



# **TEST PROGRAMME INTERIM REPORT**

FOR THE CO-FIRING OF  
SOLID RECOVERED FUEL (SRF)

AT

IRISH CEMENT LIMERICK WORKS

P0029-06

**July 2023**

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## 1. EXECUTIVE SUMMARY

Irish Cement Limited (ICL) commenced co-firing of Solid Recovered Fuel (SRF) in May 2023 in its Limerick Works under the conditions of a revised IE licence and an agreed Test Programme with the EPA. The introduction of SRF as an alternative fuel, in partial substitution for traditional fossil fuel usage, is intended to reduce the fossil-based carbon emissions in the cement clinker manufacturing process and reduce reliance on unsustainable fossil fuel sources of thermal energy.

From the 30<sup>th</sup> May 2023 ICL successfully completed its initial planned stages of the test programme. The information in this report will demonstrate that full compliance with the IE licence and Test Programme requirements was maintained, as well as compliance with applicable product quality standards. This interim report covers the first 4 weeks of operation with SRF – the 30<sup>th</sup> May to the 27<sup>th</sup> June. The report covers the information requested by the Agency in condition 9 as part of the test programme approval:

- *The licensee shall submit a report within six weeks of the commencement of the test programme on the performance and monitoring of the co-incineration based on the requirements of condition 6.3.4 together with data on the 24 hour average, and 30 minute maximum values for SO<sub>x</sub>, NO<sub>x</sub>, CO, HCl, HF, TOC, and dust covering at least the first 4 weeks of the test programme.*

ICL's strategy throughout this period of the Test Programme was predicated on pursuing an orderly ramp up in SRF substitution rates in order to ensure the delivery of its dual objectives, namely (i) assuring environmental emissions compliance with IE licence and test programme conditions; and (ii) ensuring product quality consistency and compliance with applicable product quality standards.

Through an orderly ramp up approach, ICL has achieved a progressive increase in SRF addition up to the June target in the ramp up programme as approved with the EPA. ICL has successfully consumed SRF and thereby reducing the equivalent amount of waste going to landfill. ICL aim to continue to progressively ramp up the use of SRF in the Kiln as per the test programme proposal and the agreed timeline.

Throughout the Test Programme, ICL has complied with all of the conditions of its IE licence and Test Programme requirements and has maintained consistent product quality performance in accordance with applicable product standards.

Furthermore, data generated from the approved continuous monitors of multiple prescribed parameters during the Test Programmes, clearly illustrate that:

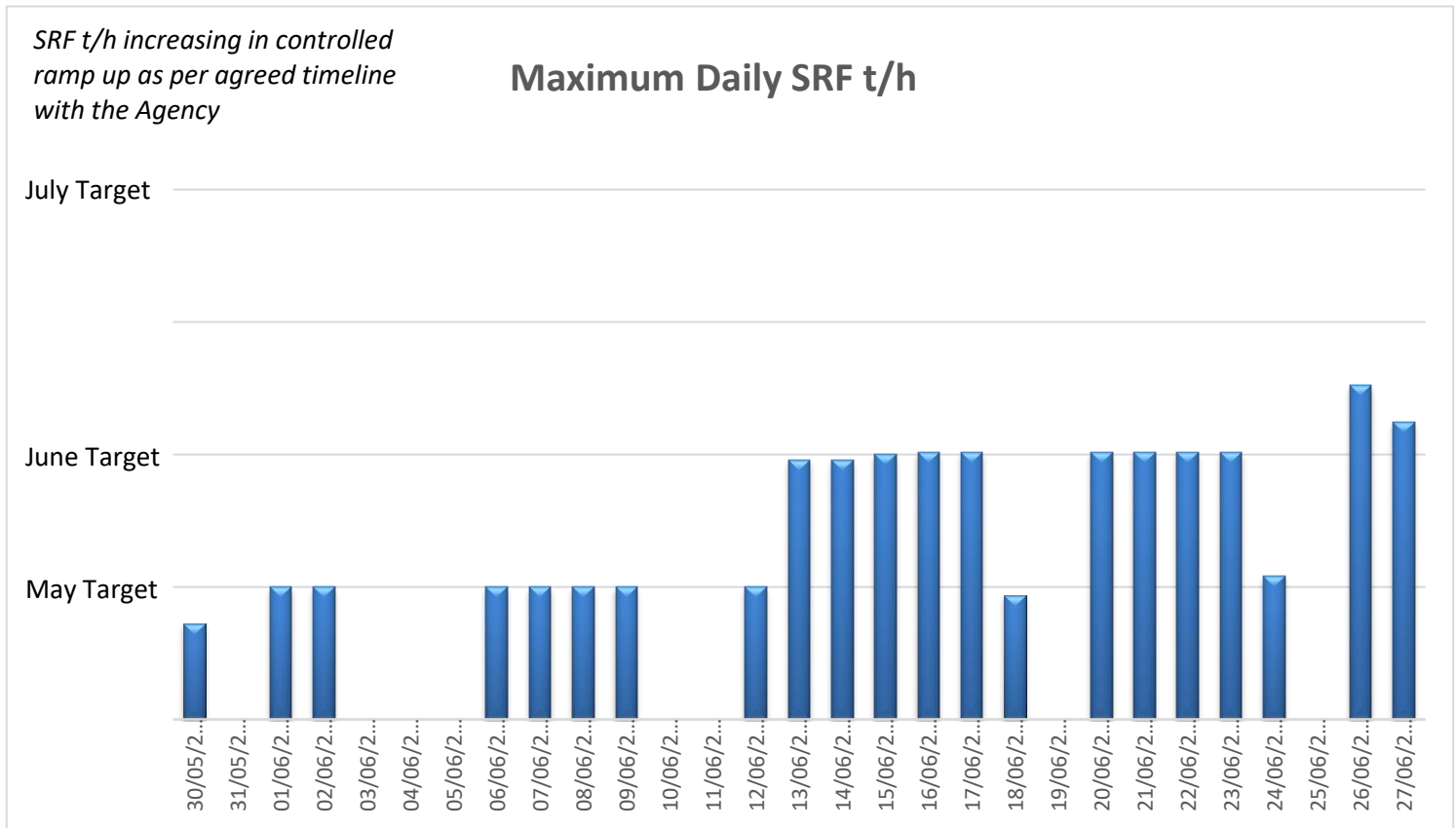
- 1. No relationship exists between SRF input rates and emission measurements; and**
- 2. Emission levels are unaffected by SRF input rates**

In conclusion, ICL believes that the information provided in this interim test programme report demonstrates that the IE licence P0029-06 as granted by the Agency contains all the necessary

operational control and emission limitations necessary to assure acceptable environmental outcomes from the operation of Limerick Works.

## 2. SRF USAGE AND EMISSION DATA

Maximum Daily SRF tonnes/hour on Kiln 6:



Average daily emission data:

	Average 24-Hour Value							
Date	Particulates	HCl	HF	NH3	SOx	CO	TOC	NOx
ELV	10	10	1	50	50	1500	25	500
	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3
30/05/2023	0.47	0.15	0.06	19.95	41.84	440.93	8.32	485.06
31/05/2023	0.49	0.08	0.06	19.82	33.66	416.17	7.65	461.36
01/06/2023	0.56	0.1	0.05	20.75	39.71	440.86	8.51	484.74
02/06/2023	0.44	0.18	0.06	20.26	43.52	457.57	8.89	480.48
03/06/2023	0.44	0.53	0.06	22.71	41.99	468.62	5.65	470.82
04/06/2023	0.47	0.4	0.06	20.87	45.64	462.85	7.1	479.22
05/06/2023	0.46	0.33	0.06	20.13	42.1	445.7	7.17	485.12
06/06/2023	0.47	0.5	0.06	20.91	42.91	451.84	7.17	483.82
07/06/2023	0.45	0.11	0.07	22.18	38.32	476.16	7.16	485.07
08/06/2023	0.45	0.46	0.07	21.69	44.71	467.07	7.71	485.24
09/06/2023	0.46	0.4	0.07	23.91	40.85	452.95	8.02	484.95
10/06/2023	0.5	1.43	0.09	22.33	41.68	430.06	8.43	485.71
11/06/2023	0.53	0.81	0.08	19.17	40.17	447.08	9.91	483.59
12/06/2023	0.52	4.09	0.07	25.61	43.2	401.22	15.08	485.14
13/06/2023	0.46	3.42	0.06	24.26	39.7	382.08	15.3	485.23
14/06/2023	0.49	2.86	0.07	25.69	42.04	390.45	16.85	484.66
15/06/2023	0.51	2.16	0.07	26.93	40.75	447.42	17.88	484.65
16/06/2023	0.51	2.18	0.09	23.61	34.21	402.12	16.19	486.45
17/06/2023	0.39	0.44	0.03	17.29	29.73	351.94	9.26	390.26
18/06/2023	0.53	0.01	0	20.59	38.29	505.93	8.57	485.44
19/06/2023	0.58	1.75	0.18	30.15	43.05	486.09	7.24	484.42
20/06/2023	0.53	2.07	0.12	30.24	41.88	513.05	6.61	487.84
21/06/2023	0.48	0.69	0.03	31.12	40.96	565.52	8.16	485.49
22/06/2023	0.51	1.86	0	31.46	37.4	570.59	7.52	486.64
23/06/2023	0.53	3.64	0.08	28.09	32.67	463.45	7.43	481.5
24/06/2023	0.55	3.16	0.1	28.6	38.58	487.04	8.03	483.81
25/06/2023	0.53	1.42	0.1	31.87	38.79	516.68	6.5	483.05
26/06/2023	0.55	1.52	0.1	36.76	41.38	517.06	4.54	485.04
27/06/2023	0.52	0.93	0.11	40.19	37.85	471.25	4.31	485.12

Max half hourly emission data:

Date	Max Half Hourly Result							
	Particulates	HCl	HF	NH3	SOx	CO	TOC	NOx
	20	20	2	100	100	3000	50	1000
ELV	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>
30/05/2023	0.72	1.3	0.11	26.58	63.73	483.22	9.09	563.38
31/05/2023	1.03	0.98	0.16	36.96	55.88	728.22	9.88	761.12
01/06/2023	2.72	1.67	0.11	25.9	57.65	493.54	9.33	544.49
02/06/2023	0.53	1.07	0.1	24.07	66.7	498.02	10.09	583.89
03/06/2023	0.54	2.59	0.11	24.48	65.34	504.61	7.84	559
04/06/2023	0.68	1.81	0.1	24.17	64.46	483.82	7.63	508.34
05/06/2023	0.51	1.67	0.1	22.45	59.2	483.34	7.85	532.48
06/06/2023	0.81	2	0.1	25.96	60.63	484.39	7.84	516.13
07/06/2023	0.51	0.56	0.15	32.96	49.05	516.34	8.16	547.58
08/06/2023	0.49	1.21	0.11	25.77	57.81	505.25	8.33	532.84
09/06/2023	0.52	1.14	0.1	28.82	56.72	495.83	8.69	532.29
10/06/2023	0.56	5.72	0.13	26.8	58.36	511.54	9.34	556.53
11/06/2023	0.58	2.14	0.13	21.85	56.5	475.42	11.37	520.77
12/06/2023	0.66	12.85	0.12	31.33	65.32	460.95	16.76	537.6
13/06/2023	0.57	4.79	0.07	29.83	47.45	424.43	16.36	524.37
14/06/2023	0.58	3.61	0.08	30.56	51.93	471.43	17.93	549.85
15/06/2023	0.57	3.17	0.09	32.64	47.77	571.81	19.55	567.49
16/06/2023	0.56	3.17	0.12	27.39	48.23	593.33	18.71	581.97
17/06/2023	0.53	3.68	0.12	28.95	59.61	645.34	16.19	539.85
18/06/2023	0.58	0.47	0.01	23.47	50.43	610.57	10.75	591.05
19/06/2023	1.23	4.48	0.34	39.87	64.61	586.13	9.34	677.56
20/06/2023	0.63	4.16	0.19	37.6	55.93	710.21	10.12	630.75
21/06/2023	0.58	1.56	0.16	38.52	49.85	742.89	10.79	604.8
22/06/2023	0.58	3.8	0.01	39.53	47.61	665.69	8.72	569.54
23/06/2023	0.57	4.91	0.11	33.46	39.26	570.51	8.24	584.06
24/06/2023	0.72	9.28	0.13	36.62	57.22	579.26	11.75	543.97
25/06/2023	0.59	4.34	0.13	34.67	67.49	567.53	8.13	535
26/06/2023	0.63	13.08	0.14	44.6	81.19	598.51	6.95	637.35
27/06/2023	0.64	5.61	0.13	54.7	84.51	816.97	10.11	552.41

### 3. CONCLUSIONS

The Test Programme period to date has successfully demonstrated that it is possible to continue to pursue SRF substitution at Limerick Works whilst complying with the conditions of IE licence P0029-06 and thus assuring environmental performance as well as maintaining compliance with all relevant product quality requirements. This report demonstrates:

- 1. Compliance of all IE licensed environmental emissions parameters;**
- 2. No relationship exists between SRF input rates and emission measurements;**
- 3. The co-firing of SRF does not result in any adverse impact on the Kiln or the associated Abatement equipment**

As such ICL proposes to continue the Test programme as approved by the agency and as per the agreed ramp up rate. ICL will continue to comply with the test programme and demonstrate compliance to the IE licence and cement product quality standards.