



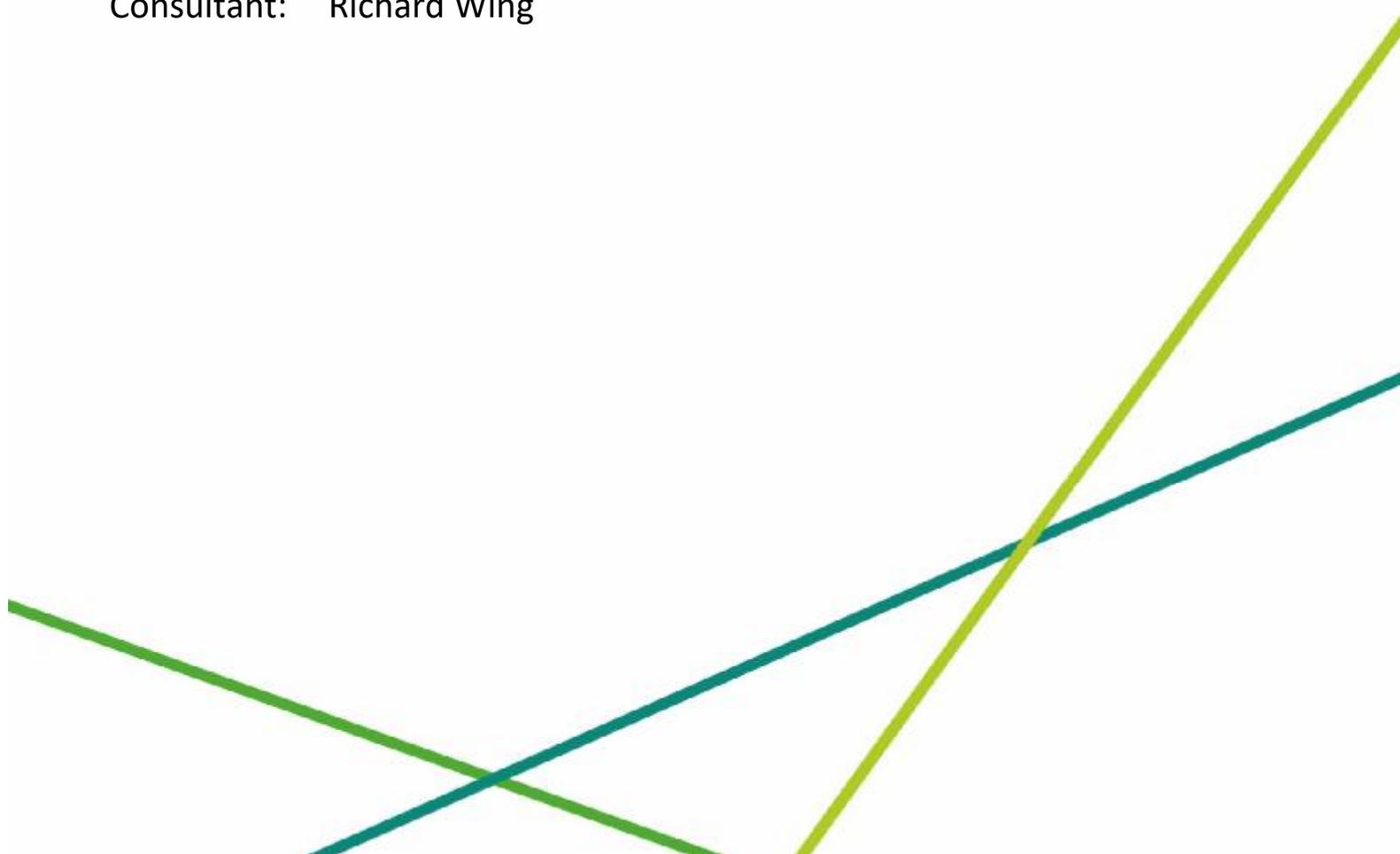
Making great sport happen



# MONIFIETH LINKS

## Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 1<sup>st</sup> November 2017  
Consultant: Richard Wing



## Omnified Links

<b>Date of Visit:</b>	Thursday 14 <sup>th</sup> September 2017
<b>Visit Objective:</b>	To review the prevailing conditions of the golf course, take further objective measurements from the indicator greens and confirm ongoing maintenance requirements.
<b>Present:</b>	Mr David Moncur – Greens Convenor Mr Scott Rennie – Course Manager Mr Richard Wing – STRI Ltd
<b>Weather:</b>	Sunny with scattered Cloud, 14°C

### Headlines

- The golf course was in excellent condition with sharp presentation eliciting positive feedback from the memberships and visitors.
- The objective data recorded on the greens was excellent with all the average readings falling within target range.
- The sward composition of most of the greens was excellent displaying a well refined blend of finer grasses with minimal populations of annual meadow-grass attributed to the well-controlled nutrition.
- Organic matter accumulations in the top 20mm have reduced but remain slightly excessive.
- The 6<sup>th</sup> green displays a weaker sward due to the higher levels of moisture retention in the soil profile.
- Traffic routes display a weaker annual meadow-grass dominant sward due to compaction.
- The woodland management has had a tremendous effect on the links characteristics of the course.

### Key Actions

- Sustain the well-balanced inputs of fertiliser to continue favouring the fine grasses in the sward.
- Maintain sand top-dressing levels to the current target to see a further slight reduction in organic matter.
- Green specific management to be carried out on greens 4 and 6 to improve the consistency of the surfaces in line with the remainder.
- Traffic routes should be overseeded using a wear tolerant dwarf ryegrass mix.
- Woodland management to now focus on 12<sup>th</sup> hole.

### Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	26.3% (range 23.5-28.9%)	15-30%
Hardness (Gravities)	103 Gravities (range 95-117)	100-140 g
Smoothness (mm/m)	15.3 mm/m	<25 mm/m
Trueness (mm/m)	6.0 mm/m	<8 mm/m
Green Speed	9 ft 9 in	9-10 ft
Organic Matter 0-20 mm (%)	6.0%	4-6%
Organic Matter 20-40 mm (%)	3.0%	<4%
Soil pH	5.6	5.0-6.0
Phosphate (P <sub>2</sub> O <sub>5</sub> )	16.4 mg/l	>10 (mg/l)
Potassium (K <sub>2</sub> O)	32.3 mg/l	>30 mg/l

Key: In Target Marginal Variance Out of Target

## Photo Observations and Comments



**Figure 1:** The medal course at Monifieth Links was in excellent condition after a busy season of play. The surfaces were well presented enhancing the natural links characteristics of the course.



**Figure 2:** The greens were well refined and the ball roll qualities of the surfaces were exceptional.



**Figure 3:** The sward composition in general is a strong blend of finer bentgrasses and fescues with limited populations of annual meadow-grass.



**Figure 4:** The soil profiles displayed a good accumulation of sand above the natural soils creating an excellent rootzone. Accumulations of organic matter were minimal in the upper profile.



**Figure 5:** Certain greens (e.g. 6<sup>th</sup> and 9<sup>th</sup>) were slightly behind the remainder of the greens in terms of sward composition due to the poorer agronomic conditions. The 9<sup>th</sup> should improve in line with the remainder following the removal of the surrounding woodland.



**Figure 6:** The tight walk-off the 4<sup>th</sup> green concentrates the traffic to the area highlighted causing a weaker sward on the green and surround and in places a loss in grass cover.

## Photo Observations and Comments (continued)



Figure 7: In general, the presentation of the tees was excellent, but worm casting was apparent on the 1<sup>st</sup> tee.



Figure 8: Close-up of the worm casting apparent on the 1<sup>st</sup> tee reducing the presentation and quality of the surface.



Figure 9: An extensive woodland management plan has been carried out over the past few years, greatly enhancing the agronomic conditions of the golf course.



Figure 10: Removal of the invasive gorse species and management of the woodland highlighted on the 12<sup>th</sup> hole would greatly enhance the aesthetics, playability and agronomic condition of the hole.



Figure 11: Traffic routes (e.g. between 17<sup>th</sup> green and 18<sup>th</sup> tee) display a higher proportion of annual meadow-grass due to the increased stress on the turf.



Figure 12: Support work carried out to the burn banks has been successful. The proposal of further reshaping is supported to reduce the man hours required in the maintenance of the turf.

## Recommendations

### Greens

- The nutritional inputs to the greens are well balanced and controlled with accurate application. The current programme is working well to favour the finer grasses and should be sustained to further improve the botanical composition of the playing surfaces. If any additional nitrogen inputs are deemed to be required they should be in the form of a liquid feed of ammonium sulphate.
- Soil pH has seen a reduction from 6 to 5.6 over the past 12 months due to the use of acidifying fertilisers. This should be monitored annually but the current acidification of the soil will favour the finer grasses in the sward.
- The organic matter content in the greens has seen a slight reduction but in general remains slightly higher than ideal. Sustain the current annual sand top-dressing at around 150 tonnes/ha to see a further slight reduction in organic matter. This should be carried out through regular light early season applications with slightly higher loads following aeration work. As and when conditions allow sustain light top-dressings through the winter to increase the year-round playing quality of the greens whilst making efforts towards the annual sand target.
- Certain greens displayed a considerable difference in firmness between the front and rear of the green (12 & 17) increasing the traffic through careful pin selection will help firm up the surfaces consistently. In addition to pin selection double rolling the softer sections of the green when carrying out rolling operations will also help.
- The overseeding of the greens with fescue is having positive results on the botanical composition of the greens and should be sustained.
- **6<sup>th</sup> Green** – with the slightly higher moisture retention on the 6<sup>th</sup> green it is more realistic to attempt to first produce a bentgrass dominant sward and then introduce populations of fescue. An overseeding using a 100% browntop bent seed mixture at 6-8g per m<sup>2</sup> through the height of the growing season, will help to improve the consistency of the sward composition throughout the weaker greens and will support the high levels of winter play, providing year-round performance.

The technique for bent overseeding should be:

- Verticut or sarel roll.
  - Broadcast seed onto surface.
  - Top-dress to cover the seed and work into the sward.
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- Additional deep aeration should be carried out on the more moisture retentive greens to help improve the structure of the soil profile. A minimum of 3 operations with an Air2G2 air injection unit will help fracture and fissure any compacted soil, improving the structure and moisture movement through the profiles.
  - **4<sup>th</sup> Green** – displays a considerably higher firmness causing a difference in the playing qualities. Additional solid tining of the surface through the season should be carried out to reduce the compaction of the upper soil profile bring the firmness towards a level consistent with the remainder of the greens.
  - Additional overseeding using browntop bent seed should be carried out into the weaker areas of turf on the green surround to increase the wear tolerance of the sward.
  - Winter traffic management precautions will be key to reducing any further stress to the turf when recovery is at its lowest.

## Tees

- In general, the presentation of the tees was excellent, however considerable earthworm activity was noted on the 1st tee reducing the aesthetic quality of the first impression of the golf course. Earthworm activity is becoming an increasing problem in the industry with the loss of the chemical control. To reduce the effects of the activity changes to the current cultural practices can be adopted:
  - The use of acidifying fertiliser (e.g. ammonium sulphate & iron sulphate) will reduce surface activity.
  - Increasing applications of sand top-dressing will not reduce activity but will reduce the effects of the activity with castings becoming sandier and easily dispersed.

## Pathways

- Areas of the course (e.g. 16<sup>th</sup> green to 17<sup>th</sup> tee) that are subject to high levels of concentrated traffic display a weaker sward dominated by annual meadow-grass. As a surface is subject to increased compaction it will develop from a fine grass sward to annual meadow-grass and eventually loss of grass cover.
- Routine surface aeration through solid tining and verti-draining should be carried out to relieve the compaction.
- As these areas are out of play and purely traffic routes, overseeding with a more wear tolerable ryegrass mix, (e.g. Bar Medal) would aid in keeping grass cover on these areas. New cultivars of ryegrass are now extremely fine and would blend well with the remainder of the surfaces.

## Burn Banking

- As in the last report, we would support the recontouring of the burn banking at the 6<sup>th</sup> and 7<sup>th</sup> hole with a look to reducing the man hour requirements in maintenance of the surface by reducing the severity of the slopes to allow a machine to carry out the required cutting.

## Tree Removal

- Tree removal should now focus on the right-hand side of the 12<sup>th</sup> hole, to improve the aesthetics off the tee, the playability of the hole and the agronomic conditions around the green by increasing the airflow to the surface.

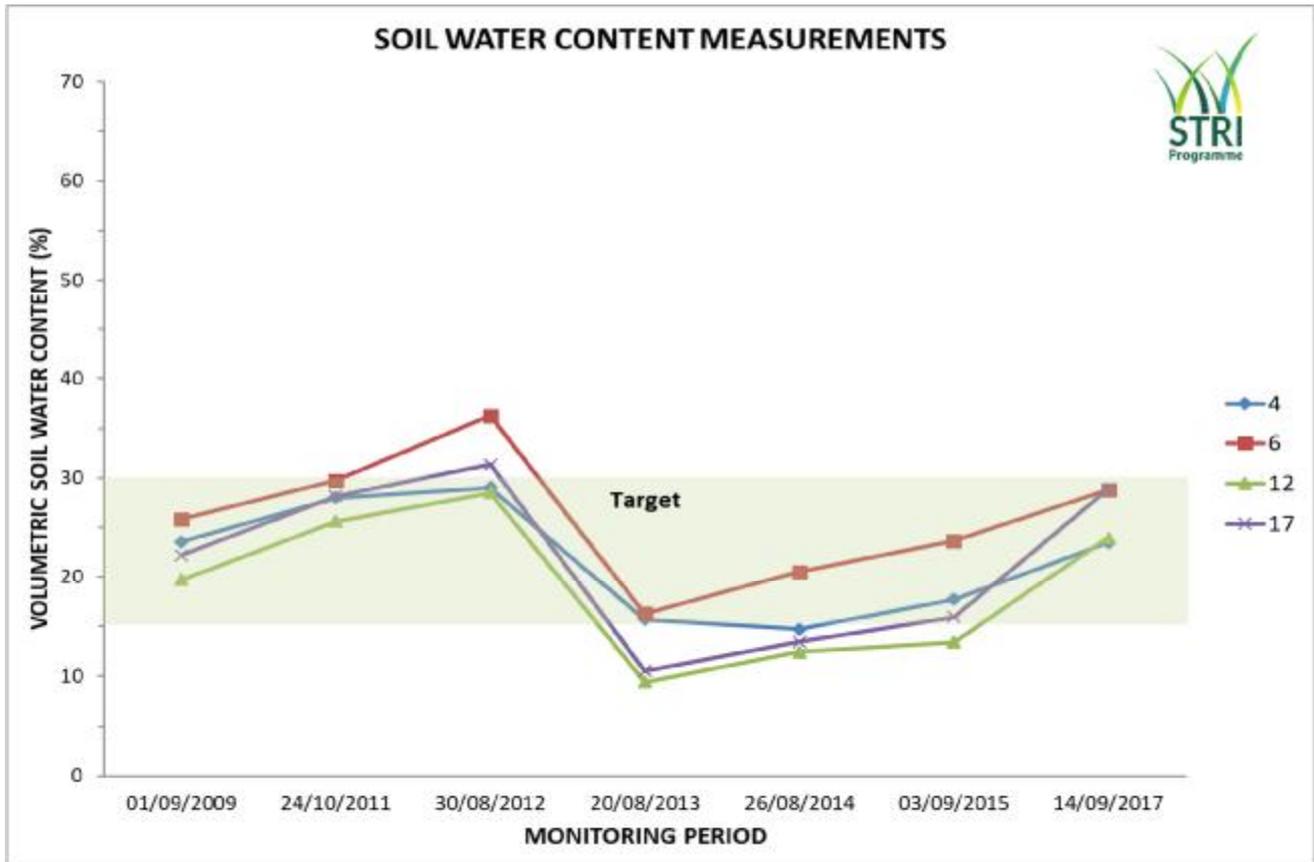
Signed

A handwritten signature in black ink, appearing to read 'Richard Wing', with a horizontal line underneath.

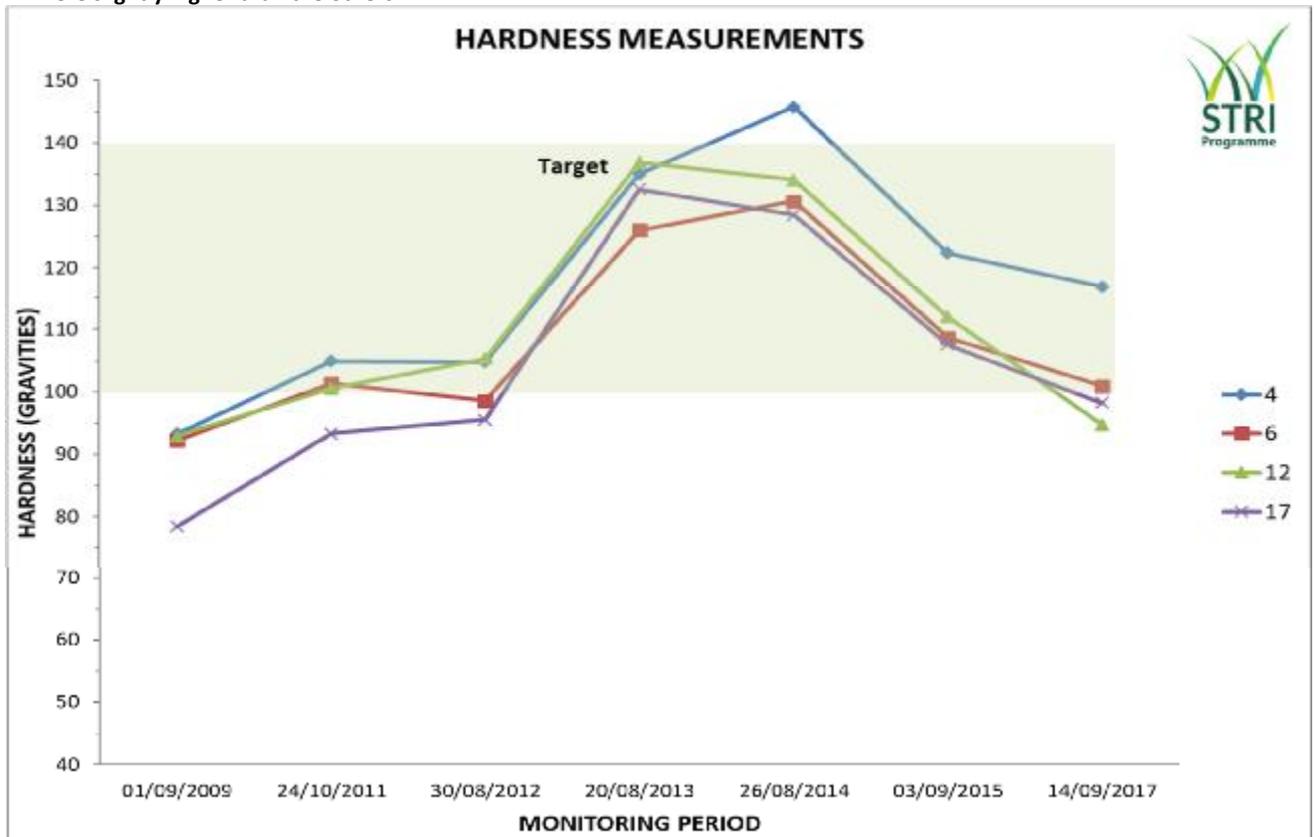
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STRI is completely independent and has no alliances to commercial products, services or contractors. This ensures that our design, project management and advisory services provide the best solutions for each individual client.

## Objective Data

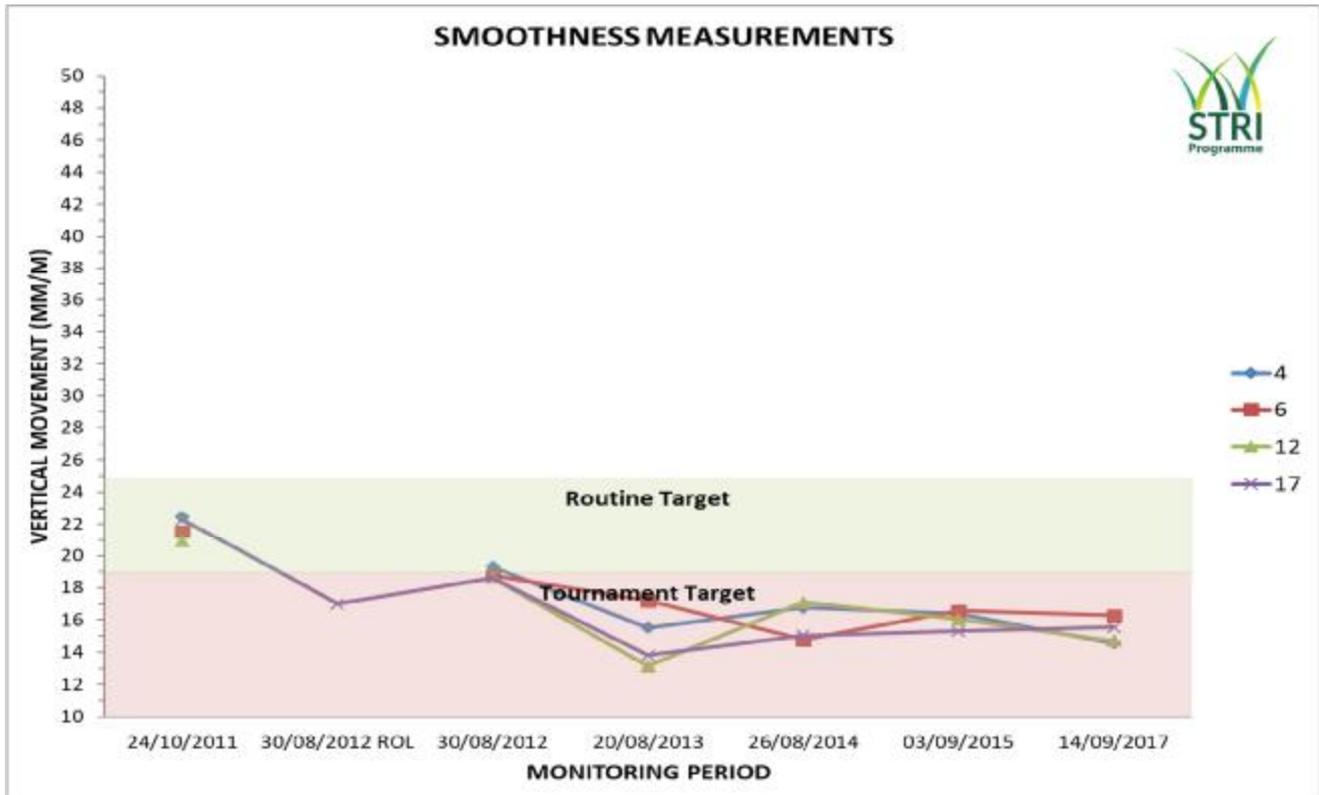


Objective Data Graph 1: Soil moisture content at an average of 26.3% was in target range for all the recorded values. Greens 6 and 17 were slightly higher than the others.

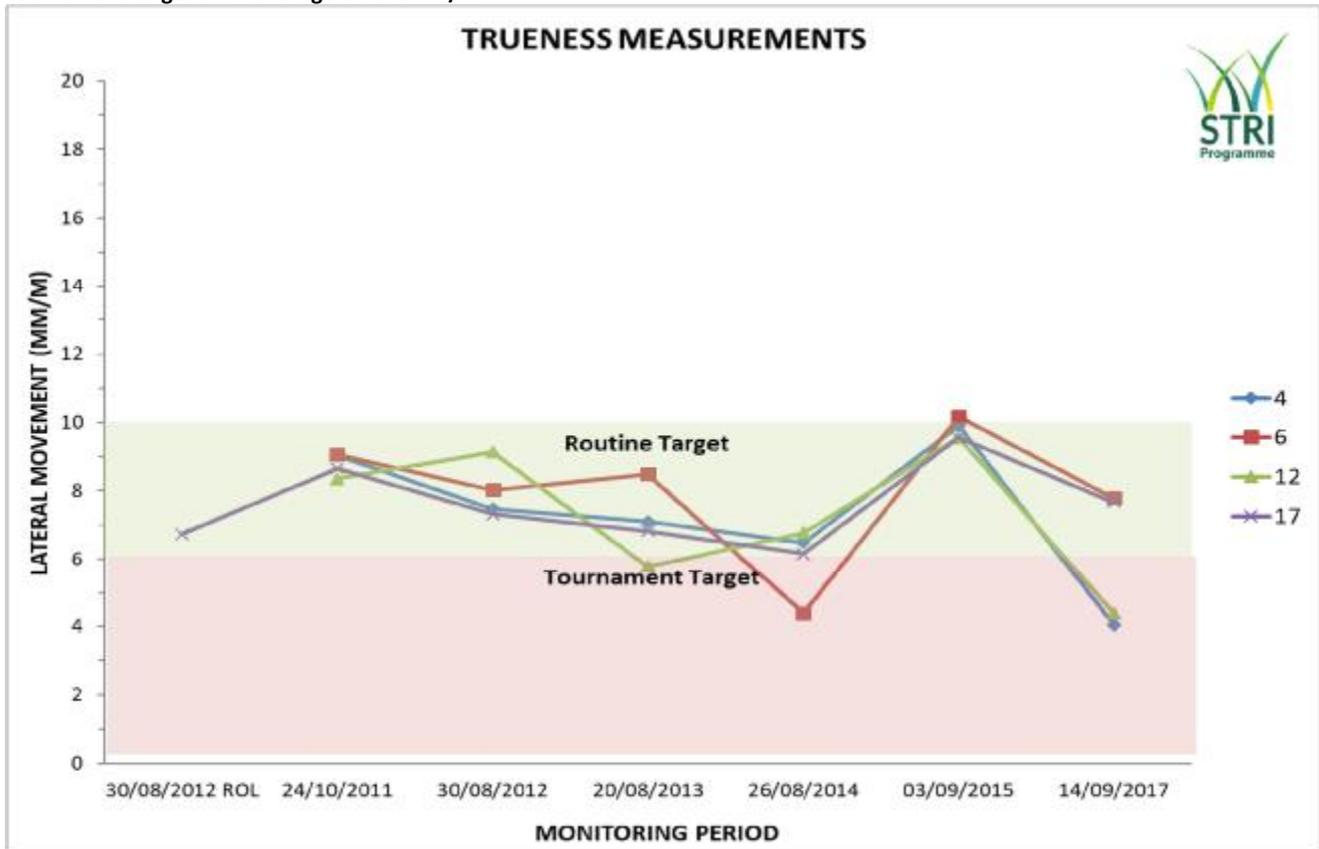


Objective Data Graph 2: The 4<sup>th</sup> green (117 Gravities) was considerably firmer than the remainder of the greens which all recorded towards the lower end of the target range. This is due to the well-controlled level of organic matter accumulation in the 4<sup>th</sup> green.

## Objective Data (continued)

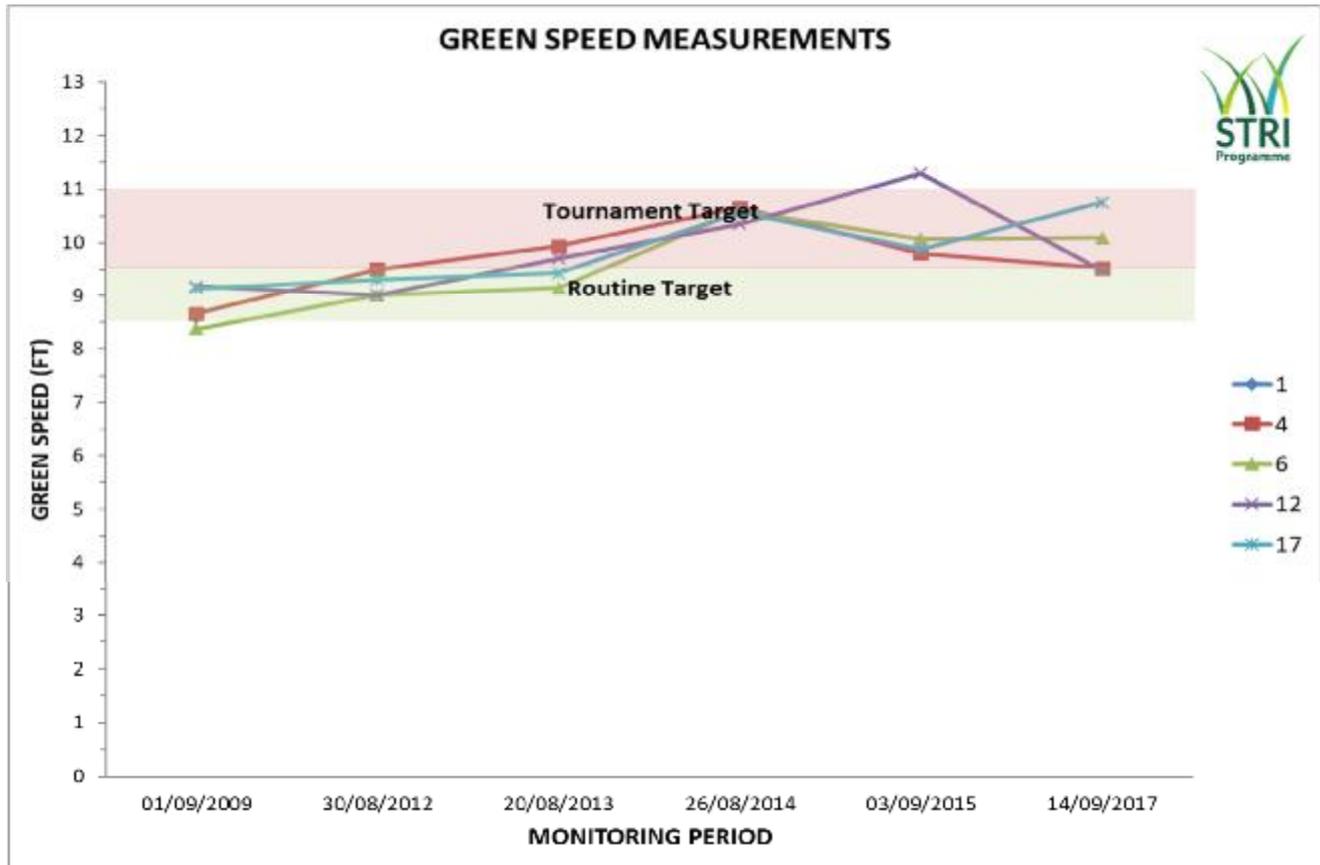


Objective Data Graph 3: Smoothness measurements following a cut and a roll were exceptional with all readings falling well within tournament target at an average of 15.3mm/m

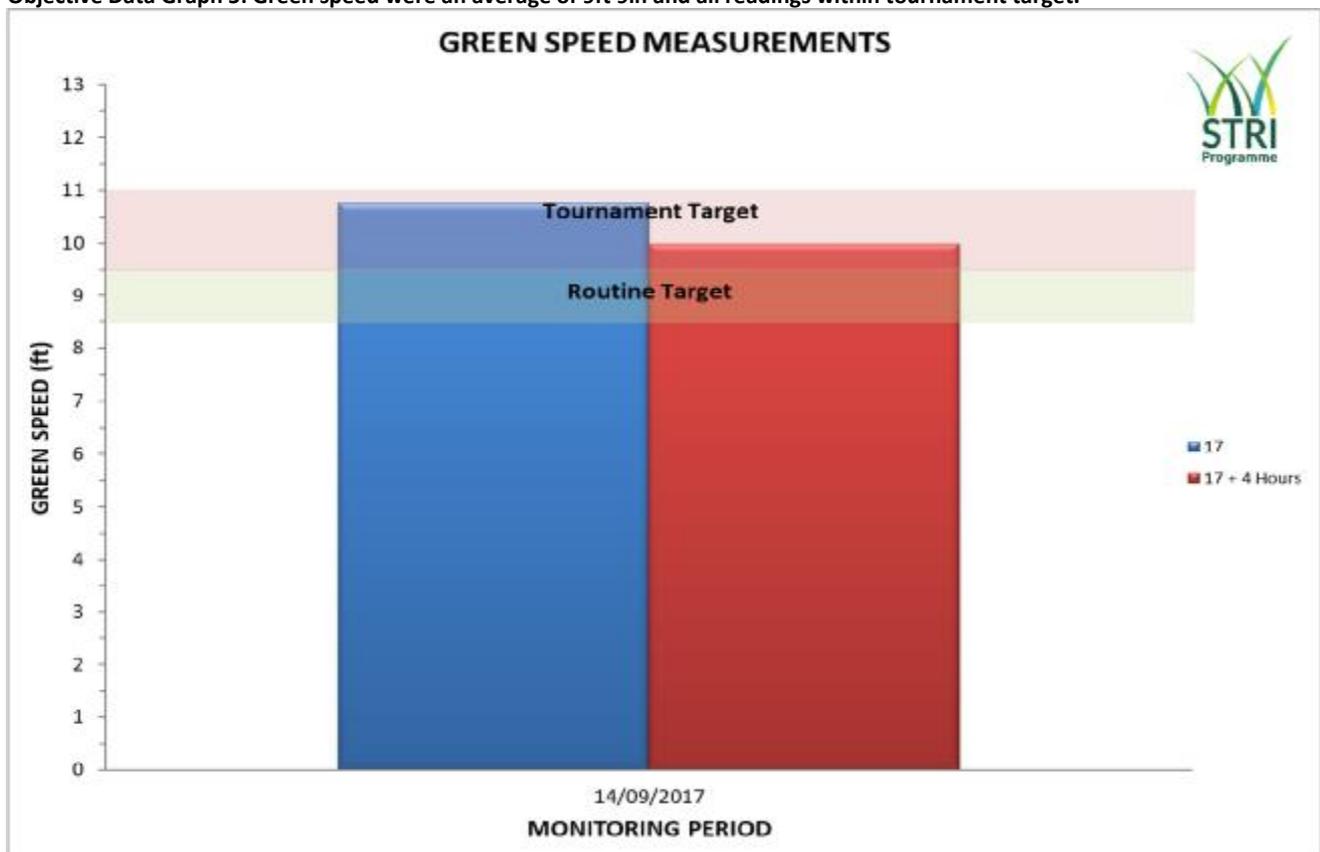


Objective Data Graph 4: The trueness measurements were all below the routine target threshold with greens 17 and 12 falling within tournament target.

## Objective Data (continued)

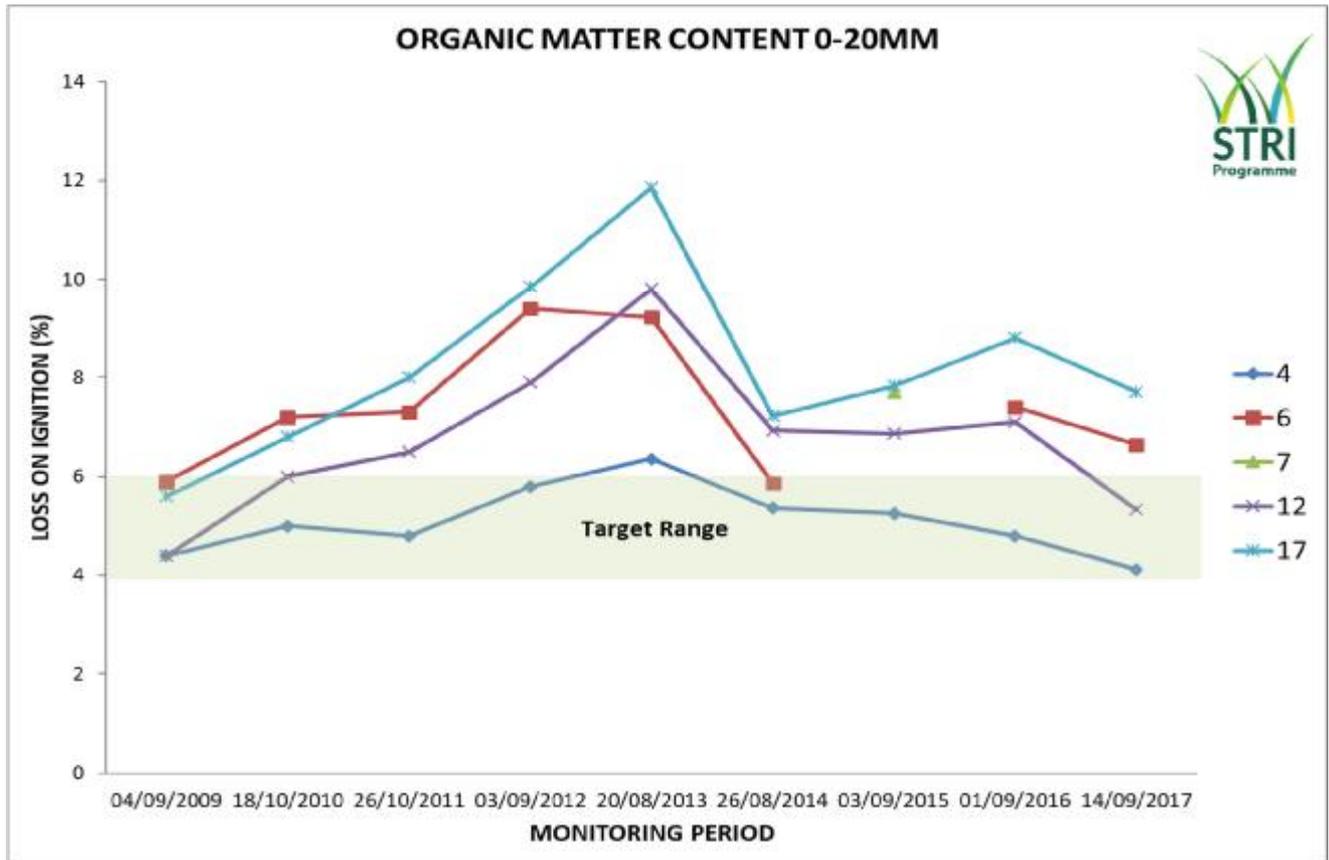


Objective Data Graph 5: Green speed were an average of 9ft 9in and all readings within tournament target.

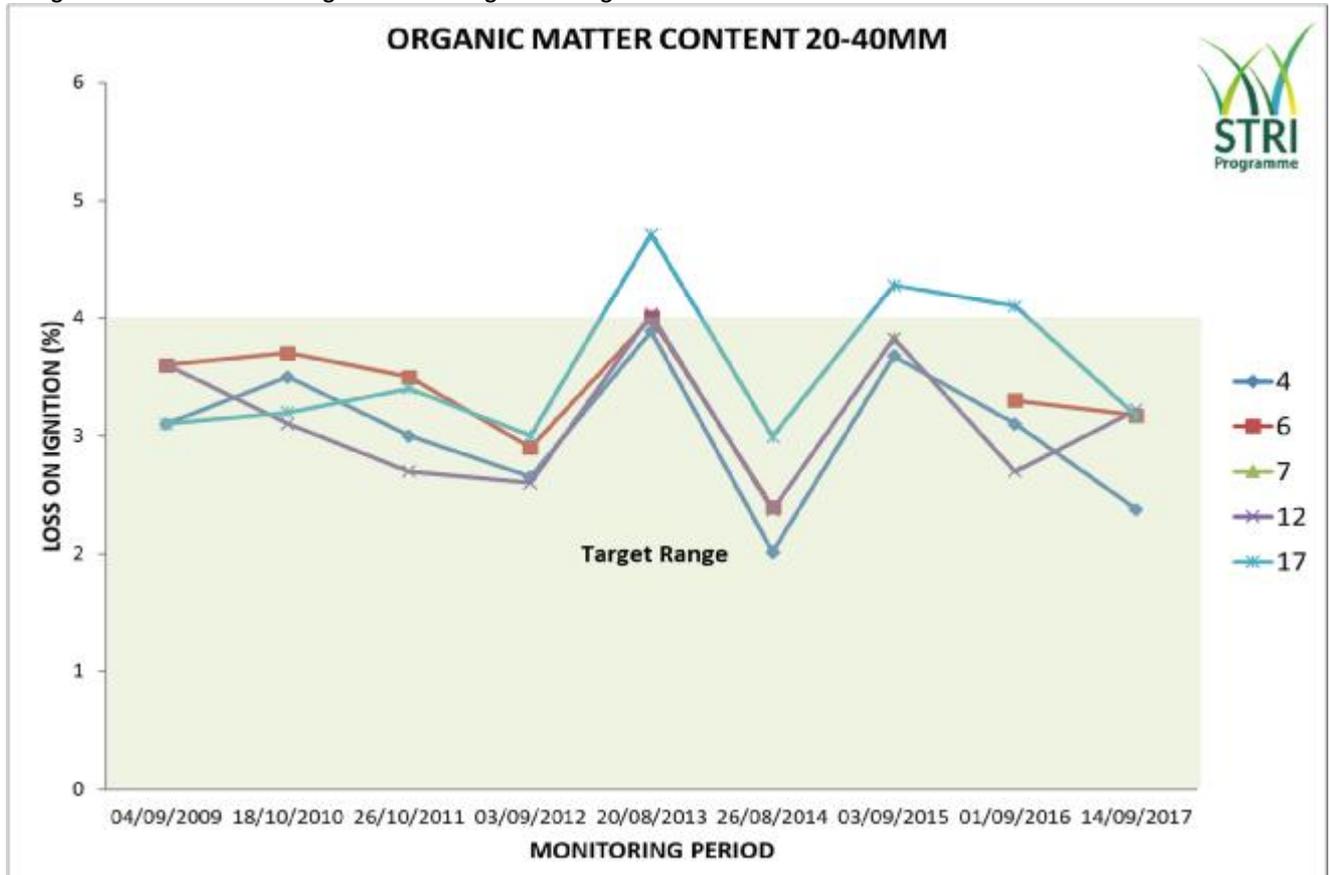


Objective Data Graph 6: The 17<sup>th</sup> green was tested immediately after the roller then again 4 hours later. A loss of almost 9 in. was recorded as the immediate effects of the roller lessened.

# Soils Laboratory Data



Soils Laboratory Graph 1: The organic matter accumulation in the top 20mm of the soil profiles remain slightly high on the 6<sup>th</sup> and 17<sup>th</sup> green with the 4<sup>th</sup> and 12<sup>th</sup> green now falling within target.



Soils Laboratory Graph 2: At an average of 3.0% the organic matter accumulation at 20-40mm of the soil profiles remains well controlled with only the 12<sup>th</sup> seeing a slight increase. This could be explained by the build up of sand in the top 20mm burying the organic matter, but no immediate action is required.



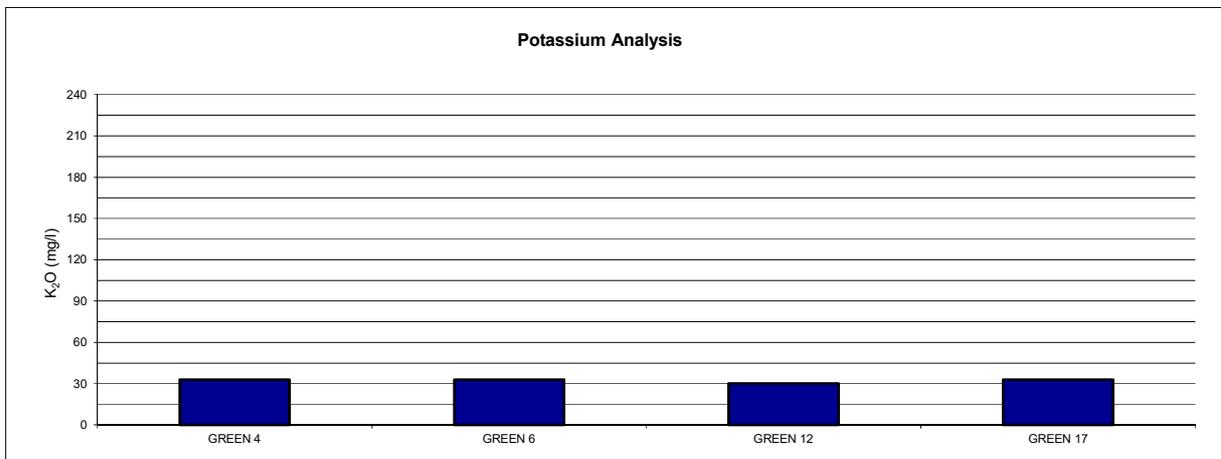
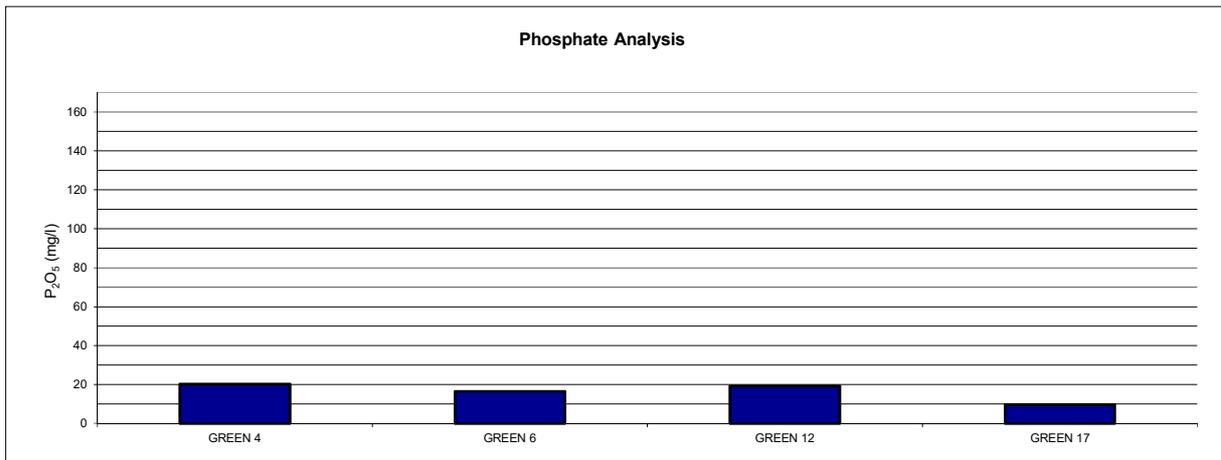
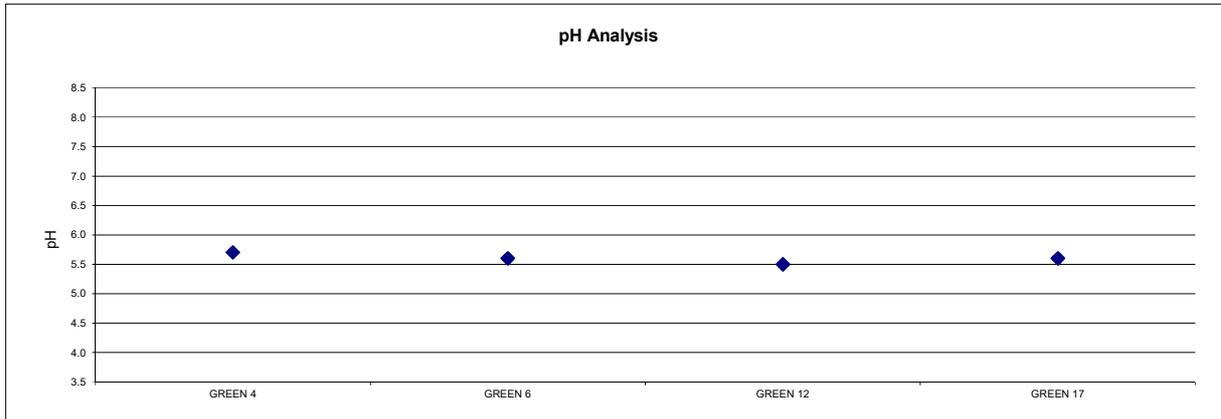
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## SOIL CHEMICAL ANALYSIS

## MONIFIETH GOLF LINKS

Date: 20/10/17



THE RESULTS PERTAIN ONLY TO THE SAMPLE(S) SUBMITTED AND TESTED.

