AQUA®©

Mining

Coal India Limited
A Maharatna Company

THE SINGARENI COLLIERIES COMPANY LIMITED
ONE FAMILY. ONE VISION. ONE MISSION
SCCL

Empowering India • Nurturing Nature • Enabling Life

Western Coalfields Limited
(A Subsidiary of Coal India Limited)

SECL
South Eastern Coalfields Ltd.

Horizontal Submerged Mine De-watering Pumpset at PSU Coal Mines

AMS

Highly Dependable, All Weather pumpsets Increase Dewatering (upto 33%) & Reduce Costs (upto 66%)

The Singareni Collieries Company Limited

Ramagundam III - OC1 & OC2 Open Cast Coal Mine

Heavy Duty; High Head;

Submerged Mine Dewatering Pumpset

The Singareni Collieries Company Limited is a Government coal mining company jointly owned by the Government of Telangana and Government of India on a 51:49 equity basis. **SCCL**, being the major coal producing company in the Southern India, has the onerous responsibility of meeting large portion of coal demand in this part of the country & been exploiting coal for more than 129 years.

RG OC-III Expansion Mine is an operating opencast mine which belongs to M/s. **SCCL**.RG OC–III Expansion Mine lies in the central part of Ramagundam coal belt of Godavari valley coal filed & at about 4km South East of Godavarikhani town. Ramagundam Opencast Project-III is one of the four opencast projects of Ramagundam region coal belt area

The area is gently undulating and sloping towards the Godavari River in northeasterly direction.

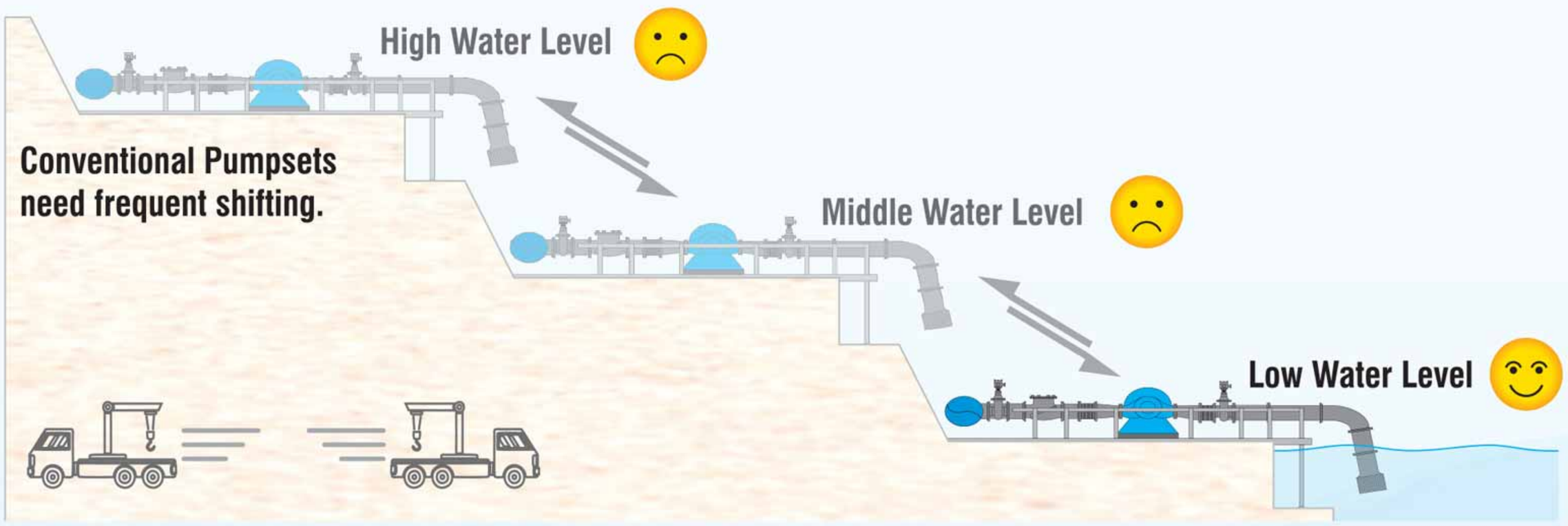
The project was planned upto 280m depth of 4 seam. Currently, the project is being worked by Dragline & Shovel dumper technology.

Situation

June to October are the rainy months. Nearly 85% of the annual rainfall is received during the south west monsoon. The average rainfall in the region is about 1340 mm. Opencast mining, especially today when mining is performed at greater depths in complex hydrogeological conditions, requires special attention of the scientific and experts community in terms of dewatering in all phases of the opencast mine development.

The presence of water in a mine has adverse effects on mine production, slope stability, safety, pollution control and therefore mining cost

Conventional pumps have a **Paradoxical Locational Constraints** – they need to be placed **As Near as Possible** *(to the water level (to have assured (water) Suction Lift))* & **yet** placed **As Far Away as Permissible** *(from water level (to be protected from the abrupt rise in water level (say due to Rains in OCM or Power Failure in UGM)))*.



Conventional pumpsets need to be Shifted Frequently leading to Loss of Working Hours, Increased Operational Manpower, Transportation Costs & increased Risk of Damage..!

Conventional Pumpsets need to be Protected from...

...Rains & High Water Level

(Submergence)

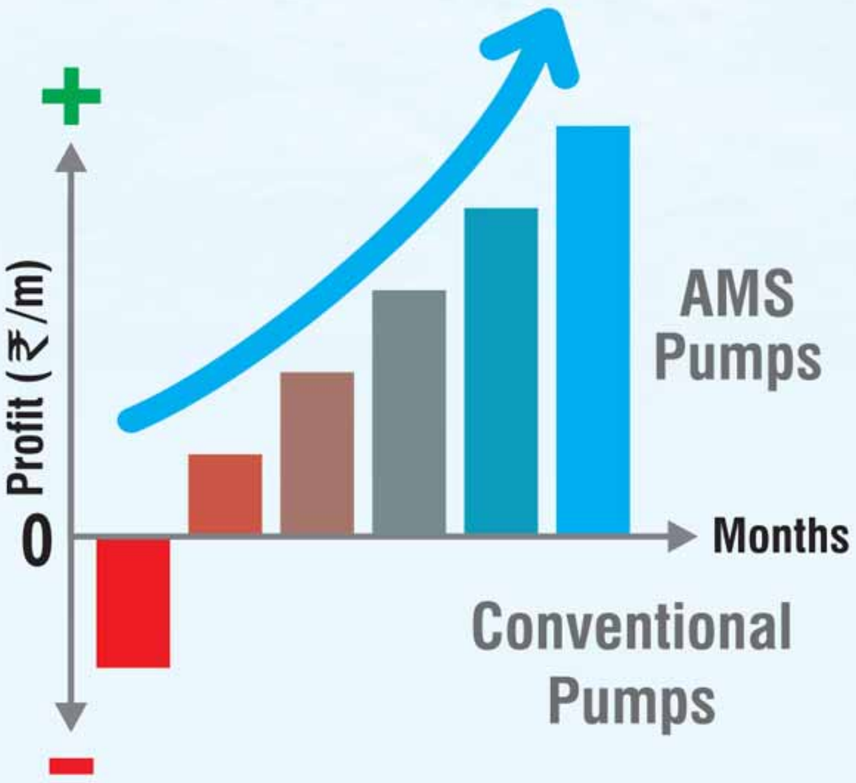
Solution

The installation of AMS pump was done immediately after supply. The Dewatering process began within a day of installation. SCCL noticed that AMS pump had a quick start and required less operating time. There was no need for routine start/stop exercises. AMS pump also eliminated the need for pre-start activities such as valve opening, priming, Gland tightening etc.

Within 2-3 months span, OC1 mines was dry out. SCCL shifted AMS pumps to OC2 Mines. SCCL observed high flow output compare to conventional Pumps.

Project : **Ramagundam III** Open Cast Coal Mine Project					
Head	**Flow**	**HP**	**Voltage**	**No. of Stage**	**Date of Commissioning**
300m	1000 IGPM ($272\ m^3/hr$)	550hp	3.3 kV	4 Stages	22nd March, 2021

Installation



THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
OCM1 STORES, RG3 AREA

Ref No RG3/OC1ST/7500045759/1909

Date: 27.11.2023

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the performance of SUBMERSIBLE MINE DEWATERING PUMP SET (550HP, 3.3KV, 1000GPM 300 MTRS HEAD) supplied to Opencast Mine No.1 by M/s Aqua Machineries Pvt Ltd., Ahmedabad against Firm Order No. 7500045759, dated 15.12.2020 is satisfactory as per Lr.No.RG3/OC-1/MGR/17/126, dated 04/07.01.202022 of Project Officer, OCM1.

This certificate is being issued at the firm's request letter No. AQUA/HO/SCCL/RGIII/ARM/2023-24/987, dated 04.11.2023.

29/11/23

GENERAL MANAGER,
RAMAGUNDAM AREA-III

Office of the Incharge OCM1 stores, RG-3
8 Incline Colony
Godavarikhani
PIN: 505 211
The S.C.Co. Ltd.

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Coal India Limited
A Maharatna Company

Western Coalfields Limited
(A Subsidiary of Coal India Limited)

Western Coalfields Limited

De-Watering of

Sethia & Chhinda OCM

Set up in 1956, m/s **Coal India Limited** *(CIL)* is an Indian Central Public Sector undertaking under the ownership of the Ministry of Coal, Government of India. Headquartered at Kolkata; it is the largest Government owned Coal Producer in the World.

It contributes around 82% to the total coal production in India & is breaking all sorts of records from its earlier production of 494.24 mT to 893 mT in FY22-23.

CIL produces coal through 7 of its wholly owned subsidiaries. These are Eastern Coalfields Limited *(ECL)*, Bharat Coking Coal Limited *(BCCL)*, Central Coalfields Limited *(CCL)*, Western Coalfields Limited *(WCL)*, South Eastern Coalfields Limited *(SECL)*, Northern Coalfield Limited *(NCL)*, & Mahanadi Coalfields Limited *(MCL)*.

Western Coalfields Limited *(WCL)* Nagpur is one of the eight Subsidiary Companies of Coal India Limited *(CIL)* & was incorporated under the Companies Act, 1956. It has been conferred **MiniRatna** status on 15th March 2007.

It has mining operation spread over the states of Maharashtra *(in Nagpur, Chandrapur & Yeotmal Districts)* & Madhya Pradesh *(in Betul and Chhindawara Districts)* & contributed about 6.7% of the national coal production during 2014–15.

The company is a major source of supplies of coal to the industries located in Western India in the States of Maharashtra, Madhya Pradesh, Gujarat & also in Southern India in the States of Andhra Pradesh, Tamil Nadu, Karnataka and Kerala.

Coal India Limited
A Maharatna Company

Situation:

Pench area have converted SETHIA mines from underground to Open Cast mines. The Sethia mine is surrounded by Pench river & has huge seepage inflows.

The Sethia OCM was unable to reduce water from open cast mines inspite of deploying one set of 1000 IGPM & one set of 2500 IGPM Conventional Centrifugal pumpsets - yet the water level was increasing the water level by 2cm to 3 cm in every 24 hours...! This was paralyzing production.

Solution:

Aqua Horizontal Monoshaft Submerged Mine Dewatering Pump				
Head	**Flow**	**HP**	**Voltage**	**Date of Installed**
150m	1850 IGPM	475 hp	3.3 kV	19th November, 2021

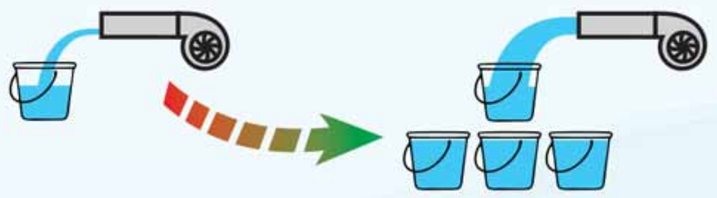
Facing an uphill task of restricting the rise of water *(which two Conventional Horizontal pumps couldn't control)*; Aqua's Horizontal MonoShaft Submerged mine dewatering AMS pumpset was called for by m/s WCL.

The AMS pumpset was installed on 19th Nov 2021 & **it not just arrested the rise of water level - it dried out the entire mine**..!

It was in operation from 19-11-2021 to 14-06-2022 without a Single Maintenance call.

Stunned with the superb performance of AMS pumpset; Authorities of Pench put up request to m/s Aqua for additional **6 months extension** to use the AMS pump by **shifting it to Chhinda mines** *(which is converted to Open Cast Mine)* & was commisioned on 5th August 2022 *(& was in operation till 20th Feb 2023)*.

At Chhinda mines, one Conventional Horizontal Centrifugal pump of **2500 IGPM** was operational which was reducing water level at the rate of $1_{cm}/24_{hr}$. By using just **1850 IGPM** AMS pumpset; Chhinda mines could reduce water level by $4_{cm}/24_{hr}$ - a staggering **FOUR fold increase i**n the rate of actual **dewatering despite having just 74% rated flow capacity....!**



Increased Cummulative Dewatered Volume *(upto **4x**)** due to much better PPLF

Due to Ultra Low Operational Hassles in AMS pumps; the AMS pumpset's **average availability was 30+ days/ month v/s just 18 to 20 days/month for Conventional Horizontal pump**. The approximate Dewatering at Chhinda mines was 201mn gallon.

The AMS pumps were operated Non Stop without a minute of rest.

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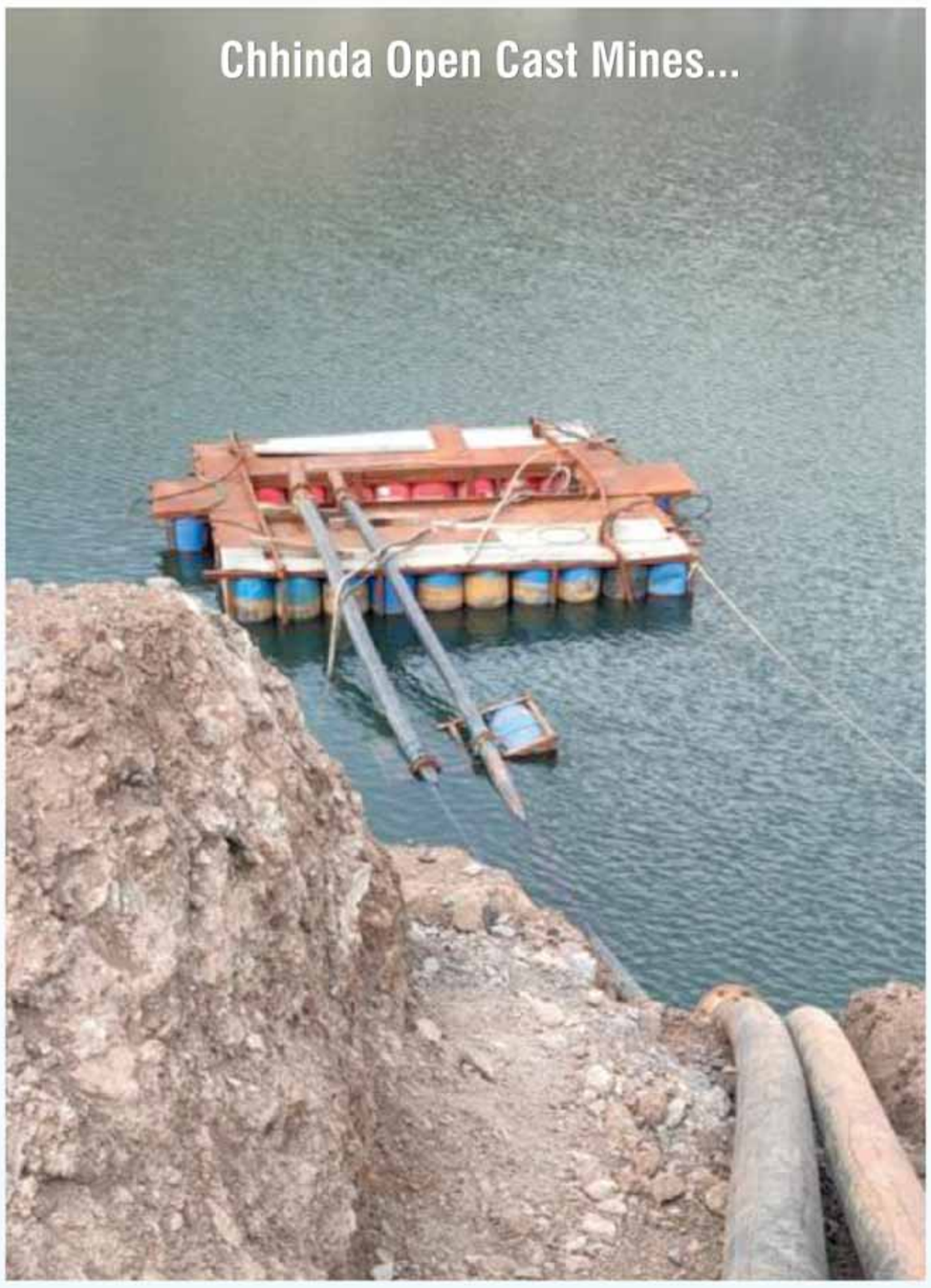

पश्चिम कोलफील्ड्स लिमिटेड
Western Coalfields Limited
(भारत सरकार का उपक्रम)
(A Govt. of India Undertaking)
OFFICE OF THE MINE MANAGER, NEW SETHIA OCM, PENCH AREA
PO. – Chhinda, Parasia, Dist. – Chhindwara(M.P), Pin - 480441
E- Mail – wclpench111@gmail.com

Ref: WCL/PENCH/RWA-CDA/SETHIA/MGR/2022/-५८१ Date: 16/09/2022

To,
S.O.(E&M),
Pench Area, WCL

Subject:- Regarding satisfactory performance of Aqua Make Submerged (Horizontal) mine pump.

Dear Sir,

The Horizontal Monoshaft submerged Mine dewatering pumpset was installed at New Sethia OCM on 19.11.2021.

- Head-150Mtrs
- Discharge -500M³/hr
- Motor rating -475HP
- Voltage -3.3KV
- Motor Speed -1500(syn)
- Panel -475HP/ATS/3.3Kv
- Make Elembica

The pump set was installed on 19.11.2021 and was in operation till 14 June 2022 at New Sethia OCM and has performed satisfactorily. The Mine water has been pumped out to satisfactory level.

The other feature of the pumpset:

1. From 19.11.2021 to 15.03.2022 the pumpset was directly installed on company provided stand.
2. In 16.03.2022 the pumpset was installed on area made pontoon.
3. The estimated water that has been pumped from 19.11.2021 to 14.06.2022 i.e withdrawal of pump is about 180Mn gallon.

The performance of this pump was satisfactory during its operation at New Sethia OCM.

Yours Faithfully
Mine Manager
New Sethia OCM

Copy to:
1. Area General Manager, Pench Area
2. Colliery Eng. New sethia OCM
3. Office Copy.
4. Aqua Machineries Pvt Ltd. Survey No.-442/2,504/1, & 504/2
   Near Haridarshan Estate, Near Express Highway,
   Ramal, Ahmedabad -382445 (Guj.)

"यह चलता है..!!"

- Er. Nirmal Kumar, **AGM, WCL**

OFFICE OF THE MINE MANAGER, NEW SETHIA OCM
WESTERN COAL FIELDS LIMITED
(A Govt. OF India Enterprise)
RWA-CDA SUB AREA, POST: CHHINDA
PARASIA, DIST: CHHINDWARA (MP), PIN:480441

Ref: WCL/PENCH/RWA-CDA/SETHIA/MGR/2023/ DATE 02/03/2023

To

S.O.(E&M),
Pench Area, WCL

Sub: Regarding satisfactory performance of Aqua Make Submerged (Horizontal) mine pump

Dear Sir,

The horizontal monoshaft submerged mine dewatering pump was installed at Chhinda OCM on 05.08.2022.The details of the pump are as follows.

- Head – 150 mtr
- Discharge – 500 m³/hr
- Motor rating – 475 HP
- Voltage – 3.3 KV
- Motor speed – 1500 rpm (synchronous)
- Panel – 475HP/ATS/3.3 KV
- Make – Aqua
- Panel make – Elembika

The pump set was installed on 05.08.2022 and was in operation till 20.02.2023 at Chhinda OCM and has performed satisfactorily. The mine water has been pumped out to satisfactory level. Month wise performance report of pump is as follows.

Month	Performance	Remark
August 22	Pump performed satisfactorily	Continuous operated without any B/D
September 22	Pump performed satisfactorily	Continuous operated without any B/D
October 22	Pump performed satisfactorily	Continuous operated without any B/D .
November 22	Pump performed satisfactorily	Continuous operated without any B/D .
December 22	Pump performed satisfactorily	Continuous operated without any B/D .
January 23	Pump performed satisfactorily	Continuous operated without any B/D .
February 23(till 20.02.23)	Pump performed satisfactorily	

The overall performance of pump was satisfactory during its operation at Chhinda OCM.

Colliery Manager
Chhinda OCM 2/3/23

Colliery Engineer
Chhinda OCM 2/3/23

Copy to:

1) Area General Manager, Pench area.
2) Office copy
3) Aqua Machineries Pvt. Ltd, Ahmedabad -382445

OFFICE OF THE MANAGER,CHHINDA OCM, RWA-CDA SUB AREA
WESTERN COAL FIELDS LIMITED
(A Govt. OF India Enterprise)
Post: Rawanwara, Parasia Dist:Chhindwara (Madhya Pradesh), Pin: 480441

NOTING SHEET

Ref: WCL/PENCH/RWA-CDA/NEWSETHIA/2023/33 Date: 29/9/23
Dealing Clerk: Name of Officer: Ch.Srikanth

To

S.O.(E&M),
Pench Area, WCL

Sub: Regarding satisfactory performance of Aqua Make Submerged (Horizontal) mine pump

Dear Sir,

The pump set was supplied by AQUA MACHINERIES (PVT. LTD) for free field trial.

The horizontal mono shaft submerged mine dewatering pump was installed at New Sethia OCM on 17.07.23 .The details of the pump are as follows.

- Head – 150 mtr
- Discharge – 500 mtr
- Motor rating – 475 HP
- Voltage – 3.3 KV
- Motor speed – 1500 rpm (synchronous)
- Panel – 475HP/ATS/3.3 KV
- Make – AQUA
- Panel make – Elembika

The pumpset was put to use at New Sethia & Chhinda OC mines. The brief details are as under:-
New Sethia mines – 18/11/2021 to 14/06/2022
Chhinda mines – August 2022 to 20.02.2023

The pump set was installed on 17.07.23 and is in operation till 30.09.2023 (till date) at New Sethiya OCM and has performed satisfactorily. The mine water has been pumped out to satisfactory level. Month wise performance report of pump is as follows.

The details of pump set are as under

Month	Performance	Remarks
July 23 (from 17/07/23)	Pump performed satisfactorily	Continuous operated without any B/D
August 23	Pump performed satisfactorily	Continuous operated without any B/D
September 23	Pump performed satisfactorily	Continuous operated without any B/D

At present the pump set is in operation at New Sethia mines

The overall performance of pump was satisfactory without any breakdown during its operation at New Sethia OCM, Chhinda OCM and again at New Sethia OCM

Colliery Manager
Chhinda OCM 29/9/23

Colliery Engineer
Chhinda OCM 29/9/23

Copy to:

1) Area General Manager, Pench area.
2) Office copy
3) Aqua Machineries Pvt. Ltd, Ahmedabad -383445

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Coal India Limited
A Maharatna Company

SECL
South Eastern Coalfields Ltd.

South Eastern Coalfields Ltd.

De-Watering of Dipka OCM, Korba

South Eastern Coalfields Limited *(SECL)* is the 2nd largest coal producing company of India. It is a **"Miniratna"** Company having its headquarters at Bilaspur, Chhattisgarh.

It owns around 92 mines spread over Chhattisgarh & Madhya Pradesh.

Coal India Limited
A Maharatna Company

SECL came into existence in 1985, when the Government of India, decided to bifurcate a part of coal mines held by WCL into new company called South Eastern Coalfields Limited, along with Central Coalfields Limited, which was bifurcated into Northern Coalfields Limited, for administrative purpose. As of 01.04.2022, the total geological coal reserve in India is 361411 mT out of which SECL's command area is 56905 mT - i.e. 15.74% of Total Coal Reserve in India.

SECL is located geologically in the Mahanadi master basin. It spreads over 6 Districts namely Korba, Raigarh, Surguja, Surajpur, Balrampur & Korea in Chhattisgarh *(C.G)* State & 3 Districts viz. Shahdol, Anuppur & Umaria Districts in Madhya Pradesh *(M.P.)*.

About 81% coal is produced by Korba coal fields comprising **Korba, Kusmunda, Dipka & Gevra.**

Situation:

Coal production is frequently affected by rains & sometimes due to unfortunate ingress of river waters - for e.g. the sudden change of course of Lilagar river flooded the Dipka coal mine forcing the stoppage of production *(as the Conventional Horizontal pump's failed)* & along with them machinery worth crores of rupees was submerged.

Solution:

Multi Stage, High Head version

With its robust design, fexible to use & smart capabilities; the AMS Horizontal, Monoshaft; Submerged Mine Dewatering pumpsets were pressed into action....

Project : **Lower Kusmunda LK1 Mine Sump**					
Head	**Flow**	**HP**	**Voltage**	**No. of Stage**	**Date of Installed**
200m	2370 GPM (640 m^3/hr)	800hp	6.6 kV	4 Stages	28th August, 2022

Coal India Limited
A Maharatna Company

Aqua was allotted this vulnerable mine after the emergency & it supplied AMS pumpset installed on Aqua make Pontoon at lower Kusmunda LK1 mine pit.

The pump set was installed late monsoon on in 2022 & was run non stop for 1300hours.

As compared to the Conventional Horizontal Centrifugal pumpsets *(rated **2974** IGPM)*; Aqua's AMS pumpset *(despite having **just 79%** flow rating; (**2370** IGPM))* **actually** dewatered an approx. **15-20% more water**...!

Increased Cummulative Dewatered Volume
*(upto **20%**)** due to much better PPLF

AMS Pump was run **Non Stop for 1300hours**.

SOUTH EASTERN COALFIELDS LIMITED
OFFICE OF THE GENERAL MANAGER
Dipka Area

Ref. – SECL/DA/E&M/Performance/2020-23/...1105 Date – 30 / 11 /2022

To,
The General Manager (E&M)/HOD
SECL, HQ, Bilaspur.

Sub : Monthly Performance of Aqua make Submerged (horizontal) dewatering mine pump with Dry type (Air filled) Motor (running on trial basis)

Dear Sir,

The " Aqua" make Submerged (horizontal) dewatering mine pump with Dry type (Air filled) Motor with Sl. No. 39284 of following specification is installed on "

1. Details of pump : Aqua make Submerged (horizontal) dewatering mine **pump ,Sl. No. - 39284**
   Head : 200 Mtrs
   Discharge : 640m3/hr (2370GPM)
   Motoe rating : 596.8 KW
   Voltage : 6.6KV
   Motor speed : 1450RPM
   Panel : HP800 / ATS /6.6 KV
   Make : Prabhu
2. Letter No. for trial run : SECL/GM/DA/22-23
3. Date of installation : 28.08.2022
4. Place of installation : Lower Kusmunda LK1 Sump
5. Performance : **Satisfactorily**
6. Present status : Running

Month	Days	W/hrs	Maint.hrs	B/D hrs.	Idle hrs.	Remarks	Performance
28.08.22 To 31.08.22	4	90	Nil	Nil	6	Power failure	**Satisfactory**
01.09.22 To 30.09.22	23	528	Nil	Nil	24	Stoppage due to failure of P.T. 200 VA from 02.09.22 to 09.09.22	**Satisfactory**
01.10.22 To 31.10.22	28	643	Nil	Nil	29	Stoppage due water lable down , pantoon shifted to deep place on dated 29.09.22	**Satisfactory**
01.11.22 To 31.11.22	6	96	Nil	Nil	Nil	Started on dated 23.11.22	**Satisfactory**
Total	61	1357	Nil	Nil	59		

The pump set was installed on 28.08.2022 and have given Satisfactory service till date. The total water discharge of water is 120 Million gallons.

The further Performance is under observation.

Yours faithfully,

General Manager (E&M)
Dipka Expansion Project

General Manager (E&M)
दीपका विस्तार परियोजना
Dipka Expansion Project

Copy to:
1. General Manager Dipka Area
2. Project Eng. DEP
3.Office Copy
4. Aqua machineries PVT Ltd. Servey No. 442/2.504/1& 504/2 near Haridaeshan State neae express highway Ramul .Ahmedabad Pin No. 382445

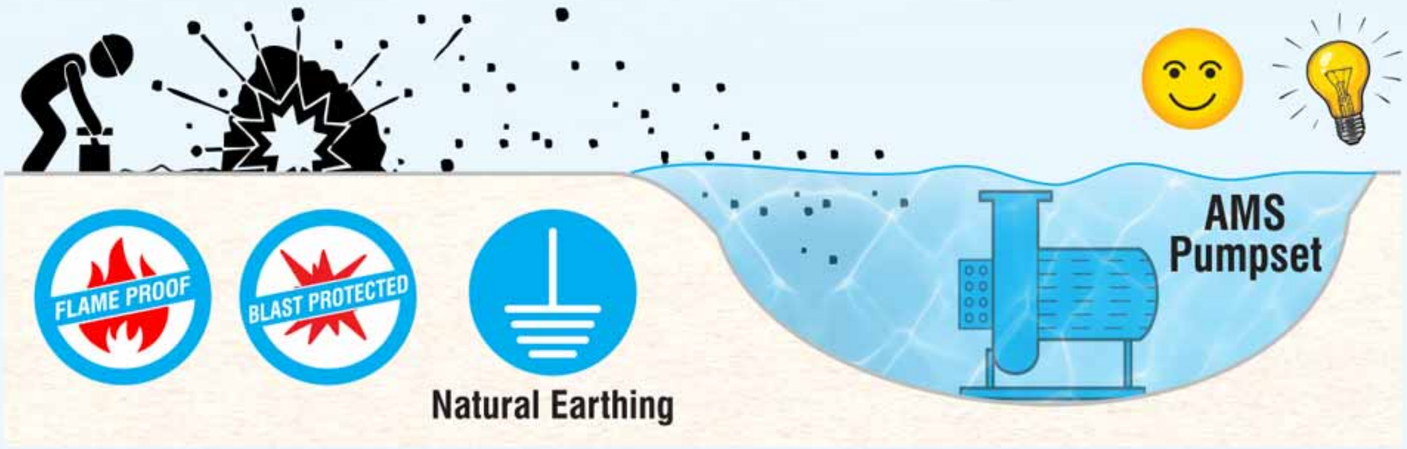
Locational Benefits of **AMS Pumps:**

Due to Operational manning during each Start-Stop & very Short Maintenance Intervals; Operators are **forced to go frequently upto** the Conventional Horizontal pumps - hence they are generally **mounted as near as possible to the waterline which necessitates frequent shifting.** ☹

But, with nearly Zero Operational Requirements & Extremely Long Maintenance Intervals; AMS pumps can be **deployed as Deep into the waters** as possible - this eliminates the need of shifting thereby enabling months & often **years of NonStop Dewatering.** ☺

Benefits of **Submerged Pumpsets :**

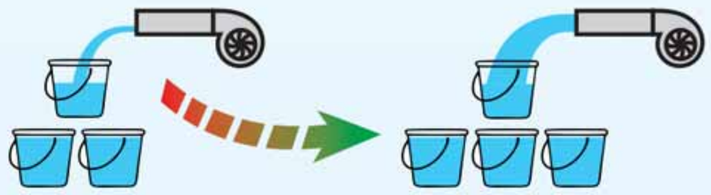
AMS Pumpset don't need Shifting for years together
& hence are available for many More Working Hours



However, in case of Submerged pumpsets; **Water absorbs** most of the **momentum** *(of such flying debris)* & hence hugely lessens the risk of damage....

Saves *(upto **85%**)* **Pump Shifting Costs***

Saves *(upto **65%**)* **of Total Costs***
(Capital + Operational (Spares+ Consumables+Manning+Handling Shifting))



Increases Cummulative Dewatered Volume

Mining

Why **AMS Pump on Pontoons...?**

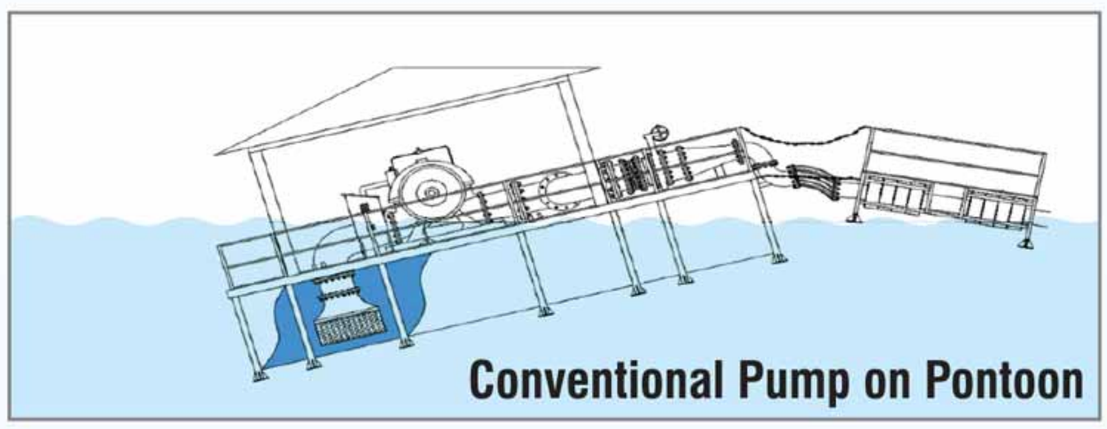
Supreme Operator Safety

Heavy duty Metallic Build

Robust, Safe & **Stable** Design meets **AS3962 - 2001** standards – **Australian Standards** Guidelines. Australian STANDARD

The centre of the structural steel frame of the pump pontoons have a **Low-Slung chassis** hence the **Pump sits below the deck** of the pontoon which lowers the **Centre of Gravity** *(CG)* & **L**ow **R**oll **C**entre *(**LRC**)* for Increased Stability.

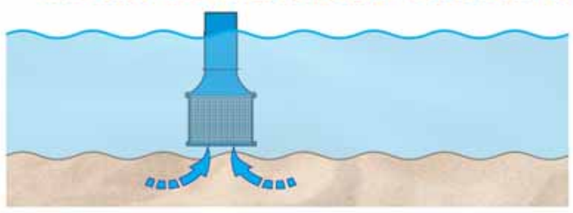
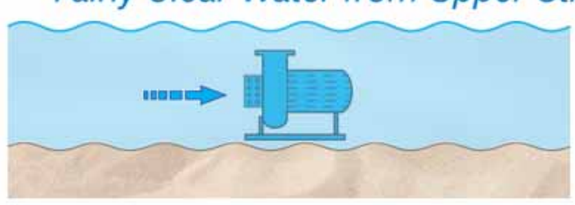
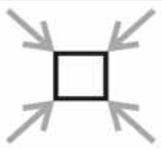
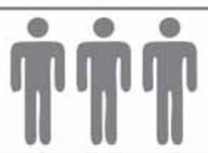
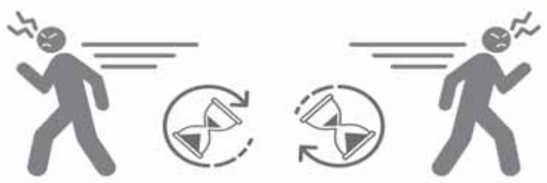
The float systems are designed & sized with minimum **1.25X FoS** *(Factor of Safety)*.



Conventional Pump on Pontoon

AMS Pump on Pontoon

Pros & Cons of Various Pontoon mounted Pumps

	Conventional Horizontal Pump	Submerged AMS Pump
Risk of **Toppling** & **Lateral Stability** due to Lower **Center of Gravity** *(CG)* & Low **Roll Center** *(LRC)*	**Above** the Deck *...leads to oscillations*  **Unstable**	**Below** Deck *...so no oscillations*  **Stable**
Direction of Pump's Inlet Suction Flow	Vertical **Bottom Facing** *...leads to Undesirable **Suction** of **Silt*** 	Horizontal **Side Facing** *...leads to Suction of Fairly Clear Water from Upper Strata.* 
Size of Pontoon	Very Bulky 	Compact 
Lubrication of Pumpsets	**Periodic** Greasing &/or Oiling is required at **1 to 2** months	**Not** required before **30 to 60** months
Installation & Operating **Manpower: Skill level** required & **Quantity**	**Highly** Skilled 	**Medium** Skilled 
Conducive to **Remote Operation**	No 	Yes 
Need for Operator to go to Pontoon Frequently *...for Priming, Alignment of Shaft/Coupling; Gland Packing Replacement / Tightening; Valve Opening / Closing; Forced Water Lubrication; Re-Oiling, Re-Greasing; Sleeve Replacement; etc.*	**Yes** 	**Not** Required. 

Aqua Machineries Private Limited

www.aquapumps.com

Registered Office & Manufacturing Plant

Survey No. 504/1-2, 442/2, Near Haridarshan Estate, Near Express Highway, Ramol, Ahmedabad-382 445. Gujarat, India.

marketing@aquapumps.com