

**Progress goals and selected targets for N2K rivers: RECORDINGTABLE and RECORD OF DECISION.**

**RIVER SSSI (and SAC) NAME:** Test and Itchen **Completed by:** Charlotte Rose (NE) **Date:** 25/03/2014

**And** Louise Bardsley (NE) **Date** 25/03/2014

**Audit of decisions made at meetings on 25/3/2014 and 20/5/2014**

**Attendees:**

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**Natural England sign-off of consultation draft**

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**TABLE 1(a): FLOW** (Favourable Condition Targets)

PARAMETER/ELEMENT			FLOW				
			AGREED FAVOURABLE CONDITION TARGET <sup>1</sup>				
MEASUREMENT UNIT			Max% deviation from daily naturalised flow (Qn)				
SSSI NAME	SSSI UNIT/s	WB IDs	LOW FLOWS (<Qn95)	LOW-MOD FLOWS (Qn95-50)	MOD- HIGH FLOWS (Qn50-10)	HIGH FLOWS (>Qn10)	COMMENT
River Test SSSI	84	GB107042022710	CSM 5	CSM 10	CSM 15	CSM 15	SEE NOTE 3 in audit trail.
	85 -91	GB107042022700 GB107042022690 GB107042022750 GB107042016460 GB107042016840	CSM 10	CSM 15	CSM 20	CSM 10	SEE NOTE 3 in audit trail. CSM applies to the natural hydraulic limit of the tide which is approximately at SU 352 151. Flow targets in the areas that would be tidal in naturalised river are to be confirmed subject to river restoration plans *
River Itchen SSSI	103 (Upper)	GB107042016670	CSM (5) + EA RoC Site Action Plan water resource actions	CSM (10) + EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	SEE NOTE 4 in Audit trail – note also reunification into two units planned for this unit to reflect river typology changes in unit.

<sup>1</sup> i.e. The SAC (or SSSI) favourable condition target, using CSM guidance as applied in England. FCTs contain a range of other attributes and targets relevant to management planning (e.g. physical habitat targets, biological targets), but the targets here are the most critical to water quality and water resource management.

	103 (Lower)	GB107042022580	CSM (10) + EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	CSM (20) + EA RoC Site Action Plan water resource actions	CSM (10) + EA RoC Site Action Plan water resource actions	SEE NOTE4 in Audit trail
	104	GB107042016680 GB107042022590 GB107042016330 GB107042022580	CSM (10) + EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	CSM (20) + EA RoC Site Action Plan water resource actions	CSM (10) + EA RoC Site Action Plan water resource actions	SEE NOTE4 in Audit trail
	105	GB107042022620	CSM (5) + EA RoC Site Action Plan water resource actions	CSM (10) + EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	SEE NOTE 4 in Audit trail
	106	GB107042022580	CSM (10) +EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	CSM (20) + EA RoC Site Action Plan water resource actions	CSM (10) + EA RoC Site Action Plan water resource actions	SEE NOTE4 in Audit trail
	107	GB107042022730 GB107042022580	CSM (10) + EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	CSM (20) + EA RoC Site Action Plan water resource actions	CSM (10) + EA RoC Site Action Plan water resource actions	SEE NOTE 4 in Audit trail
	108	GB107042022580	CSM (10) + EA RoC Site Action Plan water resource actions	CSM (15) + EA RoC Site Action Plan water resource actions	CSM (20) + EA RoC Site Action Plan water resource actions	CSM (10) + EA RoC Site Action Plan water resource actions	SEE NOTE4 in Audit trail

**TABLE 1(b): FLOW** (RBMP2 Progress Goals)

PARAMETER/ELEMENT			FLOW				
			AGREED RBMP2 PROGRESS GOAL (MEASURE &/OR TARGET) <sup>2</sup>				
MEASUREMENT UNIT			Max% dev from daily Qn				
SSSI NAME	SSSI UNIT/s	WB IDs	LOW	LOW-MOD	MOD- HIGH	HIGH	COMMENT
River Test	<b>84</b>	GB107042022710	CSM 5	CSM 10	CSM 15	CSM 15	
River Test SSSI	<b>85-91</b>	GB107042022700 GB107042022690 GB107042022750 GB107042016460 GB107042016840	CSM 10	CSM 15	CSM 20	CSM 10	SEE NOTE 3 in audit trail. CSM applies to the natural hydraulic limit of the tide which is approximately at SU 352 151. Flow targets in the areas that would be tidal areas in naturalised river are to be confirmed subject to river restoration plans *
River Itchen	All	GB107042016670	EA RoC	EA RoC	EA RoC	EA RoC	SEE NOTE 4

<sup>2</sup> The 'progress goal' for protected area targets can be expressed in terms of the measures needed to achieve the long term target and not necessarily a numeric target (e.g. complete implementation of a Nutrient Management Plan, or complete an investigation to inform future solution). The purpose of specifying/describing an interim goal is to provide a clear direction of travel, and a useful 'milestone' to measure progress toward the ultimate achievement of long term targets which deliver N2K protected area objectives.

SSSI		GB107042016680 GB107042022590 GB107042016330 GB107042022580 GB107042022620 GB107042022730	Site Action Plan water resource actions excluding Southern Water's sustainability reductions	Site Action Plan water resource actions excluding Southern Water's sustainability reductions	Site Action Plan water resource actions excluding Southern Water's sustainability reductions	Site Action Plan water resource actions excluding Southern Water's sustainability reductions	The Sustainability reductions are excluded as their timetable for delivery is subject to uncertainty related to water resource planning.
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Consultation Draft

**TABLE 2: PHOSPHORUS AND ACIDIFICATION (Chemical attributes)** (Favourable Condition Targets & RBMP2 Progress Goals)

PARAMETER/ELEMENT			P <sup>3</sup>		ACIDIFICATION (Low alkalinity sites only) N/A to Test or Itchen		
MEASUREMENT UNIT			µg L-1		pH	ANC	
SSSI NAME	SSSI UNIT/s	WB IDs	AGREED FAVOURABLE CONDITION TARGET	AGREED RBMP2 PROGRESS GOAL(MEASURE &/OR TARGET)	AGREED FAVOURABLE CONDITION TARGET (Identify RBMP2 progress goal If necessary)	AGREED FAVOURABLE CONDITION TARGET (Identify RBMP2 progress goal If necessary)	COMMENT
<i>Itchen</i>	<b>103 (Upper)</b>	GB107042016670	20 µg L-1 (subject to results of long-term analysis of groundwater – see Note 5 – may be revised upwards)	CSM pragmatic 40 µg L-1	n/a	n/a	SEE Note 5 (audit trail) It is recommended this unit is split to more accurately reflect river typology, and therefore end up with separate goals/targets
	<b>103 (Lower)</b>	GB107042022580	CSM near natural 30 µg/l – See note 5	CSM pragmatic 50 µg/l			
	<b>104</b>	GB107042016680 GB107042022590 GB107042016330 GB107042022580	HES target 46µg L-1	55µg L-1	n/a	n/a	See Note 5. HES target is more stringent than pragmatic CSM target, but not practical for interim goal. Goal set on professional judgement of model scenario
	<b>105</b>	GB107042022620	CSM near natural 20 µg L-1 (subject to results of long-term analysis of	CSM pragmatic 40 µg L-1	n/a	n/a	SEE Note 5.

<sup>3</sup> Phosphorus - CSM guidance uses Soluble Reactive Phosphorus, which for the purposes of this guidance is equivalent to the EA determinand 'orthophosphate'. Again, judgement will be needed on when the more stringent set of P targets in Table 5 of CSMG should be applied.

			<b>groundwater – see Note 5 – may be revised upwards)</b>				
	<b>106</b>	GB107042022580	CSM near natural 30 µg L-1	CSM pragmatic 50 µg L-1	n/a	n/a	<b>See Note 5</b>
	<b>107</b>	GB107042022730 GB107042022580	CSM near natural 30 µg L-1	43 µg L-1	n/a	n/a	Growing season current value is more stringent than HES and CSM pragmatic target. See Note 5
	<b>108</b>	GB107042022580	CSM pragmatic 50 µg L-1	CSM pragmatic 50 µg L-1 <b>upstream of Chickenhall (providing significant action on Bowlake) Downstream: 74µg/l</b>	n/a	n/a	<b>See Note 5 This is based on professional judgement of scenarios.</b>
<b>Test</b>	<b>84</b>	GB107042022710	30 µg L-1 <b>subject to more investigation of groundwater quality</b>	Feasible measures to improve P concentrations are under consideration. This target will be derived once this work has concluded.	n/a	n/a	SEE Note 6  Long term target is aspirational and is set to reflect downstream targets – not the 20micrograms for the near natural table 5 which modelling suggest may be impossible to achieve on this unit.
	<b>85</b>	GB107042022700	CSM near natural 30 µg L-1	45 µg L-1 <b>(HES)</b>	n/a	n/a	Set just below the current actual to ensure action is driven. <b>achieving 46 – action on diffuse sources</b>
	<b>86</b>	GB107042022690	CSM near natural 30 µg L-1	30 µg L-1	n/a	n/a	<b>Is currently achieving near natural for this unit</b>
	<b>87</b>	GB107042022750	CSM near natural 30 µg L-1	30 µg L-1	n/a	n/a	<b>Not accounting for impacts of Fullerton and Andover STWs – as monitoring point is upstream, but downstream of this unit may be significantly impacted (200m) – the length impacted in this unit</b>

							is too small as proportion of the unit, to set for target so agreed we use current data and monitoring point.
	88	GB107042022750	CSM near natural 30 µg L-1	40 µg L-1 subject to further querying of any potential improvements at Fullerton and Andover STWs	n/a	n/a	HES allows for deterioration of water quality. Downstream of Fullerton and Andover WWTWs and goal takes these impacts into account. No more changes to WWTW planned. Modelling suggests WWTW are Dominant influence. Any decision on improvements depend on outcome of national P trials See Note 5.
	89	GB107042022750	CSM near natural 30 µg L-1	35 µg L-1	n/a	n/a	Target and goals extrapolated from units 88 and 90 due to there being no data provided for unit 89.
	90	GB107042016460	CSM near natural 30 µg L-1	35 µg L-1	n/a	n/a	Progress goal reflects close to what is being achieved in river
	91	GB107042016460 GB107042016840	CSM near natural 30 µg L-1	35 µg L-1	n/a	n/a	Progress goal reflects close to what is being achieved in river.



**TABLE 3a: ORGANIC POLLUTION (Chemical attributes) – AMMONIA** (Favourable Condition Targets & RBMP2 Progress Goals)

PARAMETER TYPE			ORGANIC DETERMINANDS				
PARAMETER/ELEMENT			Un-ionised ammonia <sup>4</sup>		Total ammonia <sup>5</sup>		
MEASUREMENT UNIT			µg NH3-N L-1 as 95%ile		µg NH4-N L-1 as 90%ile		
SSSI NAME	SSSI UNIT/s	WB IDs	AGREED FAVOURABLE CONDITION TARGET	AGREED RBMP2 PROGRESS GOAL (MEASURE &/OR TARGET)	AGREED FAVOURABLE CONDITION TARGET	AGREED RBMP2 PROGRESS GOAL (MEASURE &/OR TARGET)	COMMENT
<i>Itchen</i>	<i>all</i>	GB107042016670 GB107042016680 GB107042022590 GB107042016330 GB107042022580 GB107042022620 GB107042022730	CSM England only target 21 µg L-1	21 µg L-1	250 µg L-1	250 µg L-1	SEE NOTE 7
Test	All	GB107042022710 GB107042022700 GB107042022690 GB107042022750 GB107042016460 GB107042016840	CSM England only target 21µg L-1	21 µg L-1	250 µg L-1	250 µg L-1	No data on Total N provided for units 84 and 89.

<sup>4</sup> As there are no WFD standards for this, is not a parameter that EA routinely record.

<sup>5</sup> Total ammonia is equivalent to EA determinand 'ammoniacal nitrogen expressed as nitrogen'.

**TABLE 3b: Organic Pollution (Chemical attributes) – BOD and O2 (Favourable Condition Targets & RBMP2 Progress Goals)**

PARAMETER TYPE			ORGANIC DETERMINANDS				
PARAMETER/ELEMENT			BOD		O2		
MEASUREMENT UNIT			mg L-1 as 90%ile		% satn as 10%ile		
SSSI NAME	SSSI UNIT/s	WB IDs	AGREED FAVOURABLE CONDITION TARGET	AGREED RBMP2 PROGRESS GOAL (MEASURE &/OR TARGET)	AGREED FAVOURABLE CONDITION TARGET	AGREED RBMP2 PROGRESS GOAL (MEASURE &/OR TARGET)	COMMENT
<i>Itchen</i>	<i>all</i>	GB107042016670 GB107042016680 GB107042022590 GB107042016330 GB107042022580 GB107042022620 GB107042022730	1.5mg L-1	1.5 mg L-1	85%	85%	SEE NOTE 7
<i>Test</i>	<i>90, 91</i>	GB107042016460 GB107042016840	1.5 mg L-1	1.5 mg L-1	85% (subject to feasible improvement measures being identified).	85% (subject to feasible improvement measures being identified).	SEE NOTE 7
<i>Test</i>	<i>All remaining units</i>	GB107042022710 GB107042022700 GB107042022690 GB107042022750 GB107042016460 GB107042016840	1.5 mg L-1	1.5 mg L-1	85%	85%	SEE NOTE 7 No data on BOD provided for units 84, 85, 86, 88 and 89. No data on O2 provided for unit 89.

## **DECISION AUDIT TRAIL:**

It is important to make a jointly agreed written record of the key points and reference to any data that was material to your decision making, on the setting of long term targets, or progress goals for RBMP2s. This record should enable a colleague in future (or stakeholder) to understand how those decisions were reached. There is no prescriptive format.

This Document will be added to following the actions and subsequent meetings.

### **KEY DATA AND GUIDANCE USED ALL PARAMETERS**

- 1) Data for water quality used to assess current compliance with targets - Environment Agency water quality monitoring most recent whole year sets (2011, 2012, 2013).

Itchen water quality data spreadsheet (internal link to NE TRIM system – spreadsheet available for external parties on request):



LB 21 02 2014 EA  
Itchen WQ data revis \_

Test water quality data spreadsheet: -spreadsheet available for external parties on request

- 2) **DT Q** = Relates to Decision Tree Question numbers from - *Natural England 2014, Process and a decision tree for agreeing how targets underpinning conservation objectives for Natura 2000 rivers will be presented for consultation in RBMP2 V1.7 21.02.2014*
- 3) **CSM targets** = In all cases except unionised ammonia refer to *JNCC 2014, Common Standards Monitoring Guidance for Rivers Version January 2014*. For unionised ammonia refer to *Natural England 2014, Implementing Common Standards guidance on freshwaters in England – SSSI/ SAC River habitat features*. [http://jncc.defra.gov.uk/pdf/CSM\\_rivers\\_jan\\_14.pdf](http://jncc.defra.gov.uk/pdf/CSM_rivers_jan_14.pdf)
- 4) Evidence base underpinning CSM targets:

Natural England 2011a, An Evidence Base for setting flow targets to protect river habitat

[NERR035 edition 1](#)

Natural England 2011b, An Evidence Base for setting nutrient targets to protect river habitat.

[NERR034 edition 1](#)

- 5) Environment Agency models used for water quality assessment for all parameters.



Summary of Itchen  
CSM Simcat modelling



River Test - CSM  
SAGIS\_May 2014.xls

## NOTE 2– ALL PARAMETERS

**DT (Decision Tree) Q1** – Both Rivers Test and Itchen have attributes which correspond to WFD ecological status elements.

**DT Q2** – Both Rivers Test and Itchen have CSM attribute targets for nutrients, organic determinands and flow.

**DT Q3** - For all parameters for both Rivers Test and Itchen the site CSM (conservation objective) target for all the relevant attributes was more stringent than the targets to achieve WFD GES for the corresponding attribute. Response to DT Q5 onwards is given in the relevant target notes below.

## RIVER TYPOLOGY

Both Rivers - It was not possible to determine the CSM river typology in the meeting of 04/03/2014 as the data on flow was not available. River typology was based on flow data received on 01/04/2014 in line with CSM guidance. These river typologies will be used in assessment of P targets (as described in JNCC 2014, CSM guidance). Both rivers were assigned parameters for low altitude, high alkalinity rivers. Note some headwaters above 80m therefore CSM guidance (JNCC 2014) suggests use high altitude river targets – however river typology is based on agency WFD usage (JNCC 2014). All agreed this was not applicable and to use low altitude river targets for both catchments (Test and Itchen). Note 1/4/2014 NE senior specialist agreed the altitude cut off should not be used for upper parts of lowland rivers. It was intended for upland rivers but only one altitude limit is available at a European level.

### Itchen

Unit 103 Although flow data indicate river typology is 'river' at bottom of unit this is a headwater of the catchment, and the upper-most part of the unit would be classed as such on flows. In addition the Arle tributary which is "river" enters the unit in the lower half. To resolve this anomaly and better reflect the river typology this unit is to be split with upper section classified as headwaters and lower section a separate unit classified as 'river'. Recommend re-unitise 103 after Arle (Unit 104) confluence, in future, to bring in line with river typologies and monitoring points – suggest split upstream of SU 572 323. For tables above upstream split is referred to as 103 upper and downstream as 103 lower.

Unit 105 this unit is also headwaters. All other units are classed as 'river' based on flow statistics alone.

### Test

Unit 84 - Flow data which is recorded at the bottom of this unit would result in a classification of 'river' even though it is the unit from the source. In line with guidance from Natural England Senior Specialist this unit will remain as headwaters to protect the headwater features for both water quality and water quantity parameters.

**All other units are classed as River based on flow statistics alone.**

**NOTE 3 - FLOW RIVER TEST**

**DTQ5** – flow is only a supporting element so WFD HES for flow would not meet CSM standards.

**DT Q7** – for Unit 91 below the natural hydraulic limit of the tide (which is approximately at SU 352 151) neither HES flow targets nor CSM flow targets can be achieved by 2021 all the way down to the estuary and there is some uncertainty as to what the targets would be in a naturalised situation. Information on any geomorphological improvement potential from river restoration is also still uncertain. For all other units HES flow statistics are set at bottom of the river so do not apply, so the long term targets should be the CSM flow targets. There is no evidence currently available that suggests CSM targets are not applicable to this river. Further work may be carried out during RBMP2, subject to resource clarification. For those units that are likely to fail if necessary action can be achieved (following professional judgement) to achieve CSM flow targets these will also form the RBMP2 targets for flow. Further discussions will identify any interim RBMP2 targets for flow.

Agency sought clarification on which channel can be monitored for flow – the CSM targets assume the calculation of naturalised flow takes account of flow splits so all channels should be assessed using extant monitoring data and derivations of flow split information. The data available on flows on the Test are not in the format which the Environment Agency or Natural England can calculate compliance with CSM flow targets. For Unit 91 below the natural hydraulic tidal limit due to outstanding information and queries relating to emerging licence conditions for the large water company abstraction and lack of a clear river restoration for this part of the unit, lack of clarity around the applicability of freshwater targets to tidal sections, it was agreed that setting flow targets below the natural hydraulic tidal limit Unit 91 will await resolution of water resource and river restoration planning. All other units – the CSM guidance recommends (in the absence of locally specific data) that generic CSM targets based on typology are applied in long term. In WFD, flow targets are a supporting element, not a defining feature so flow failure will not cause failure in waterbody status. Therefore WFD flow targets do not protect flow sufficiently to meet CSM targets.

The interim RBMP2 goal may have to be refined during the plan period if assessments reveal significant flow impacts that cannot be addressed by 2021.

**NOTE 4- FLOW RIVER ITCHEN**

**DTQ5** – flow is only a supporting element so WFD HES for flow would not meet CSM standards.

**DT Q7/Q8** – for units identified as failings CSM currently (by the inference from previous Environment Agency Review of Consents work) neither HES flow targets nor CSM flow targets can be achieved by 2021 due to the need to address large water resource challenges. Until resolution of the water resource situation in Hampshire no pathway to a long term solution is known. The long term target for all units is likely to be the CSM targets with the added HOF and other actions from the EA RoC SAP (*following JNCC 2014 pg 10 "Local investigation can define additional flow targets"*). Identification of interim progress goals for 2021 is currently agreed as EA RoC SAP water resources excluding the sustainability reduction on the Southern Water licence.

EA Hands Off Flow (HOF) and other sustainability reductions proposed in the Review of Consents (RoC) Site Action Plan (SAP) are more stringent than CSM at ultra-low flows, and less stringent at low-moderate flows. These were identified by local investigation focussing on invertebrates. Interim goal could have been set as SAP under RoC excluding the Southern Water licence amendment for reasons given above. Long-term goal = CSM target + SAP target combination. Justification the data from RoC was sufficient to set a local target to protect invertebrates and is more precautionary than CSM targets at ultra-low flows. However the other elements of the interest features are protected by the CSM targets which are more stringent at low and moderate flows. Pg 10 of JNCC 2014 states that "*local hydroecological investigations can be used to refine default generic flow targets where appropriate, or to define additional flow targets*". The CSM targets protect the whole flow regime and therefore other elements of the ecosystem (see generic evidence base).

For Long-term target NE with the EA (post RBMP cycle 2 consultation) will look at the evidence for adding the (RoC SAP) HOF to the CSM targets in an amalgamated form, and EA and NE include a gap analysis to confirm that RoC and CSM cover all flow regimes (e.g. high flows, where there may be impacts from augmentation by cress farms, and which RoC did not consider).

#### **NOTE 5 – PHOSPHOROUS RIVER ITCHEN**

**DT Q5**, WFD HES standards for P will not meet the CSM P targets for either near natural and pragmatic for all units (Table 5 and 6 JNCC 2014).

**DTQ7** – Is it practicable for an attribute target more stringent than HES to be achieved by 2021? – Based on professional interpretation of modelling scenarios results (provided to NE on the 28/3/2014 and 19/5/2014 for Test and Itchen respectively) for units below Chicken hall WWTW, this is not possible. Based on assessment of model scenarios (for annual mean only as no model for growing season) interim goal will be set for all other units as CSM pragmatic if possible where this is not possible the most stringent target that can be achieved will be set for all other units – this is always more stringent than that currently being achieved.

The spreadsheet P monitoring data shows current failures against near-natural target (Table 5 in JNCC 2014) on all Itchen units. Only one unit meets Table 6 guidance. The definition of long term as a 50 year horizon and beyond was confirmed as appropriate by the NE principle specialist confirmed that 50 years is an appropriate definition for long term.

Growing season targets: EA use April – Oct as growing season for sensitive areas (eutrophication) but Test and Itchen not included in this. Initial prima facie investigation of groundwater shows high level of P in groundwater in near river sites (50% of sites [2/4] above 20µg/l (data provided on 20/5/2014). Data does not show obvious trends and is variable and limited (only four bore holes near river). There is a need to understand the response of the trends to rainfall and location in relation to headwaters/ river units. It is suspected by groundwater specialists that most of groundwater P above 0.02 mg/l are anthropogenic in origin however some minor contribution from natural marls etc in chalk. All these views require further study to confirm. There are only 10 years of EA data available on P in groundwater and the main water company in the catchment does not monitor P so long term trends are not clearly discernable. It is possible that natural contributions to P in groundwater may fail the headwater Table 5 CSM target without any surface inputs (ground water P circa 0.022mg/l headwater target 0.02) but only in limited parts of the catchment. EA groundwater specialists to undertake some analysis (subject to funding and resources) of groundwater P in Test and Itchen catchments to try to capture whether spikes are anthropogenic (and if so the source) or if there is a natural contribution also the amelioration of P in groundwater and how far across the catchment such spikes are likely to influence. This analysis is likely to occur post RBMP2 cycle consultation. If the elevations of P in groundwater are considered natural and considered widespread in the upper catchments then the long term P target for headwaters will be revised upwards to reflect any natural catchment P inputs.

EA ran SAGIS beyond all possible measures model scenarios to estimate if near natural targets are even theoretically possible if every measure (no matter how infeasible) is undertaken in the long term (circa 50 years from now). For units where even theoretical achievement of near-natural P targets appears to be impossible Table 6 (CSM guidance) targets have been chosen as long term target (e.g. Unit 108). If theoretical achievement of near-natural P is possible then professional judgement has been made of the feasibility of achieving Table 5 (near-natural) targets. In line with guidance if in long term it is theoretically possible and feasible to be returned to near natural these have become the CSM targets. The interim goal will remain the Table 6 CSM targets apart from units below large WWTW.

For Below Chickenhall STW - This CSM target and interim goal has been set on the basis that it may not be feasible to achieve near natural target even in long term, but in the next RBMP cycle, we will review measures and set more aspirational targets if new data suggests that new technologies may improve situation. 1/4/2014 Note EA Principle specialist confirmed that setting a target or goal that is between Table 5 and 6 was appropriate for units where using Table 5 targets would allow for "headroom". Units below Chickenhall are affected by the P from treatment works which is subject to an investigation in the next Asset Management Performance

(AMP) Cycle (2015-2020). Investment to resolve this technical issue will not therefore be until the following AMP (2021-2025) at the earliest. It is not therefore feasible to achieve CSM Table 6 targets by 2021 for unit downstream of this WWTW. Though the timetable is long there is a clear mechanism and pathway to resolution of this P input.

Closed-loop system implementation at watercress farms are unlikely to be entirely successful, therefore modelling scenarios which suggested no inputs from these may be ambitious. Also, reduction of 10% diffuse sources is considered ambitious (more like 5%). Therefore, SIMCAT/SAGIS modelling results may be unrealistic for interim goal/2021 RBMP. Values for this category have therefore been set higher than the modelling which the above mentioned unrealistic scenarios indicate is achievable. National P trial results will inform future revision of goals for units below the WWTW.

Discussion around having several different interim goals throughout one riverine unit to ensure action on water quality is driven— under RoC, Unit 103 had two interim goals around Stewards Bridge/downstream of fish farm. New discharge consents from watercress farms have been based on these targets. Flow data also results in anomalous typology if Unit 103 remains as entire unit (see River Typology notes). EA currently have monitoring points to cover both reaches following the split. Unit 103 = headwater = 20µg/l near natural, 40 interim. Unit 103b (split lower section) = river = 30µg/l, 50 – subject to confirmation that natural contribution of P to groundwater is higher than near-natural level.

Based on data provided in SIMCAT/SAGIS modelling, with stringent application of as many measures as possible in the available timeframe. 60µg/l is current permitted limit set by EA for watercress farms - this will take a few years to come on line and show results in water quality. Reducing the goal to 55µg/l reflects extra work required to address additional diffuse sources.

Unit 107 P – meets growing season target but not annual, therefore, set interim goal as 43µg/l. Relies on over-performance and successful trials of upstream Harestock STW and successful action on diffuse pollution, and is therefore considered ambitious,

Unit 108 – theoretical possibility of achieving 100µg/l discharge from Chickenhall STW (over-performing currently) BUT reliant on national P trials, to prove whether this is feasible. This would therefore mean that long-term target of 50µg/l could be achievable, but not in the interim. Suggest split downstream of Chickenhall to drive further action upstream, on things other than STW improvements. National P trial could give small amount of improvement, but currently unsure how much of the site will be part of the trials, so cannot say how much this could impact on water quality.

**Summary** - Due to current failure of even Table 6 targets (JNCC 2014) the interim goal for 2021 in RBMP2, is set at Table 6 levels (except units below large WWTW). Here modelling indicates it may not be feasible in long term to achieve Table 5 targets even in theory as groundwater levels already exceed 0.02mg/l in some parts of catchment and due to technological difficulty in achieving improvements in WWTW required Table 6 has been used for long term targets.

#### **NOTE 6 – PHOSPHOROUS RIVER TEST**

**DT Q5,** WFD HES standards for P will not meet the CSM P targets for either near natural or pragmatic targets for all units (Table 5 and 6 JNCC 2014).

**DTQ7** – It is unknown if it is practicable for an attribute target more stringent than HES to be achieved by 2021 - There is no specific model for the Test but Agency ran SAGIS in May 2014. EA ran SAGIS beyond all possible measures model scenarios to estimate if near natural targets are even theoretically possible if every measure (no matter how infeasible) is undertaken in the long term (circa 50 years from now). For units where even theoretical achievement of near-natural P targets appears to be impossible Table 6 (CSM guidance) targets have been chosen as long term target. If theoretical achievement of near-natural P is possible then professional judgement has been made of the feasibility of achieving Table 5 (near-natural) targets. Table 6 Targets may be achievable by 2021 as all but one unit meets these already and one unit already meets Table 5 targets. EA ran SAGIS model to assess feasibility of achieving the interim goal interim goal has been set for

all units as CSM pragmatic where this is exceeded currently (Table 6 JNCC 14). The most stringent goal that can be achieved has been set for all units that cannot achieve HES or Table 6 targets by 2021– interim goal has been set as more stringent than the level currently being achieved. Test fails near-natural on all but one unit and pragmatic target on one other unit (Table 5 and 6 JNCC 2014).

Table 5 targets are the long term target on all but Unit 84 since only one unit fails the Table 6 targets and therefore Table 6 targets would allow for deterioration of water quality in all but Unit 84. Since this unit is at the top of the catchment and upstream of other units it cannot have a less stringent long term target. Therefore the long term target for Unit 84 is set in line with the long term target for the units downstream of it.

**Interim goal:** The interim goal must not allow for deterioration of water quality so the interim goal should be as a minimum at least a little below the annual means currently being achieved. The unit 84 interim goal is set so as to allow for no deterioration but also so as to allow for no deterioration of downstream unit water quality.

Consultation Draft



**NOTE 7 - ORGANIC POLLUTION DETERMINANDS****Unionised Ammonia: River Itchen**

**Un-ionised: DTQ4 and 5** EA WFD GES/HES target only applies to TRAC waters. EA use annual mean  $0.021 \text{ mg L}^{-1}$  – CSM (England only) uses three years of data 95<sup>th</sup> percentile (England target) – CSM England only target is more precautionary than Agency target. **DTQ7**). There are no failures of unionised CSM ammonia target on the River Itchen so this target is achievable by 2021. The CSM England-only target is set for both long term and interim goal.

**Total Ammonia as N: DTQ4 and 5** EA WFD GES/HES does not meet the CSM guidance targets (JNCC 2014). There are no failures of CSM targets on the River Itchen. The CSM guidance target of  $0.25 \text{ mg L}^{-1}$  90<sup>th</sup>ile total ammonia is therefore set as long term target and interim goal.

**Unionised Ammonia: River Test**

**DTQ4 and 5 6 and 7** EA WFD GES/HES target only applies to TRAC waters. EA use annual mean  $0.021 \text{ mg L}^{-1}$  – CSM (England only) uses three years of data 95<sup>th</sup> percentile (England target) – the long term target is the CSM (England only) unionised ammonia target  $0.021 \text{ mg L}^{-1}$ . The interim goal is also likely to be  $0.021 \text{ mg L}^{-1}$  EA are concerned about the data source and query the data collection location. On this Initial review Unit 90 appears to fail unionised ammonia CSM target but believed to be an error.

**Total Ammonia as N: River Test**

**DTQ4 and 5** EA WFD GES/HES does not meet the CSM guidance targets (JNCC 2014). There are failures of total ammonia on the Test. CSM target of  $0.25 \text{ mg L}^{-1}$  90<sup>th</sup>ile total ammonia is therefore set as long term and interim goal

**Biological Oxygen Demand: River Itchen**

**DTQ Q5** EA use different metric (90<sup>th</sup> percentile) and this is not used in WFD water body assessment and therefore HES standard is not sufficient to meet the CSM metric. **DTQ 6 and 7** There are no failures of CSM target (JNCC 2014) of  $1.5 \text{ mg L}^{-1}$  as mean BOD, so there is CSM target is achievable as long term target and interim goal.

**Dissolved Oxygen: River Itchen**

**DTQ Q5** HES is not sufficiently precautionary to meet CSM targets. **DTQ6 and 7** There are two marginal failures of CSM targets on the River Itchen, but does not affect likelihood of achieving CSM target. The CSM guidance target of 10<sup>th</sup>ile DO (85% saturation) is therefore set as long term target and interim goal.

**Biological Oxygen Demand: River Test**

**DTQ Q5** EA use different metric (90<sup>th</sup> percentile) and this is not used in WFD water body assessment and therefore HES standard is not sufficient to meet the CSM metric. **DTQ 6 and 7** The CSM target (JNCC 2014) of  $1.5 \text{ mg L}^{-1}$  as mean BOD is set as the long term target. There are no BOD failures on the River Test so CSM target is set as long term target and progress goal.

**Dissolved Oxygen: River Test**

**DTQ Q5** HES is not sufficiently precautionary to meet CSM targets. **DTQ6 and 7** - the CSM guidance target of 10<sup>th</sup>ile DO (85% saturation) is therefore set as long term target on all units. DO: There are marginal failures of DO on Units 86, 90 and 91 – though all are marginal (DO all above 80%). Therefore long term target and interim goal are set as CSM target.