placed in it. The tiles are placed with approximately a 4 millimetre gap.

3. Photograph 3 was taken when I laid tiles recently on Mr Walsh's farm. It is a picture of Howard Walsh assisting me to insert the clay pipes for tiles into the trench and backfill. Once laid, the trench is back filled with top soil to ground level.

4. Photograph 4 shows the joint area of the tile systems where they flow into the drain. That stretch of tiles is laid through the low points of the land and all joins together to a main tile.

Signed:

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Dated: